

A revision of the tribe *Aspidimorphini* of the Oriental Region
(*Coleoptera: Chrysomelidae: Cassidinae*)

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ABSTRACT. Oriental species of the tribe *Aspidimorphini* are revised, keyed, and figured. The tribe comprises 80 species in the Oriental Region in 4 genera. A new subgenus *Sindiolina* is proposed for *Cassida sedecimmaculata* BOHEMAN, 1856. The following new species are described: *Aspidimorpha bataviana* (Indonesia), *A. intermedia* (Philippines), *A. luzonica* (Philippines), *A. snizeki* (S China), *A. sulawesica* (Sulawesi), *A. tamdaoensis* (N Vietnam), *A. timorensis* (Timor), *Lacoptera cheni* (S China), *L. depressa* (India), and *L. meghalayaensis* (India). Three new synonyms are proposed: *Aspidimorpha indica* BOHEMAN, 1854 = *A. sumatrana* SPAETH, 1904, *Lacoptera fallax* WEISE, 1910 = *L. timorensis* SPAETH, 1926, and *L. sedecimnotata sedecimnotata* BOHEMAN, 1862 = *L. s. sumbae* HINCKS, 1953. *Aspidimorpha inquinata musta* SPAETH, 1914 is raised to the species rank. The degree of endemism is high, 77 out of 80 species are endemic, and only three shared with the Australian Region. Two species, *A. difformis* and *A. transparrispennis*, are distributed in the border area between Palearctic and Oriental regions with greatest part of their range in eastern Palearctics.

Key words: entomology, taxonomy, zoogeography, revision, *Coleoptera, Chrysomelidae, Cassidinae, Aspidimorphini*, Oriental Region.

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INTRODUCTION

The tribe *Aspidimorphini* was proposed by CHAPUIS (1875) as a group "*Aspidimorphites*" within the tribe *Cassidini*, for all genera with the tarsal claws pectinate on the inner margin or both the inner and outer margins. SPAETH (1942) separated the New World genera with pectinate claws as *Charidotitae*. Finally, in a posthumous paper of SPAETH, edited by HINCKS (1952), the *Cassidinae* with pectinate claws were subdivided into two tribes: *Aspidomorphini* (change of name stem from *Aspidimo-* to *Aspidomo-* based on an unjustified emendation by AGASSIZ 1848) for the Old World genera, and *Charidotini* for the New World genera. This subdivision was accepted by most later authors, only RILEY (1986) questioned the separation of the tribe *Charidotini* on the ground of the types of claws found within the specialized genera of *Cassidinae* in the New World. According to him, the occurrence of pectens on the claws is only the matter of character expression. Although tarsal claws are micropectinate in many genera of the tribe *Cassidini*, their pecten is small, poorly developed, and visible only after the removal of claw and its preparation. RILEY (1986) synonymized the tribe *Charidotini* with the tribe *Cassidini*. Because of the lack of materials to study he did not discuss the genera from the Old World tribe *Aspidimorphini*. The problem was taken up by BOROWIEC (1995) in his tribal classification of the *Cassidinae*. He agrees with RILEY that the separation of the tribe *Aspidimorphini* with only one synapomorphic character (of homoplastic type) is inappropriate. Consequently, BOROWIEC (1995) synonymized the tribe *Aspidimorphini* with the tribe *Cassidini*. As a result, the subdivision of *Cassidinae* into tribes has become very asymmetric, with more than a half of species and genera placed in the tribe *Cassidini*.

The genera previously placed in the tribe *Aspidimorphini* represent undoubtedly the most specialised line in the evolution of *Cassidinae*. The specialisation is expressed not only in the development of claw pectens but also in the strongly depressed, extremely cassidoid body, uniformization of morphological characters to the plesiomorphic states of the entire subfamily, uniformization of the male genitalia reduced to a tube of aedeagus, without distinct internal sclerites, and uniformization of the spermatheca reduced to the spermathecal capsule of the same type in all species, without the ampulla, and often without the complex ductus (in many species the spermatheca is weakly sclerotized and difficult to prepare by standard methods). Bionomics of the *Aspidimorphini* is also uniform, with most species feeding on the *Convolvulaceae*, and only a few species feeding on the *Solanaceae* (these two plant families are very close biochemically and represent a sister groups). The larvae of the *Aspidimorphini* represent an extreme cassidoid appearance, with strongly developed lateral processes on the body sides and long furci on the last abdominal segment. In spite of a distinct paraphyletic character, rejected radical cladistic point of view, the Old World genera with pectinate claw are treated here as an advanced group at the level of the tribe, in traditional sense proposed by SPAETH (HINCKS 1952). The problem of subdivision such a large group as the *Cassidini sensu lato* is still open to question, especially

because the bionomics of most species is unknown and phylogenetic relationships between various evolutionary lines in the Old and New World are unclear. Without doubts, the same apomorphic characters, such as the antennal grooves, filiform antennae, carinate labrum, pectinate claws, deep clypeal grooves evolved independently in the New and Old World genera. Evolution of those beetles has been under the pressure to adaptation to various host plants, while their morphological evolution was characterized by many reductions rather than evolving special characters. As a result, the derived *Cassidinae* are morphologically the most generalized chrysomelid beetles, and thus very difficult to classify using standard cladistic methods.

MATERIALS AND METHODS

The materials include all available primary and secondary types of Oriental taxa from the tribe *Aspidimorphini*, which were borrowed from 17 museum and private collections, and approximately 15000 specimens from identified and unidentified materials of the following collections (collections with type materials in bold):

Institutions:

- **Academia Sinica, Beijing, China;**
- Bishop Museum, Honolulu, USA;
- **British Museum, Natural History, London, England;**
- **California Academy of Sciences, San Francisco, USA;**
- **Department of Zoology, Modern College, Pune Univeristy, Pune, India;**
- Field Museum of Natural History, Chicago, USA;
- Hungarian Natural History Museum, Budapest, Hungary;
- Institut Royal des Sciences Naturelles, Brussels, Belgium;
- Instytut Systematyki i Ewolucji Zwierząt PAN, Kraków, Poland;
- **Instituut voor Taxonomische Zoologie, Amsterdam, The Netherlands;**
- **Manchester Museum, Manchester, England;**
- **Museo Civico di Storia Naturale, Genova, Italy;**
- Museo Civico di Storia Naturale, Verona, Italy;
- Museo Zoologico de "La Specola", Firenze, Italy;
- Muséum d'Histoire Naturelle, Geneve, Switzerland;
- **Museum für Naturkunde, Berlin, Germany;**
- **Museum für Tierkunde, Dresden, Germany;**
- Museum Aleksander Koenig, Bonn, Germany;
- **Museum National d'Histoire Naturelle, Paris, France;**
- **Museum of Comparative Zoology, Harvard University, Cambridge, USA;**
- **Muzeum i Instytut Zoologii PAN, Warszawa, Poland;**
- Narodni Muzeum, Prague, Czech Republic;
- National Collection of Insects, Ottawa, Canada;

- Naturhistorisches Museum Basel, Bazylea, Switzerland;
- **Naturhistoriska Riksmuseet, Stockholm, Sweden.**
- Naturkundemuseum Erfurt, Erfurt, Germany;
- Peabody Museum of Natural History, Yale University, New Haven, USA;
- Snow Entomological Museum, Lawrence, USA;
- **Staatliches Museum für Naturkunde, Stuttgart, Germany;**
- United States National Museum, Washington, USA;
- Universiti Kebangsaan, Selangor, Maaysia;
- **Zoological Museum, Helsinki University, Helsinki, Finland;**
- Zoological Museum, Lund University, Lund, Sweden;
- Zoologische Staatssammlung, München, Germany;
- **Zoologisk Museum, Copenhagen, Danmark.**

Private collections:

- U. ARNOLD, Berlin, Germany;
- **J. Bezděk, Brno, Czech Republic;**
- B. BORDY, Faverney, France;
- **L. BOROWIEC, Wrocław, Poland;**
- M. DOEBERL, Seeweg, Germany;
- S. DOGUET, Fontenay sous Bois, France;
- F. FRITZLAR, Jena, Germany;
- U. HEINIG, Berlin, Germany;
- P. HOSEK, Prague, Czech Republic;
- **F. KANTNER, Lipi n. České Budejovice, Czech Republic;**
- Y. KOMIYA, Tokyo, Japan;
- M. LANGER, Lichtenwalde, Germany;
- M. OUDA, Plasy, Czech Republic;
- R. REGALIN, Milano, Italy;
- R. RÖBER, Hasselby, Sweden;
- **D. SASSI, Castelmarte, Italy;**
- **M. SNIŽEK, České Budějovice, Czech Republic;**
- S. ZOIA, Milano, Italy.

Faunistic data were published by BOROWIEC (1985, 1990 a, 1996, 2001) in a series of papers on the Oriental *Cassidinae*. A summary of distribution data for each species is illustrated in detailed maps in the present paper.

The beetles have been examined by standard methods of comparative morphology. Each species has been illustrated by a series of drawings of morphological details and showing the variability of their dorsal pattern. If a male was available the aedeagus has also been examined. A predominant opinion among the students of *Cassidinae* that male genitalia are very uniform and do not offer diagnostic characters. It is true, the aedeagi of many specialised *Cassidinae* are

very uniform in comparison with other subfamilies of *Chrysomelidae*. However, they show some differences, which make it possible to subdivide genera into species groups. Many important differences at the species level are found in the structure of the inner sack in erection. Unfortunately, the method of its eversion is very complex and difficult to use in old, dried specimens, and was forgone in my work. I have prepared the spermatheca for several species, but in most species the spermathecal capsule is uniform, weakly sclerotized, without the ampulla, and does not offer diagnostic characters, with the spermathecal duct very uniform. Thus, spermathecae were not illustrated. The length ratio of antennal segments are based on the means measured for 30 specimens, or all available specimens if the total was less than 30. For species with sexually dimorphic antennae only those of males were measured.

Members of the tribe *Aspidimorphini* are usually uniform, and some species differ in subtle characters. On the other hand many species are very variable in their structure and coloration. But in some cases a proper identification is possible only by the comparison of examined material with a series of properly identified specimens. A geographic distribution in many cases is a good additional discriminating character, especially for similar but vicariant species. The other problem is the possibility to crossing within some groups of species e.g. *Aspidimorpha sanctaerucis* and its relatives. In the examined materials, all intermediate specimens are females, often without the spermatheca, which suggests their sterility or parthogenesis.

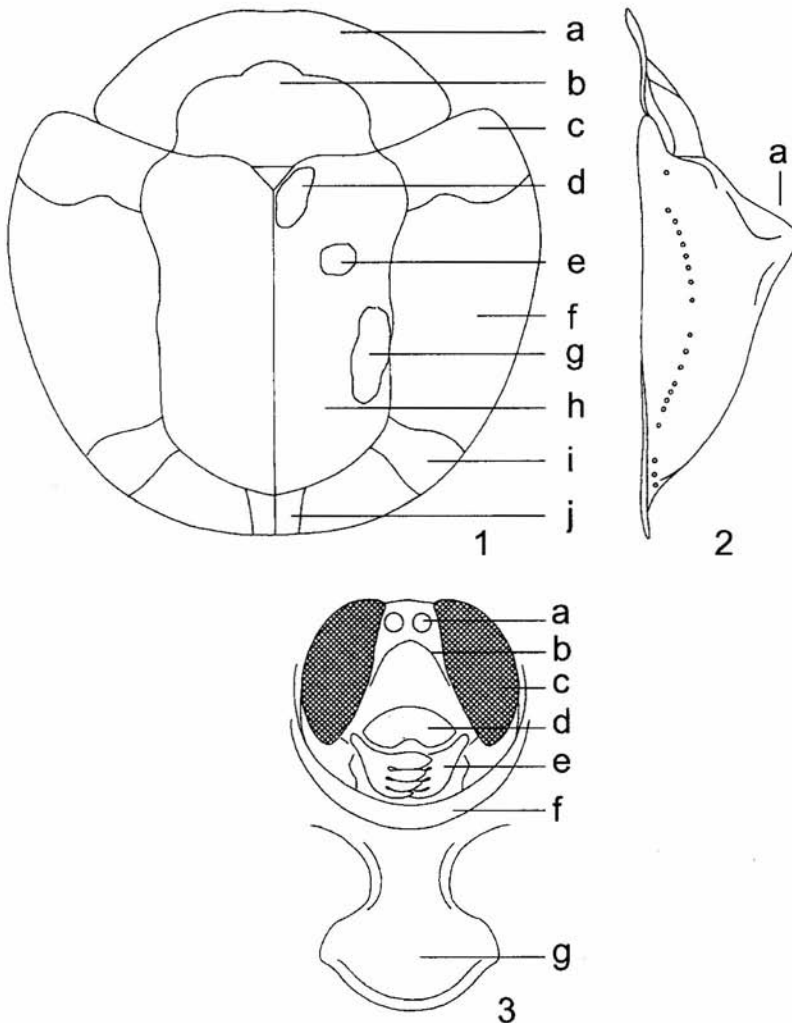
The classification presented here is based on standard morphological methods without cladistic analysis. Cladistic methods are not suitable for highly specialized phytophagous beetles, whose evolution was under the pressure of coevolutionary chemical interactions with host plants. Morphological evolution of these beetles is characterized by reductions and reversions and has a highly mosaic character, which makes it very difficult to find synapomorphies. The number of homoplastic characters in the specialized *Cassidinae* distinctly exceeds the number of synapomorphies. In the tribe *Aspidimorphini* all taxa of the genus level were created with no more than 8 characters. Phylogenetic polarisation of each character is impossible. For example reductions of external or internal pecten of claws, or/and reduction of elytral sculpture, or appearance of postscutellar tubercle, proceeded independently within many species groups. Also, investigation of DNA in the *Cassidinae* are not conclusive. OBERMAIER (2000) observed that the DNAs of various genera feeding on the same food plant are much more similar than the DNAs of various species from the same genus but feeding on different food plants.

In consideration of all these problems I based my classification mostly on the method of estimation *a posteriori*, supported by the Darwin rule (MAYR 1974). Because the number of available characters was limited, each unique character raised the rank of a taxon. This practical method is very useful in groups with the predominance of mosaic evolution as in the *Cassidinae*, and brought progress in classification of some phytophagous beetles, e.g. *Bruchidae* (BOROWIEC 1987).

CHARACTERISTIC OF THE TRIBE *ASPIDIMORPHINI*

MORPHOLOGY

The tribe *Aspidimorphini* contains usually small to moderately large, rarely large, species of cassids with tarsal claws pectinate at least on the inner margin. The often distinct pectens occur often also on outer margin of claws, but claws are



1-3. General morphology in the tribe *Aspidimorphini*: 1 - body dorsal (a - explanate margin of pronotum, b - disc of pronotum, c - humeral spot, d - postscutellar impression, e - principal impression, f - explanate margin of elytra, g - lateral impression, h - disc of elytra, i - posterolateral spot, h - sutural spot), 2 - body lateral (a - postscutellar tubercle), 3 - head and prosternum (a - antennal insertion, b - clypeal lines or grooves, c - eye, d - labrum, e - mandible, f - prosternal collar, g - prosternal process)

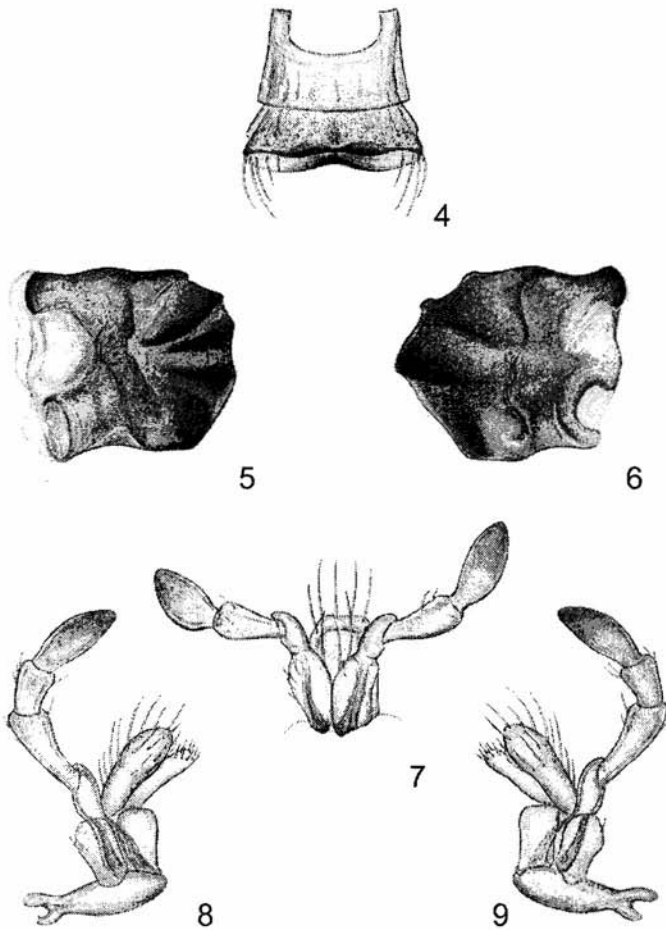
never toothed, and last segments of tarsi are never modified. In some taxa the inner pecten is very short, only slightly reaching beyond margin of claw, but always visible with 20x magnification of stereomicroscope (in many taxa of the tribe *Cassidini* claws are micropectinate, but the micropectens are well visible only after preparing the claw on a microscopic slide).

Body colouration in dried specimens is never metallic, but in life many species, especially from the genus *Aspidimorpha*, have a structural metallic tint. The ground colour in many species of *Aspidimorpha* is yellow to yellowish brown, marginalia in live specimens are usually strongly transparent, like glass (Tab. 1: 2). In the genus *Laccoptera*, the ground colour is usually darker than in the members of *Aspidimorpha*, reddish brown to brown, occasionally black (in the Oriental members, while in the African species black ground colour is common), dark coloured species have marginalia only slightly transparent in life, and usually opaque in dried specimens. The elytral disc of most species bear more or less developed pattern of darker spots, bands, and often elytral punctures are marked by darker areola. The marginalia of elytra are either monochromatic or, commonly, with humeral or both humeral and posterolateral spots.

Pronotum in the tribe *Aspidimorphini* is large and completely covers head (fig. 1). It is usually elliptical or semicircular, with rounded, only occasionally angulate sides. The pronotal disc is slightly to moderately convex, usually indistinctly bordered from the explanate margin, without special sculpture, or in some genera with distinct sculpture such as folds, wrinkles, striation and puncturation. The explanate margin is very broad, moderately declivous to almost horizontal. The surface of explanate margin is smooth and glabrous or with punctures, folds and wrinkles, but the sculpture is usually less developed than on the pronotal disc.

Scutellum triangular. Base of the elytra usually distinctly wider (fig. 1), rarely only slightly wider than the base of pronotum, occasionally the base of elytra as wide as the base of pronotum. Anterior margin of elytral disc with small teeth. Elytra mostly rounded, often triangular or slightly trapezoidal, rarely oval, very rarely elongate, almost parallel-sided. Elytral disc more or less convex, rarely depressed, often elevated or tuberculate in postscutellar area, the tubercle often large and conical (fig. 2). Impressions on each elytron: usually postscutellar, often principal, rarely lateral. Sculpture of elytra variable. In a group of aspidimorphoidal genera and subgenera disc usually only with more or less regular rows of punctures, but sometimes puncturation irregular, or occasionally elytra impunctate. In this group of genera, puncturation of disc is only occasionally coarse, with surface of disc appearing rugose. In a group of laccopteroidal genera, elytral sculpture is usually well developed, composed of coarse and dense punctures, wrinkles and costae, and surface of disc appears irregular to rugose. Explanate margin of elytra usually very broad, moderately to slightly declivous, sometimes almost horizontal, sculpture is usually correlated with sculpture on elytral disc, but in aspidimorphoidal genera surface of marginalia usually impunctate. Marginal row separating disc from explanate margin usually well developed. Extreme margin of elytra usually simple, occasionally double.

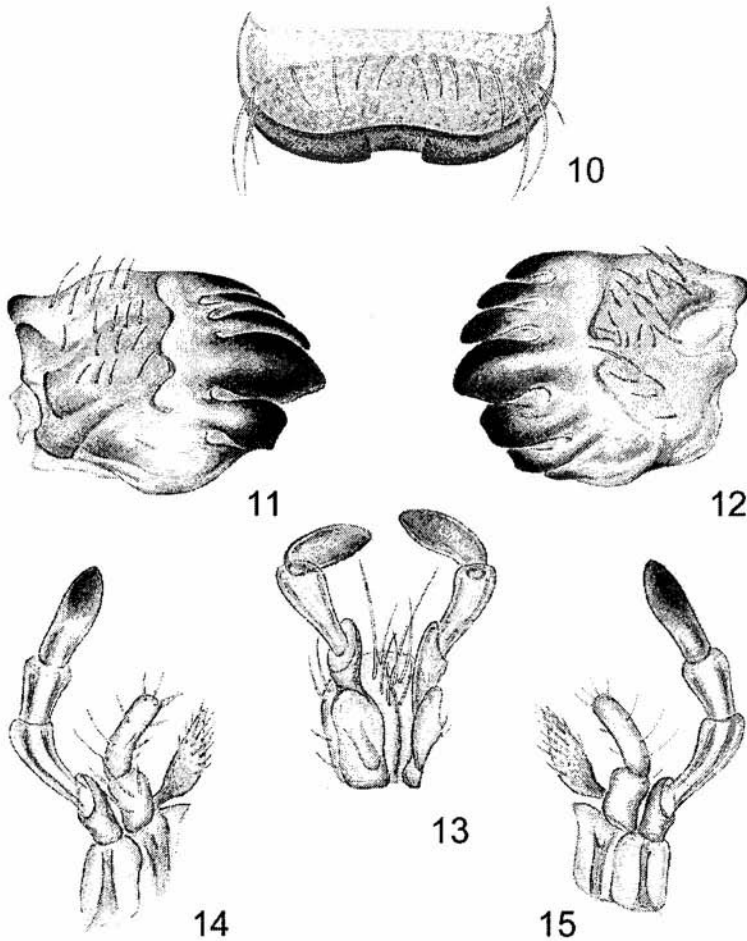
Head hidden by pronotum, clypeus completely horizontal. Eyes large, occupy almost whole sides of head (fig. 3). In aspidimorphoidal genera, surface of clypeus flat, usually without distinct impressions, sometimes with slightly elevated anterior margin. In laccopteroidal genera, clypeus convex, distinctly elevated before antennal insertions, apex often angulate. Clypeal lines usually fine, distinct at least in the basal half of clypeus. Surface of clypeus usually without sculpture, sometimes with a few fine punctures. Labrum broad, without median carina, anterior margin more or less emarginate in the middle (figs 4, 10, 16). The tribe *Aspidimorphini* has two types of mandibles: most species have mandibles with margin armed by few teeth (figs 11, 12, 17, 18) typical for the subfamily, but



4-9. *Aspidimorpha sanctaerucis*, mouthparts: 4 - labrum, 5, 6 - mandibles, 7 - labium and labial palpi, 8, 9 - maxillae and maxillary palp

in some specialized species of the genus *Aspidimorpha* the mandibles have only the cutting edge, without sharp teeth (figs 5, 6). Maxillae and labium typical for *Cassidinae*, without special modifications, but with distinct differences between genera (figs 7-9, 13-15, 19-21). Antennae slim and long, filiform, third segment usually distinctly longer than the second.

Ventrites of pronotum always without antennal grooves. Prosternum in aspidimorphoidal genera with very short, sometimes barely visible collar, in laccopteroidal genera the collar more distinct but never covers mouth parts. Sides of the collar never emarginate. Prosternal process in middle usually broad, flat or with shallow impression, occasionally with deep elongate impression, apical part

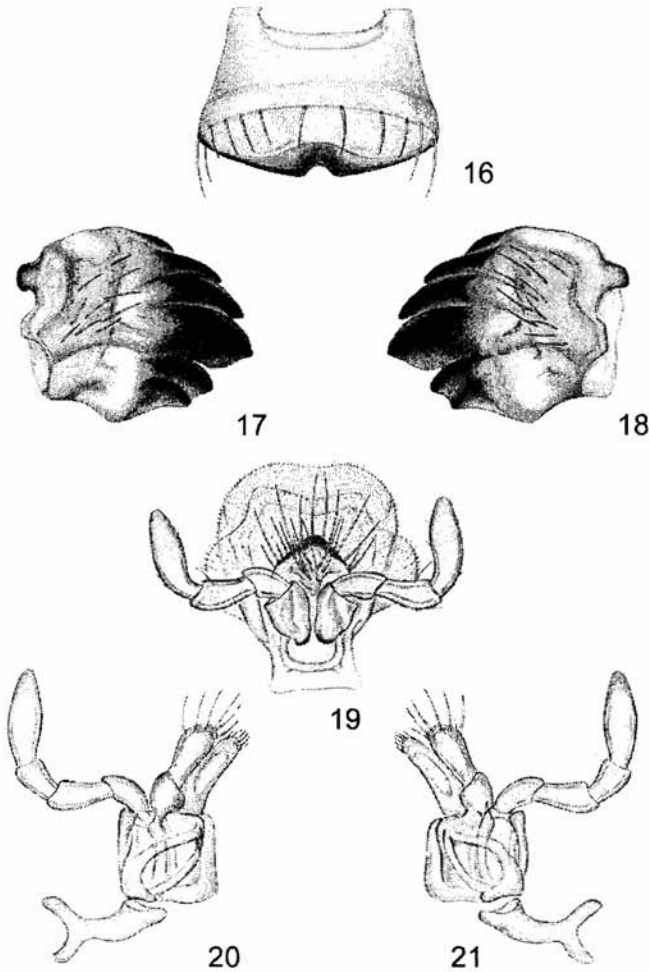


10-15. *Aspidimorpha miliaris*, mouthparts: 10 - labrum, 11, 12 - mandibles, 13 - labium and labial palpi, 14, 15 - maxillae and maxillary palpi

of prosternal process explanate, rhomboidal. Meso- and metathorax, and abdomen typical for *Cassidinae*, without modifications.

Legs slim, femora without modifications, tibiae straight, their anterior margin without distinct grooves or with shallow grooves. Tarsi broad, ventral side always with pubescent sole.

Sexual dimorphism usually indistinct. Males usually slightly smaller and stouter than females. In laccopteroidal genera, male antennae distinctly longer than in females, especially their last segment more elongated. Only occasionally males distinguished by the shape of pronotum and a broad body and sexual



16-21. *Aspidimorpha nepalensis*, mouthparts: 16 - labrum, 17, 18 - mandibles, 19 - labium and labial palpi, 20, 21 - maxillae and maxillary palpi

dimorphism distinct. In some species males tend to be hypertrophic with especially broad marginalia.

DISTRIBUTION

The tribe *Aspidimorphini* is distributed exclusively in the Old World tropics and subtropics, with only two species reaching the eastern Palaearctic.

BIONOMICS AND LARVAL STRUCTURE

Bionomics and preimaginal stages of most species are unknown. Preimaginal stages of the following Oriental species were hitherto described:

Aspidimorpha chandrika: last instar larva (MAULIK 1919).

Aspidimorpha deusta: first and last instar larva (MEDVEDEV and ZAITSEV 1993: under name *Sindia schawalleri*).

Aspidimorpha dorsata: first and last instar larva (MAULIK 1919, ZAITSEV and MEDVEDEV 1983).

Aspidimorpha furcata: all stages (GRESSITT 1952, TAKIZAWA 1980).

Aspidimorpha fuscopunctata: first and last instar larva (TAKIZAWA 1980: as *A. dorsata*, ZAITSEV and MEDVEDEV 1983).

Aspidimorpha innuncta: last instar larva and pupa (TAKIZAWA 1980).

Aspidimorpha miliaris: all stages (MAULIK 1919, GRESSITT 1952, TAKIZAWA 1980, ZAITSEV and MEDVEDEV 1983).

Aspidimorpha sanctaerucis: all stages (MAULIK 1919, GRESSITT 1952, ZAITSEV and MEDVEDEV 1983).

Aspidimorpha stevensi: first and last instar larva (ZAITSEV and MEDVEDEV 1983: as *A. vietnamica*).

Lacoptera (Lacopteroidea) nepalensis: last instar larva and pupa (KERSHAW and MUIR 1907, MAULIK 1919, HOFFMANN 1933, GRESSITT and KIMOTO 1963, TAKIZAWA 1980, ZAITSEV and MEDVEDEV 1983).

Lacoptera (Lacopteroidea) quatuordecimnotata: last instar larva and pupa (TAKIZAWA 1980).

Lacoptera (Sindia) sulcata: ootheca, larva and pupa (MAULIK 1948).

Lacoptera (Sindiola) hospita: last instar larva (ZAITSEV and MEDVEDEV 1983).

Lacoptera (Sindiola) vigintisexnotata: last instar larva (ZAITSEV and MEDVEDEV 1983).

The ootheca of *Aspidimorphini* is ornamented (Tab. 1: 1). The larvae are strongly modified, typical of specialized *Cassidinae*, with distinct lateral processes, long furci, often supplemented by fecal mask for camouflage. Larvae are egzophagous, usually solitary, but cycloalexia was also observed in some species (Tab. 2: 2). Pupae typical for specialized *Cassidinae* (Tab. 2: 1).

In detail, bionomics is known only for three species of Oriental taxa feeding on *Ipomea batatas*: *Aspidimorpha miliaris* (CORBETT and DOVER 1927), *Aspidimorpha furcata* (GRESSITT 1952) and *Lacoptera nepalensis* (HOFFMANN

1933). They were considered as not very effective pests of cultivated batatas. Their development from eggs to imago takes 21 to 26 days, but this could be lengthened to 64 days in bad food conditions.

Trophically the *Aspidimorphini* are connected with two related plant families, *Convolvulaceae* and *Solanaceae*. Most species feed on the *Convolvulaceae*, only some African species of the genus *Conchyloctenia* on *Solanaceae*. Apart from above mentioned species of anthropogenic habitats, most species were observed along the forest borders and in open habitats, where vines of the family *Convolvulaceae* have the best conditions to grow.

SYSTEMATICS

Based on the general structure of genitalia the Oriental taxa of the tribe *Aspidimorphini*, as well as those from other regions, form two complexes of genera:

- aspidimorphoidal complex, includes genera *Aspidimorpha*, *Conchyloctenia* and *Nilgiraspis*;
- laccopteroidal complex, includes only the genus *Laccoptera*.

The aedeagi of species belonging to the aspidimorphoidal complex are typical for specialized *Cassidinae*, that is weakly sclerotized, slim, with apex rounded or angulate, and often with a fine apical process. The aedeagi of laccopteroidal complex are stout, strongly sclerotized, with truncate apex, and without an apical process. In the aspidimorphoidal taxa, the sculpture of elytra is usually weakly developed and forms rows of fine punctures, only rarely the surface of elytra bears impressions and appears slightly irregular, but often the elytral disc possesses a conical postscutellar tubercle. In the laccopteroidal complex, the sculpture of elytra is usually strongly developed, the surface of elytra appears irregular, wrinkled and/or costate, but only rarely the disc of elytra has a postscutellar tubercle. In aspidimorphoidal complex the claws are pectinate usually on both the inner and outer margins, in *Laccoptera* the outer pecten is usually short to obsolete. Sexual dimorphism is distinct in antennal structure in the *Laccoptera* group. Morphological affinities, geographical distribution and feeding preferences suggest, that both groups are closely related and the tribe *Aspidimorphini* is monophyletic, but outgroup comparisons suggest that the laccopteroidal group has more apomorphic characters and has more specialized.

Because of mosaic the mixture of homoplastic and plesiomorphic characters, it is very difficult to groups *Aspidimorphini* species into generic level taxa. 25 names of genus level were hitherto proposed in the tribe *Aspidimorphini*, but only 6 of them could be accepted as unquestionable genera. In this paper, the concept of broad genera has been accepted, and most genus level names have been treated as subgenera or synonyms.

Four genera were recognized in the Oriental Region :

- *Aspidimorpha*: body broad, explanate margin of elytra broadly explanate, elytral disc often with postscutellar tubercle. Clypeus flat. Prosternal collar very short. Sculpture of elytra usually fine, with rows of fine punctures, only in exceptional cases elytra with coarse puncturation or with elongate costae. Claws usually with pecten on both margins, rarely outer pecten obsolete. Six basal segments of antennae glabrous. Aedeagus slim, weakly sclerotized, its apex rounded or angulate, often with apical process. Feed only on *Convolvulaceae*. None of these characters are synapomorphic, and some of them occur also in other taxa of *Aspidimorphini*, but never together and in different combinations.

- *Conchyloctenia*: body usually elongate, oval or short-oval, from depressed to almost spherical, explanate margin of elytra moderately broad, disc of elytra always without postscutellar tubercle. Clypeus elevated, especially before the base of antennae. Prosternal collar short. Sculpture of elytra fine or moderately developed, with rows of punctures or with completely irregular puncturation. Claws always with pectens on both margins. Six basal segments of antennae are glabrous. Aedeagus slim, weakly sclerotized, its apex rounded or angulate, often with apical process. Feeding on *Convolvulaceae* and *Solanaceae*.

- *Nilgiraspis*: body broad, explanate margin of elytra broadly explanate, elytral disc with postscutellar tubercle. Clypeus flat. Prosternal collar moderately long. Sculpture of elytra usually fine, with rows of fine punctures, but also with not numerous wrinkles. Claws with pectens on both margins. Only four basal antennal segments glabrous. Aedeagus slim, weakly sclerotized, apex with obtuse apical process. Host plant unknown.

- *Laccoptera*: body usually broad, but explanate margin of elytra often narrow and steeply declivous, elytral disc usually without postscutellar tubercle, or low and obtuse, but often with H-shaped elevation. Clypeus strongly elevated. Prosternal collar long. Sculpture of elytra usually strongly developed, with coarse punctures, wrinkles, costae and folds. Claws with distinct inner pecten and more or less reduced outer pecten. Six basal antennae segments glabrous. Aedeagus stout, strongly sclerotized, apex usually broadly truncate. Feed only on *Canvolvulaceae*.

The most distinctive is the genus *Laccoptera*, with the elevated clypeus, distinct prosternal collar, and strongly developed sculpture of elytra. Also the structure of male genital is pronouncedly specialized, because almost all genera of *Cassidini* have aedeagus of aspidimorphoidal type. The shortened outer pecten of claws in *Laccoptera* is probably a primitive character, but the elongate outer pecten in the subgenus *Sindiola* is apomorphic.

The genus *Nilgiraspis* comprises only one species. At first glance the genus *Nilgiraspis* is very similar to the genus *Aspidimorpha*, but differs in seven hairy apical segments of antennae (only six are present in most other genera of *Aspidimorphini* and in most genera of *Cassidini*). Similar antennae are known

only in the monotypical genus *Mahatsinia* SPAETH, 1919 from Madagascar, a member of *Aspidimorphini*, but in other characters including the strong elytral and pronotal sculpture, short outer pectens of claws, and stout aedeagus the Malagasy genus is much similar to the genus *Laccoptera*. In the specialized cassids from of tribe *Cassidini* sensu lato it is the rule that six basal antennal segments are bare and shiny, and only five apical segments are hairy and dull. This character is correlated with the presence of sensoral pits on pubescent antennal segments. Deviations from this rule occur only in a few genera and up to eight apical segments could be hairy and dull in extreme cases (the genera *Hovacassis* SPAETH, 1952 from Madagascar and *Ischnocodia* SPAETH, 1942 from Neotropics, members of *Cassidini*). Thus, this character was treated as very important diagnostic feature on the generic level.

The genus *Conchyloctenia* is the most similar to the genus *Aspidimorpha* and usually was treated as its subgenus. But BOROWIEC (1994) raised it to a genus based on a complex of characters including elevated clypeus, shape of body with elytra only slightly wider than pronotum and never tuberculate, narrow explanate margin, and a wide host spectrum, with some species feeding on *Solanaceae*. In the Oriental Region the genus comprises only one species, but it save 16 species widely distributed in the Ethiopian Region except Madagascar, and a few of them are the most common African cassids. Species of *Conchyloctenia* with elongate, almost paralelsided body (like in the only Oriental member of the genus) are at first glance very similar to the *Aspidimorpha cincta* group from Africa (*A. orientalis* from Orient probably also belongs to the group), but none of the representatives of *Aspidimorpha* have elevated clypeus, as in *Conchyloctenia*.

The genus *Aspidimorpha* is the most numerous, and shows the most diverse morphology. It was subdivided into 10 subgenera. The nominotypical occurs in whole range of the genus, the other subgenera are known mostly from Africa (BOROWIEC 1997), except one from Australia and one Oriental. A large diversity of species of the nominotypical subgenus makes diagnosy of this subgenus difficult, but permite its subdivision it into several species groups, which were successfully employed in the classification of Afrotropical species (BOROWIEC 1997).

The genera *Conchyloctenia* and *Nilgiraspis* comprise each only a single species in the Oriental Region. The genera *Laccoptera* and *Aspidimorpha* are more numerous. In the genus *Laccoptera* 10 subgenera have been proposed (HINCKS 1952, BOROWIEC 1994), four of them from the Oriental Region: *Sindia* WEISE 1897, *Sindiola* SPAETH 1902, *Indocassis* SPAETH 1952 and *Laccopteroidea* SPAETH 1952. BOROWIEC (1992) synonymized *Indocassis* with the subgenus *Orphnodella* SPAETH 1902 (which till now was known only from Africa), because the type species of both subgenera differ only in subtle species characters. The analysis of Oriental species showed that it is possible to group them into five subgenera, four mentioned above and one new subgenus, *Sindiolina*, for *Laccoptera sedecimmaculata*, which was classified in the subgenus *Sindia*. But *L. sedecimmaculata* has so many characters different from *L. sulcata* (OL.), which is the type

species of *Sindia*, and from the remaining species of the genus *Laccoptera* that it should be placed in distinct subgenus. Phylogenetic relationships between the subgenera of *Laccoptera* are not clear. The endemic Oriental subgenera *Laccopteroidea*, *Sindia*, *Sindiola*, and *Sindiolina* belong probably to specialized, especially *Sindiola* has the most apomorphic appearance with the distinct outer pecten of claws and a modified aedeagus, while African subgenera belong to generalized.

The Oriental subgenera of *Laccoptera* are characterised by the following characters:

- *Sindiolina* subgenus nova: body oval, almost parallel-sided. Base of elytra slightly wider than base of pronotum. Pronotum semicircular with maximum width at base. Pronotal disc glabrous and shiny, without sculpture. Elytral disc with punctures, without sculpture composed with wrinkles or costae. Claws with distinct inner pecten and with almost reduced outer pecten. *Sindiolina* seems to be the most primitive because of its fine sculpture of body. Also primitive are semicircular pronotum with distinct posterior angles, and slim body with narrow explanate margin.

- *Sindia* WEISE, 1897: large cassids, body length above 10 mm. Elytra elongate, almost parallel-sided, elytral sides double marginate. Pronotal sculpture less developed, only with impressions but without distinct wrinkles or folds. Elytral sculpture strongly developed with numerous wrinkles and costae. Claws with distinct inner pecten and almost obsolete outer pecten. Elongate body, fine pronotal sculpture, narrow marginalia are primitive characters in this subgenus, while double marginate elytral margins and modified aedeagus are apomorphic.

- *Orphnodella* SPAETH, 1902: body elongate, base of pronotum slightly wider than base of elytra. Pronotal and elytral sculpture strongly developed, margins of elytra simple marginate. Claws with distinct inner pecten, outer pecten fine or completely obsolete. In its body shape it is similar to the subgenus *Sindia*, but the subgenus *Orphnodella* has strongly specialized pronotal sculpture. Two Oriental species are known only from India and adjacent regions, 19 remaining species are distributed in Africa. In the Afrotropical region there are species of this subgenus with a subtriangular body. The most diverse subgenera *Orphnodella* and *Laccopteroidea*, both Afrotropical and Oriental lines manifest the same trend, from a generalized, slim to triangular body. Two members of *Orphnodella* from India represent probably an old element from the time when Indian subcontinent was connected to the African continental plate.

- *Laccopteroidea* SPAETH, 1952: body from broadly oval to triangular, base of elytra always wider than base of pronotum. Elytra usually with distinct pattern, margins of elytra simple marginate. Surface of pronotum rarely glabrous, often with punctures, wrinkles or stripes. Surface of elytra with coarse punctures, often with wrinkles and folds, but less irregular than in both previous subgenera. Claws with distinct inner pecten, outer pecten barely marked. The subgenus *Laccoptero-*

idea is the most similar to mostly African subgenus *Orphnodella*. The Oriental subgenus differs only in a less developed dorsal sculpture and distinct elytral pattern. Both are sister groups.

- *Sindiola* SPAETH, 1902: body usually triangular or trapezoidal, rarely oval. Pronotum without distinct sculpture. Base of elytra distinctly wider than base of pronotum. Claws with distinct pectens on both margins. A very distinct subgenus, only pronotum without sculpture is its primitive character, while the distinctly developed outer pecten of claws and modified genitalia are strongly specialized. In many papers *Sindiola* was treated as a separate genus, but except for the developed outer pecten of claws all its remainder characters are typically laccopteroidal and thus it should be treated as the most specialized subgenus of *Lacoptera*.

Only the genus *Lacopteroidea* is quite speciose and, despite its homogeneity, possible to subdivide into species group:

- *L. yunnanica* group: the most separate, comprises only one species. It differs in short-oval body, strongly developed sculpture of body, and almost reduced elytral and pronotal pattern. At first glance *L. yunnanica* is more similar to the African species from *L. corrugata* group of the subgenus *Orphnodella* than to Oriental representative of the subgenus *Lacopteroidea*.

- *L. nepalensis* group: comprises species with distinctly triangular body, distinctly developed pronotal sculpture, well marked spots on marginalia, and usually with sutural spot on explanate margin of elytra (except *L. cheni*). Mainly continental species – *L. nepalensis*, *L. cheni*, *L. fruhstorferi*, and *L. prominens*, and only one species from the Philippines: *L. schultzei*.

- *L. quatuordecimnotata* group: comprises only one species from the southern and middle part of India which is characterized by large body, moderately developed pronotal sculpture and strongly modified apex of aedeagus.

- *L. tredecimpunctata* group: the smallest species of the subgenus, inhabiting islands of the western part of Pacific, with triangular body, often without sutural spot on explanate margin of elytra, usually with distinct pronotal sculpture. The group comprises: *L. tredecimpunctata*, *L. tredecimguttata*, *L. discreta*, *L. fasciata*, *L. sculpturata*, *L. sedecimnotata*.

- *L. fallax* group: moderately large species, inhabiting mostly islands of the eastern parts of Pacific, with short-oval body or slightly trapezoidal, often with slightly developed pronotal sculpture, and with distinct sutural spot on explanate margin of elytra. The group comprises: *L. fallax*, *L. impressa*, *L. permodica*, *L. sutteri*.

The genus *Aspidimorpha* in Oriental Region is very homogeneous and can be subdivided it only two subgenera: the nominotypical which comprises almost all species, and the monotypical subgenus *Dianaspis*.

The subgenus *Dianaspis* distinctly differs from remaining species of the genera *Aspidimorpha* in its strongly developed sexual dimorphism. The females look like typical representatives of the genus *Aspidimorpha* from groups without postscutellar tubercle, while the males have a unique structure of pronotum, which is semicircular, wider than the base of elytra, on both sides of the base strongly emarginate and with the strongly protruding posterad posterior corners. *Dianaspis* differs also from the Oriental representatives of nominotypical subgenus in reduced outer pecten of claws (however subgenera with reduced outer pecten of claws are known from the Afrotropical Region).

In the nominotypical subgenus it is possible to separate 10 group of species, in which external characters are correlated with the aedeagus structure:

- *A. sanctaecrucis* group: large and moderately large species, with large, conical postscutellar tubercle (except *A. sarawacensis*), elytral disc without distinct pattern (except *A. malaccana*). The most important characters of the group is the structure of mandibles, which are without teeth, only with cutting edges. Aedeagus in this group is long and slim, moderately curved ventrad. The group comprises *A. bataviana*, *A. birmanica*, *A. castaneipennis*, *A. elevata*, *A. inuncta*, *A. limbipennis*, *A. lobata*, *A. malaccana*, *A. ponderosa*, *A. sanctaecrucis*, *A. sarasinorum*, *A. sarawacensis*, *A. stevensi*, and *A. tamdaoensis*. In this group it is possible to distinguish a subgroup of species with shortened inner pectens on claws and regular elytral sculpture. The subgroup comprises *A. castaneipennis* and *A. ponderosa*. Also *A. sarawacensis* has a distinct position because of lacking a postscutellar tubercle.

- *A. quadrilobata* group: characterized by the base of elytra strongly bent anterad and pronotum emarginate on sides with distinct lateral angles. As in the members of previous group, mandibles are lacking teeth, and have only cutting edges. The group comprises only *A. quadrilobata* from the Philippines.

- *A. miliaris* group: comprises representatives of almost rounded shape, without postscutellar tubercle, and with spotted pattern of elytra. Mandibles with teeth. The group also differs in the structure of larvae, with first instar without the lateral processes of anal furci. The group comprises *A. miliaris* and *A. hexaspilota*.

- *A. deusta* group: comprises species with elongate, almost parallel-sided body, acuminate humeri, pronotum with spots, and depressed elytral disc without postscutellar tubercle. In the Oriental Region to the group is represented only by *A. deusta*, a second species, *A. angoramensis*, is known only from New Guinea.

- *A. orientalis* group: includes species with oval body, semicircular pronotum, elytra without postscutellar tubercle, base of elytra only slightly wider than the base of pronotum and rounded humeral angles. In the Oriental Region the group is represented only by *A. orientalis*, the most close is *A. cincta* group with 9 species in the Afrotropical Region.

- *A. adherens* group: comprises only one species, with slightly elongate body, elliptic pronotum, base of elytra wider than base of pronotum, elytral disc with low postscutellar tubercle, black scutellum, and polymorphic pattern on

elytra. *A. adherens* comes mainly from New Guinean and occurs only in extreme eastern parts of the Oriental Region.

- *A. fusconotata* group: includes species with rounded body, elliptic pronotum, base of elytra moderately wider than base of pronotum, and elytra without postscutellar tubercle. Two species from the Philippines: *A. fusconotata* and *A. orbicularis*.

- *A. dorsata* group: includes moderately large representatives, with trapezoidal or rounded body, elliptic pronotum, elytra always with postscutellar tubercle, base of elytra wider than base of pronotum. Aedeagus in this group is long and slim, with apex in the shape of a pointed arch. The group comprises *A. bilobata*, *A. biradiata*, *A. dorsata*, *A. dulcicula*, *A. fuscopunctata*, *A. inquinata*, *A. intermedia*, *A. limbata*, *A. luzonica*, *A. musta*, *A. pacalis*, *A. suavis*, *A. subcruciata*, and *A. sulawesica*.

- *A. indica* group: includes small representatives with rounded body, elliptic pronotum, elytra with postscutellar tubercle (except *A. transparipennis*), and base of elytra distinctly wider than base of pronotum. Aedeagus in this group is slim, moderately bent ventrad (except *A. difformis*), with apex in the shape of a pointed arch. The group comprises: *A. biremis*, *A. difformis*, *A. indica*, *A. mutilata*, *A. snizeki*, *A. timorensis*, *A. toxopei*, and *A. transparipennis*.

- *A. furcata* group: includes small representatives with rounded body, elliptic pronotum, elytra always with postscutellar tubercle, and base of elytra distinctly wider than base of pronotum. Aedeagus in this group is distinctly widened apically, spoon-like, strongly bent ventrad. The group comprises *A. amabilis*, *A. assimilis*, and *A. furcata*.

The position of *A. moluccana* is uncertain because of lack of the male specimens to study. Based on its small size, general body shape, and the structure of mandibles and claws, it belongs to the *A. indica* or *A. furcata* group.

SYSTEMATIC REVIEW

ABBREVIATIONS:

Biometrical data:

- L** – body length;
W – body width;
L/W – length/width ratio;
Lp – length of pronotum;
Wp – width of pronotum;
Wp/Lp – width/length of pronotum ratio.

Collections:

- ASB** – Academia Sinica, Beijing, China;
BMNH – British Museum Natural History, Londyn, England;
CAS – California Academy of Sciences, San Francisco, USA;
FK – coll. F. KANTNER, Lipi n. České Budejovice, Czech Republic;
HU – Zoological Museum, Helsinki University; Helsinki, Finland;
ITZ – Instituut voor Taxonomische Zoologie, Amsterdam, The Netherlands;
IZPAN – Museum and Institute of Zoology, Polish Academy of Sciences, Warsaw, Poland;
JB – coll. J. BEZDĚK, Brno, Czech Republic;
LB – coll. L. BOROWIEC, Department of Systematic Zoology and Zoogeography, University of Wrocław, Wrocław, Poland;
MCSNG – Museo Civico di Storia Naturale, Genova, Italy;
MCZ – Museum of Comparative Zoology, Cambridge, USA;
MM – Manchester Museum, Manchester, England.
MNHN – Muséum National d'Histoire Naturelle, Paris, France.
MS – coll. M. SNIŽEK, České Budejovice, Czech Republic;
MTD – Museum für Tierkunde, Dresden, Germany;
NMB – Naturhistorisches Museum Basel, Basel, Switzerland;
NRS – Naturhistoriska Riksmuseet Stockholm, Sweden;
PU – coll. Department of Zoology, Modern College, Pune, India;
SM – Senckenberg Museum, Frankfurt a. Main, Germany;
SMNS – Staatliches Museum für Naturkunde, Stuttgart, Germany;
ZMHU – Zoologisches Museum, Humboldt Universität, Berlin, Germany;
ZMK – Zoologisk Museum, Copenhagen, Denmark.

Tribe: *Aspidimorphini* CHAPUIS, 1875

Aspidimorphites CHAPUIS, 1875: 406.

Aspidormophitae [sic]: SPAETH, 1914 d: 129.

Aspidomorphini: HINCKS, 1952: 336; GRESSITT, 1952: 460; GRESSITT et KIMOTO, 1963: 948; SEENO et WILCOX, 1982: 175; CHEN et al., 1986: 566.

Aspidimorphini: BOROWIEC, 1994 a: 42, 1997 b: 5.

Highly specialized cassids. Body usually very broad, with explanate marginalia. Clypeus horizontal. Prosternal collar very short, mouth part free. Antennae slim, filiform. Tarsal claws at least on inner margin pectinate. Tropical and subtropical regions of the Old World.

KEY TO THE GENERA

1. Six basal antennal segments smooth and glabrous.
..... 2.
- Only four basal antennal segments smooth and glabrous.
..... *Nilgiraspis*
2. Clypeus at least before antennal insertions convex or margined by a fold.
..... 3.
- Clypeus flat or slightly elevated in middle, never margined by a fold.
..... *Aspidomorpha*
3. Clypeus in basal part flat, before antennal insertions margined by a fold. Body elongate, parallel-sided, depressed. Elytral sculpture moderate, intervals wider than rows. Claws with distinct pecten on both sides.
..... *Conchyloctenia*
- Clypeus convex, with a tubercle before antennal insertions. Body usually subtriangular or subtrapezoidal, occasionally elongate and then elytral sculpture strong, intervals narrower than rows. Claws usually with distinct pecten only on inner margin (except the subgenus *Sindiola*).
..... *Laccoptera*

Genus: *Aspidomorpha* HOPE, 1840

Aspidomorpha HOPE, 1840: 158 (type species: *Cassida miliaris* FABRICIUS, 1775, by original designation); CHAPUIS, 1875: 407; SEENO et WILCOX, 1982: 175; BOROWIEC, 1992: 123, 1994 a: 12, 1997: 5.

Aspidomorpha [!]: AGASSIZ, 1846: 16, 1848: 104; SPAETH, 1914 e: 67; HINCKS, 1952: 336, 1962: 243; GRESSITT, 1952: 460; GRESSITT et KIMOTO, 1963: 948; CHEN et al., 1986: 578 (invalid emendation).

Iphinoë SPAETH, 1898b: 540 (type species: *Iphinoë ganglbaueri* SPAETH, 1898, by monotypy); not BATE, 1856.

Spaethia BERG, 1899: 79 (new name for *Iphinoë* SPAETH, 1898 not BATE, 1856); SPAETH, 1914 e: 78 (as subgenus of *Aspidomorpha*); HINCKS, 1952: 336 (as synonym of *Aspidomorpha*), subgenus (Afrotropical).

- Weiseocassis* SPAETH, 1932b: 3 (type species: *Aspidomorpha prasina* WEISE, 1899, by original designation); HINCKS, 1952: 337 (as subgenus); SEENO et WILCOX, 1982: 175, subgenus (Afrotropical).
- Megaspidomorpha* SPAETH, 1943: 48, nomen nudum (type species not designated).
- Megaspidomorpha* HINCKS, 1952: 336 (type species: *Cassida chlorotica* OLIVIER, 1808, by monotypy); SEENO et WILCOX, 1982: 175, subgenus (Afrotropical).
- Dianaspis* CHEN et ZIA, 1984: 80, 82 (type species: *Aspidomorpha denticollis* SPAETH, 1932 = *Dianaspis bifoveolata* CHEN et ZIA, 1984, by monotypy); CHEN et al., 1986: 588; BOROWIEC, 1992: 124 (as subgenus), subgenus (Oriental).
- Neoaspidomorpha* BOROWIEC, 1992: 126 (type species: *Aspidomorpha septemcostata* WAGENER, 1881, by monotypy), subgenus (Australian).
- Afroaspidomorpha* BOROWIEC, 1997: 7 (type species: *Cassida nigromaculata* HERBST, 1799, by original designation), subgenus (Afrotropical).
- Aspidocassis* BOROWIEC, 1997: 59 (type species: *Cassida confinis* KLUG, 1835, by original designation), subgenus (Afrotropical).
- Semiaspidomorpha* BOROWIEC, 1997: 96 (type species: *Aspidomorpha chlorina* BOHEMAN, 1854, by original designation), subgenus (Afrotropical).
- Spaethiomorpha* BOROWIEC, 1997: 162 (type species: *Aspidomorpha haefligeri* SPAETH, 1906, by monotypy), subgenus (Afrotropical).

Body broad, marginalia strongly explanate, elytral disc often with postscutellar tubercle. Clypeus flat. Prosternal collar very short. Elytral sculpture usually very fine, only occasionally elytral disc coarsely punctate or with elongate elevations. Claws usually with pecten on both sides, occasionally outer pecten reduced.

Large genus, hitherto known 187 species subdivided into 10 subgenera. Most of them in the Afrotropical Region.

KEY TO SUBGENERA

1. Sexual dimorphism indistinct. Pronotum with broadly rounded sides or semi-circular, hind angles right angled. Elytra often with postscutellar tubercle. Claws with pecten on both margins, but sometimes pecten very short, not reaching beyond the margin of claw.
..... *Aspidomorpha* s. str.
2. Sexual dimorphism distinct. Base of pronotum emarginate on sides, in males hind angles strongly protruding posterad. Elytra without postscutellar tubercle. Claws with inner pecten distinct but short, not longer than 1/5 the length of claw, outer pecten barely marked.
..... *Dianaspis*

Subgenus: *Aspidomorpha* s. str.

Sexual dimorphism indistinct. Body usually circular, rarely oval or parallel-sided. Pronotum usually ellipsoidal, rarely semicircular, its base never emarginate. Elytral disc often with postscutellar tubercle. Claws with pecten on both margins, but sometimes pecten very short, not reaching beyond margin of claw.

144 species hitherto described, mostly from the Afrotropical Region including Madagascar.

KEY TO SPECIES

1. Elytra with postscutellar tubercle, sometimes the tubercle is low and obtuse, but concave beyond the top of the tubercle (figs 49, 122, 174).
..... 9.
- Elytra without postscutellar tubercle, at most slightly elevated at the postscutellar area (figs 142, 223, 252, 439, 579).
..... 2.
2. Body circular, L/W = 0.93-1.13. Base of elytra distinctly wider than pronotum (figs 222, 251, 374, 505).
..... 5.
- Body oval, L/W = 1.23-1.42. Base of elytra usually only slightly wider than pronotum (figs 141, 438, 578).
..... 3.
3. Body length above 7.5 mm. Elytra with numerous black or brown spots, sometimes coalescent, occasionally disc mostly black (figs 147-152, 444-447). Outside the Palaearctic region.
..... 4.
- Body length below 7.3 mm. Elytra without numerous brown or black spots, often most of the disc brown to brownish-black (figs 584-587). Eastern Palaearctic.
..... *transparipennis*
4. Humeral angle rounded (fig. 438). Pronotum without spots (figs 444-447). Ventrites usually partly black. At most two distal antennal segments black. Northern India and Sikkim.
..... *orientalis*
- Humeral angle acute (fig. 141). Pronotum usually with two spots (figs 147-150). Ventrites uniformly yellow. At least four distal antennal segments black. Indonesia, Philippines, and the Australian Region.
..... *deusta*
5. Mandibles with teeth (figs 11, 12). Elytra usually with spots, occasionally uniformly yellow.
..... 6.
- Mandibles without teeth, only with cutting edge (figs 5, 6). Elytra always uniformly yellow. Borneo and Cameron Highlands on Malay Pen.
..... *sarawacensis*
6. Larger species, 9.1-15.7 mm long. Elytra usually with numerous black spots or uniformly yellow, occasionally with black bands or mostly black (figs 257-260, 381-393). Widespread or limited to Indochina.
..... 7.
- Smaller, 6.4-9.1 mm long. Elytra variable, with dark reticulation, with dark ring, or with dark spot in postscutellar area and bands along disc, occasionally elytra uniformly yellow (figs 228-239). Endemic to the Philippines.
..... 8.

7. Length 9.7-15.7 mm (usually above 10 mm). Elytra usually with numerous black spots, marginalia usually with spots, anterior margin of marginalia always partly or completely black (figs 381-393). Base of each elytron with two spots, first on humerus, second close to scutellum apex. At least two distal antennal segments infusate. Widespread in the whole Oriental and most part of the Australian Region.
 *miliaris*
- Length 9.1-10.6 mm (usually below 10 mm). Elytra uniformly yellow or with a few small, black spots, occasionally with black band along sides; marginalia usually without spots, occasionally with humeral spots, anterior margin of marginalia never black (figs 257-260). Base of each elytron with single spot placed in impression before the humeral callus. Only last antennal segment infusate. Cambodia, Thailand and Vietnam.
 *hexaspilota*
8. Pectens of claws longer, inner ones extending to 2/5, outer ones to 1/3 length of the claw (figs 225, 226).
 *fusconotata*
- Pectens of claws shorter, inner ones extending to 1/3, outer ones to 1/5 length of the claw (figs 434, 435).
 *orbicularis*
9. Scutellum yellow to yellowish brown. 10.
- Scutellum black. Eastern part of Indonesia and Papuan Subregion.
 *adhaerens*
10. Mandibles with only cutting edge, without teeth (figs 5, 6). Usually large species, with length above 10 mm. Elytral disc usually uniformly coloured, yellowish, yellowish-red or yellowish-brown, occasionally with dark spots. 11.
- Mandibles with distinct teeth (figs 11, 12). Usually smaller species, with length below 12 mm. Elytral disc often maculate. 28.
11. Anterior margin of elytron almost straight, humeral angles slightly to moderately protruding anterad. Pronotal sides rounded. 12.
- Anterior margin of elytron strongly curved anterad (up to 90°), humeral angles strongly protruding anterad (figs 479, 481). Pronotal sides shallowly emarginate, forming distinct angle. Philippines only.
 *quadrilobata*
12. Inner pecten of claws very short, extending at most to 1/4 length of claw (figs 124, 476, 502). 13.
- Inner pecten of claws longer, extending at least to 1/3 length of claw (figs 91, 118, 316, 335, 348, 492). 15.

13. Base of elytra distinctly wider than pronotum. Marginalia at least with humeral spots. Elytral disc in apical half without black spots (figs 121, 473, tab. 6: 1-3).
..... 14.
- Base of elytra only slightly wider than pronotum, body almost regularly circular. Marginalia without spots. Apical half of elytral disc with black spots (fig. 499, tab. 7: 5). Sulawesi only.
..... *sarasinorum*
14. Elytral impressions distinct, postscutellar impressions deep, bordered by distinct fold, surface of elytra appears irregular. Humeral spots often black, sometimes behind humeral callus occurs elongate black spot (fig. 473, tab. 6: 3). Posterolateral spots always present. Endemic to Moluccas (Ambon, Seram, Buru).
..... *ponderosa*
- Elytral impressions shallow, postscutellar impressions shallow, bordered by indistinct fold or without border, surface of elytra appears much regular. Humeral spots never black, disc always without dark spots (fig. 121, tab. 6: 1, 2). Posterolateral spots sometimes absent. Species outside Moluccas.
..... *castaneipennis*
15. Posterolateral spots of marginalia present (figs 115, 313, 345).
..... 16.
- Posterolateral spots of marginalia absent (figs 197, 326, 495).
..... 23.
16. Slimmer, less circular species, L/W = 1.15-1.28, occasionally below 1.15 (up to 1.09) and then inner pecten of claws extending at least to half length of claw.
..... 17.
- Stouter, more circular species, L/W = 0.97-1.14, occasionally to 1.15 and then inner pecten of claws extending at most to 1/3 length of claw.
..... 18.
17. Smaller, length 8.0-11.2 mm. Third antennal segment less than twice the length of the second (fig. 318). Surface of elytra indistinctly folded, does not appear irregular. Ventral side of aedeagus without striated membrane. South India.
..... *inuncta*
- Larger, length 10.1-12.6 mm. Third antennal segment above 2.2 times the length of the second (fig. 120). Surface of elytra distinctly folded, appears irregular. Ventral side of aedeagus with striated membrane. Burma and Nepal.
..... *birmanica*
18. Elytra without black spots.
..... 19.
- Elytra with pattern of black spots, at least punctures of sides of disc with black areola (figs 351-353). S Burma, Thailand and Malay Pen.
..... *malaccana*

19. Prosternal collar and anterior part of prosternal process bare or with sparse hair.
..... 20.
- Prosternal collar and anterior part of prosternal process with dense, long hair.
N Vietnam.
..... *tamdaoensis*
20. Inner pecten of claws long, extending at least to 2/5 length of claw (figs 91, 492, 521).
..... 21.
- Inner pecten of claws short, extending at most to 1/3 length of claw (fig. 335).
India, Ceylon, and Bangladesh.
..... *lobata*
21. Third antennal segment at least 2.3 times the length of the second (figs 93, 494). Sutural margin never black. Surface of elytra appears more or less irregular.
..... 22.
- Third antennal segment approximately twice the length of the second (fig. 23).
Sutural margin usually narrowly black. Surface of elytra appears regular.
Cambodja, Thailand and Vietnam.
..... *stevensi*
22. Larger, length 10.0-14.1 mm (usually above 12 mm). Mostly continental, rare on Borneo, very rare on Java and Sumatra.
..... *sanctaecrucis*
- Smaller, length 8.1-11.5 mm (usually below 10.5 mm). Insular, common on Java and Bali, rare on Borneo.
..... *bataviana*
23. Elytra without dark pattern.
..... 24.
- Elytra with dark pattern, at least punctures of the sides of disc with black areola (fig. 352). S Burma, Thailand, and Malay Peninsula.
..... *malaccana* (rare aberration without posterolateral spots)
24. Marginalia without humeral spots.
..... 25.
- Marginalia with humeral spots, extending at least to 1/3 width of marginalia.
Three species very difficult to identify.
..... 26.
25. Smaller, length 9.8-13.0 mm. Inner pecten of claws extending beyond half length of claw (fig. 200). Mostly Indonesia, Palawan of the Philippines, and Malay Peninsula.
..... *elevata*
- Larger, length 12.5-15.0 mm. Inner pecten of claws extending at most to 2/5 length of claw (fig. 329). Ceylon, and India (Assam).
..... *limbipennis*
26. Body length usually above 10 mm. Body stouter, especially in males.
..... 27.

- Body length usually below 10 mm. Body slimmer. Insular species, common on Java and Bali, rare on Borneo.
..... *bataviana* (rare form without posterolateral spots)
- 27. Inner pecten of claws usually extending half length of claw (fig. 492). Some specimens impossible to distinguish from the next species.
..... *sanctaecrucis* (form from Hainan)
- Inner pecten of claws usually extending to 2/3 length of claw (fig. 200).
..... *elevata* (common form from Indonesia with almost obsolete humeral spots)
- 28. Marginalia without spots.
..... 29.
- Marginalia with at least humeral spots.
..... 35.
- 29. Inner pecten of claws long, extending at least to 1/3 length of claw (figs 244, 271).
..... 30.
- Inner pecten of claws very short, extending at most to 1/5 length of claw (fig. 540). Endemic to Sulawesi.
..... *sulawesica*
- 30. Larger species, length above 8 mm.
..... 31.
- Smaller species, length below 8 mm.
..... 34.
- 31. Humeral angles obtuse to rounded (figs 241, 320).
..... 32.
- Humeral angles acute (fig. 549). Endemic to Timor.
..... *timorensis*
- 32. Elytral disc without black pattern, punctures provided at the most with reddish to brown areola. Inner pecten of claws longer, extending to 2/5-2/3 length of claw (figs 244, 265, 271). Usually less than 10 mm long.
..... 33.
- Elytral disc with black pattern (fig. 320). Inner pecten of claws shorter, extending to 1/3 length of claw (fig. 323). Length above 10 mm. Java, Sumatra, Salajar, and Malaysia.
..... *limbata*
- 33. Stout, L/W ratio usually below 1.10. Inner pecten of claws longer, extending to 2/3 length of claw (fig. 244). Length usually above 8.5 mm. Widespread in the whole Oriental Region.
..... *fuscopunctata*
- Slim, L/W ratio usually above 1.10. Inner pecten of claws shorter, extending to half length of claw (fig. 265). Length always below 8.5 mm. Widespread in the continental part of the Oriental Region, very rare on the islands (Sumatra, Java, Palawan).
..... *indica* (very rare, large specimens with reduced spots on marginalia)

34. Postscutellar tubercle low, obtuse (fig. 49). Puncturation of elytral disc behind humerus very fine. Stout, L/W ratio in both sexes below 1.18. Aedeagus spoon-like, its apex strongly curved ventrad (figs 80-82). Malay Peninsula, Sumatra, Java, and Borneo.
 *assimilis*
- Postscutellar tubercle higher, angulate (figs 414, 416). Puncturation of elytral disc behind humerus coarse. Slimmer, L/W ratio in both sexes usually above 1.18, occasionally in males less than 1.18, up to 1.13. Aedeagus slim, not spoon-shaped, its apex softly curved ventrad (figs 365-367). Malay Peninsula, Sumatra, Java, Bali, and Lombok
 *mutilata*
35. Elytra only with humeral spots. 36.
- Elytra with both humeral and posterolateral spots. 45.
36. Inner pecten of claws shorter, extending at most to 1/3 length of claw (figs 47, 193, 342). 37.
- Inner pecten of claws longer, extending at least to 2/5 length of claw (figs 131, 182, 244). 40.
37. Disc of elytra uniformly coloured, without pattern. 38.
- Disc of elytra with pattern, with a spot at least behind postscutellar tubercle. 39.
38. Antennae uniformly yellow. Humeral angles rounded, margin behind the angle not emarginate (fig. 94). Philippines: Luzon.
 *bilobata*
- Last antennal segment black. Humeral angles well marked, margin behind the angle shallowly emarginate (fig. 339). Philippines: Luzon, Palawan.
 *luzonica*
39. Large species, length above 9.5 mm. Black spots spread on whole elytral disc. N Philippines.
 *biradiata* (rare forms with reduced posterolateral spots on marginalia)
- Small species, length below 9.5 mm. Black elytral spots occur only behind postscutellar tubercle and in posthumeral area. S Malay Peninsula, Borneo, Sumatra, and Philippines (Palawan).
 *dulcicula*
40. Large species, length above 8.0 mm (usually above 8.5 mm). 41.
- Small species, length usually below 8.0 mm (occasionally to 8.5 mm). 42.
41. Humeral spot on marginalia distinct, usually dark coloured, elongate, extending to elytral margin (fig. 179). Elytral disc usually dark coloured, often with

- distinct dark pattern. Large, length 9.5 to 12.6 mm. Widespread in the Oriental Region except Philippines and eastern Indonesia.
- *dorsata*
- Humeral spot on marginalia usually indistinct, pale, usually not extending to elytral margin (fig. 248). Elytral disc usually paler coloured, occasionally with dark pattern usually only punctures, especially on sides of disc, with darker areola. Smaller, length to 10.0 mm. Widespread in the whole Oriental Region.
- *fuscopunctata* (rare form with humeral spots)
42. Elytral marginalia without sutural spot. 43.
- Elytral marginalia with sutural spot (figs 134-137). From N India to N Sumatra, rare.
- *chandrika*
43. Postscutellar tubercle high, angulate (figs 109, 205, 206). Elytral disc only occasionally with reticulate pattern. 44.
- Postscutellar tubercle low, obtuse (fig. 49). Elytral disc often with reticulate pattern. S Malay Pen., Sumatra, Java and Borneo.
- *assimilis* (form with only humeral spots)
44. Elytral pattern quite constant, on brown ground colour yellow spot in scutellar area and behind postscutellar tubercle (figs 138, 139). Usually larger, length 6.9-8.0 mm (usually above 7 mm). Aedeagus slim, not spoon-shaped (figs 74-76). Java and neighbouring islands.
- *biremis*
- Elytral pattern very variable, occasionally as in the precedent species (figs 211-220). Usually smaller, length 5.8-7.8 mm (usually below 7 mm). Aedeagus stout, spoon-shaped (figs 167-169). Widespread on the continent, rare on Sumatra and Palawan, only occasionally on Java.
- *furcata*
45. Elytral disc from uniformly yellow to mostly maculate, occasionally almost whole disc dark and then humeral spots of the same colour as the disc. 46.
- Elytral disc mostly black, humeral spots reddish-yellow. Endemic to Moluccas.
- *moluccana*
46. Inner pecten of claws shorter, extending at most to 1/3 length of claw (figs 104, 291, 470, 527, 533). 47.
- Inner pecten of claws longer, extending at least to 2/5 length of claw (figs 282, 405-407). 52.
47. Elytral pattern distinct, brown to black. 48.
- Elytral pattern indistinct, reddish-yellow, or whole disc uniformly yellow. 49.

48. Posterolateral spots on marginalia usually in form of isolated, circular spot in the middle of explanate margin, not extending to borders of disc and extreme margin of elytra. Dark spots spread on whole surface of disc, which is slightly irregular with a few shallow impressions (tab. 8: 4). Two to three last antennal segments infusate. Philippines.
 *biradiata*
- . Posterolateral spots on marginalia well developed, forms transverse bands extending from border of disc to extreme margin of elytra. Dark spots occupy no more than a half surface of the disc (fig. 524, tab. 8: 7). Except principal impressions, surface of disc appears perfectly regular. Antennae uniformly yellow or only last segment infusate. Borneo.
 *suavis*
49. Body stout, more circular in outline, L/W ratio 1.01-1.08 (figs 288, 467, 530). Humeral angles obtuse, elytral margin behind humeral angles not emarginate. Spots on marginalia well visible from above. Outside Timor island.
 50.
- . Body slimmer, more subtriangular in outline, L/W ratio 1.11-1.12 (fig. 549). Humeral angles well marked, elytral margin behind humeral shallowly emarginate. Spots on marginalia well visible only on under side of the marginalia. Endemic to Timor.
 *timorensis*
50. Elytra wide, rounded (figs 288, 530). Humeral angles broadly rounded. Elytral disc usually uniform, without pattern. Philippines.
 51.
- . Elytra slimmer, converging posterad (fig. 467). Humeral angles narrowly rounded. Elytral disc with yellowish-red pattern. Tenimber (Tanimbar) island of eastern Indonesia.
 *pacalis*
51. Larger, length 10.7-10.8 mm. One or two last antennal segments black. Spots on marginalia darker than the ground colour of elytral disc.
 *intermedia*
- . Smaller, length 8.5-10.0 mm. Antennae uniformly yellow. Spots of marginalia the same colour as elytral disc.
 *subcruciata*
52. Smaller species, length 5.8-8.6 mm. Elytral pattern variable.
 54.
- . Larger species, length 8.7-10.6 mm. Elytra yellow with small black spots.
 53.
53. Larger, length usually above 9.7 mm. Elytral spots numerous (figs 285, 286). Humeral angles heavily marked, subangulate, elytra abruptly convergent posterad. Apical part of aedeagus strongly curved ventrad (fig. 304). S Sunda Is.
 *inquinata*

- Smaller, length usually below 9.6 mm. Elytral disc with only few spots (figs 411, 412). Humeral angles slightly marked, rounded, elytra only gently convergent posterad. Apical part of aedeagus gently curved ventrad (fig 368). From NE India to Malaysia.
..... *musta*
- 54. Postscutellar tubercle low, obtuse (figs 49, 174, 513).
..... 55.
- Postscutellar tubercle higher, angulate (figs 37, 206, 263).
..... 57.
- 55. Species from eastern part of Palaearctic Region and China.
..... 56.
- Species from S Malay Pen., Sumatra, Java and Borneo.
..... *assimilis* (form with both humeral and posterolateral spots on marginalia)
- 56. Elytral disc densely punctured, especially in sutural and two submarginal rows. Elytral disc without pattern, punctures without areolae. Apical part of aedeagus gently curved ventrad (fig. 359). Only Guizhou Province of southern China.
..... *snizeki*
- Elytral disc sparsely punctured. Elytral disc usually with pattern, or at least part of punctures with dark areola. Apical third of aedeagus strongly curved ventrad (fig. 163). Eastern part of Palaearctic Region, south to C China and Taiwan.
..... *difformis*
- 57. Elytral disc with variable pattern, but usually without spots at posterior side of postscutellar tubercle, along suture, and in posthumeral part.
..... 59.
- Elytral disc with brown pattern, with spots on posterior side of postscutellar tubercle, along suture, and usually in posthumeral part.
..... 58.
- 58. Larger, length above 8.0 mm. Posthumeral spots absent or very narrow, not wider than one interval. From NE India to Malay Pen.
..... *musta*
- Smaller, length below 7.5 mm. Posthumeral spots broad, as wide as, or slightly wider than two intervals. Only Buru and Timor.
..... *toxopei*
- 59. Elytral puncturation coarse, especially in posthumeral part of disc. Aedeagus slim, not spoon-shaped (figs 298, 366, 367).
..... 60.
- Elytral puncturation finer, fine also in posthumeral part of disc. Aedeagus stout, spoon-shaped (figs 78, 79, 168, 169). Two very similar species, partly sympatric and then identifiable mostly by comparison with a series of properly identified specimens.
..... 61.

60. Usually larger, length 6.2-8.5 mm. Sexual dimorphism barely marked. Elytral puncturation slightly finer but denser. Mostly continental, rare on Sumatra and Palawan.

..... *indica*
 -. Usually smaller, length 5.9-8.0 mm. Sexual dimorphism well marked, males stouter than females with distinctly rounded apex of elytra. Elytral puncturation coarser but sparse, especially coarse in posthumeral part of disc. Mostly insular, common on Java, Bali, and Lombok, rare on Sumatra, on the continental Asia known only from Pahang province on Malay Pen.

..... *mutilata*
 61. Mostly continental common *Aspidomorpha*, rare on Sumatra and Palawan, extremely rare on Java. Body usually distinctly circular, puncturation behind humeral callus very fine. Elytral pattern and areolae surrounding elytral punctures yellow, yellow-brown to brown, rarely reddish.

..... *furcata* (rare form with posterolateral spots on elytra)
 -. Only insular species, common on S Sunda Is., rare in N Philippines and Moluccas (not recorded from Borneo). Body usually less circular in outline, puncturation behind humeral callus slightly coarser. Elytral pattern and areolae surrounding punctures usually reddish, occasionally brown. Elytra always with both humeral and posterolateral spots.

..... *amabilis*

***Aspidomorpha* (s. str.) *adhaerens* (WEBER, 1801)**

(figs 22-35, 67, 68, tab. 3: 1-3)

Cassida adhaerens WEBER, 1801: 51; FABRICIUS, 1801: 400; SCHÖNHERR, 1817: 222; BOISDUVAL, 1835: 539; ZIMSEN, 1964: 91.

Aspidomorpha adhaerens: BLANCHARD, 185 3: 318; BOHEMAN, 1854: 264, 1856: 108, 1862: 261; GEMMINGER and HAROLD, 1876: 3647; MASTERS, 1889: 998; SPAETH, 1903 a: 138, 1906 b: 37; 1914 e: 70; SIMON THOMAS, 1964: 167-264 (incl. fig., genetics); KIMOTO et al., 1984: 55.

Aspidomorpha (Aspidomorpha) adhaerens adhaerens: BOROWIEC, 1992: 130 (incl. fig.).

Aspidomorpha (Aspidomorpha) adhaerens: BOROWIEC, 1999: 178.

Aspidomorpha adhaerens subsp. *salomonina* SPAETH, 1919: 196; SIMON THOMAS, 1964: 256.

Aspidomorpha (Aspidomorpha) adhaerens salomonina: BOROWIEC, 1992: 130 (incl. fig.).

Cassida testudinaria MONTROUZIER, 1855: 67; BOHEMAN, 1856: 206.

Aspidomorpha testudinaria: BOHEMAN, 1862: 273; GEMMINGER and HAROLD, 1876: 3651.

Aspidomorpha adhaerens ssp. *testudinaria*: SPAETH, 1903 a: 138, 1906 b: 37, 1914 e: 70, 1926 a: 307.

Aspidomorpha Phyllis BOHEMAN, 1862: 274; GEMMINGER and HAROLD, 1876: 3650; SPAETH, 1903 a: 140.

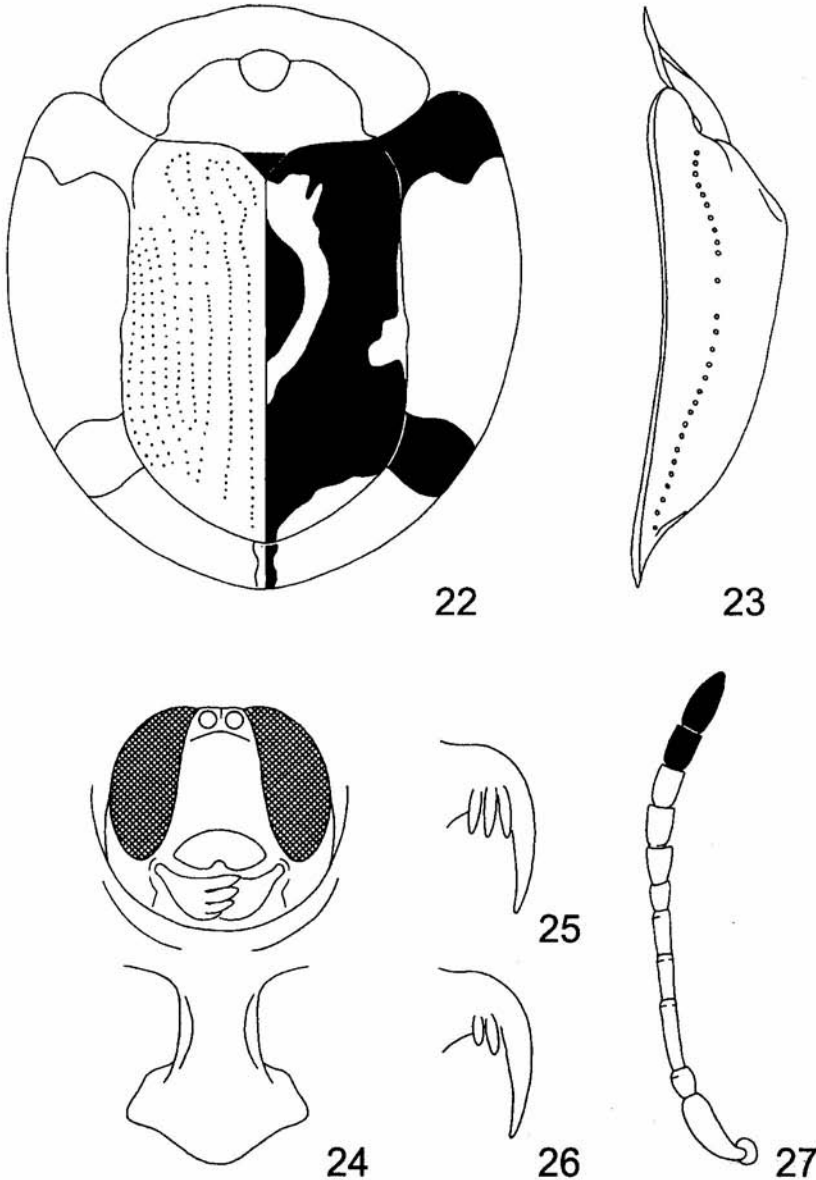
Aspidomorpha adhaerens var. *phyllis*: SPAETH, 1914 e: 70.

DIAGNOSIS

Distinguished by its black scutellum and unique polymorphism. *A. adhaerens* occurs generally in the Papuan Subregion, with only a few localities in eastern part of the Oriental Region.

DESCRIPTION

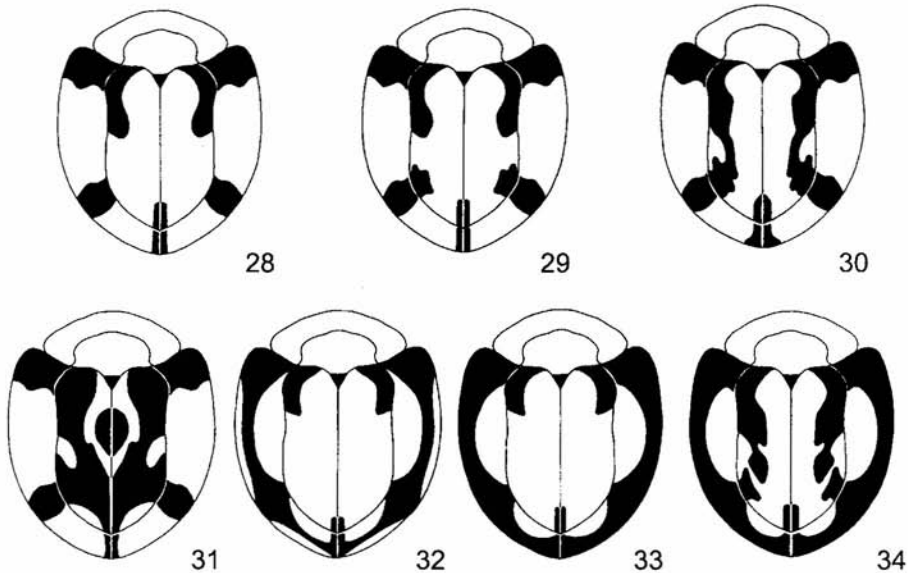
Male: L = 9.0-11.0; W = 8.0-10.1; Lp = 2.5-3.0; Wp = 5.5-6.5; L/W = 1.08-1.12; Wp/Lp = 2.09-2.20. Female: L = 10.1-12.5; W = 8.3-10.4; Lp = 2.6-3.2; Wp = 5.4-6.8; L/W = 1.17-1.24; Wp/Lp = 2.06-2.29. Body short-oval (fig. 22), apex



22-27. *Aspidimorpha adherens*: 22 - body in dorsal view, 23 - body in lateral view, 24 - head and prosternum, 25 - inner side of claw, 26 - outer side of claw, 27 - antenna

of elytra in male rounded, in female slightly acuminate. Sexual dimorphism distinct, male distinctly smaller and stouter than female.

Pronotum yellow, only forms from Solomon Islands with black spot at base of pronotum. Scutellum black. Elytral disc of the palest forms yellow with black basal margin, connected with large, black humeral spots on side of disc, along intervals (5)6-9, to $2/5$ length of elytra; also black elongate spot in posterior part of suture, from $4/5$ length to border of disc, connected with sutural spot of explanate margin of elytra (fig. 28). In some populations, there is a spot along intervals 6-9 close to base of posterolateral spots of marginalia (fig. 29); sometimes the spot is connected with posthumeral spots through a band along interval 5 (fig. 30). In the darkest form, almost whole disc is black, except for yellow ring around postscutellar tubercle, yellow spot on lateral fold of disc, and yellow transverse spots at apex along intervals 2 and 9 (fig. 31). Explanate margin of the palest form with humeral, posterolateral and sutural spots, humeral spots of explanate margin connected with humeral spots on disc (fig. 28-30). In dark forms, black spots on each elytron occupy large part of explanate margin except for two yellow windows and two yellow spots along extreme margin (fig. 32), in extreme case almost the whole surface of explanate margin is black except for two yellow windows (figs 33, 34). Forms with dark explanate margin have no spot on postscutellar part of disc (figs 32-34). The pattern is polymorphic as no intermediate forms were observed. Genetic relationships between all forms have been described in detail by SIMON THOMAS (1964). Ventrites and legs yellow. Antennae yellow, only two last segments black. Sometimes segment 9 more or less infusate.



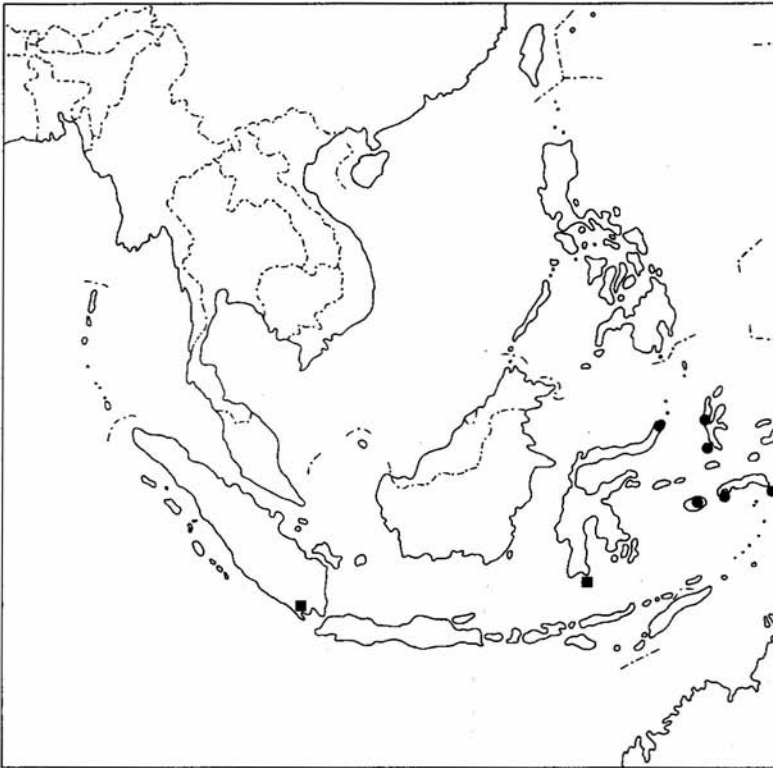
28-34. *Aspidimorpha adherens*: variation of dorsal pattern

Pronotum elliptical, 2.06-2.29 times wider than long, with maximum width in 1/3-2/5 basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra distinctly wider than base of pronotum. Humeral angles slightly protruding anterad, broadly rounded. Disc convex, with low, slightly conical postscutellar tubercle and distinct principal impressions (fig. 23). Punctuation moderately coarse, distinct on whole length of disc, regular. Intervals equal in width, about three times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura in male bare, in female with sparse, long, erect hairs.

Clypeus 1.4 times wider than long, in apical part with more or less distinct, oval impression. Labrum broad, emarginate to 1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig.24).

Length ratio of antennal segments: 100: 33: 86: 55: 53: 33: 44: 44: 47: 50: 80, segment 3 approximately 2.6 times longer than segment 2 and approximately 1.6 times longer than segment 4 (fig. 27).



35. Distribution of *Aspidimorpha adherens* (black circles) and *Aspidimorpha limbata* (black squares)

Claws with distinct pecten on both sides. Inner pecten with three teeth extending to 2/5 length of claw (fig. 25), outer pecten with two teeth extending to 1/3 length of claw (fig. 26).

Aedeagus slim, only slightly widened apically, apex slightly rounded with small apical process, ventral side without membrane (figs 67, 68).

TYPE MATERIAL

Cassida adhaerens: type lost.

Cassida testudinaria: lectotype and 3 paralectotypes "1133 *Aspidomorpha Deloyala testudinaria* Montr. Woodlark" (MNHN) – designated by BOROWIEC (1999).

Aspidomorpha phyllis: type not found. In Stockholm collection there is a specimen labelled as "*Phyllis* Bhn." and "type" but with locality label "Woodlark"; it is probably a syntype of *A. testudinaria* not of *A. phyllis* (type locality of *A. phyllis* is "Batschian").

Aspidomorpha adhaerens ssp. *salomonina*: 4 syntypes "Solomon Is." (MM).

DISTRIBUTION

Nominotypical subspecies occurs in Australia: Queensland and New Guinea, and in the Oriental Region only in eastern islands of Indonesia: northern Celebes, Moluccas, Buru, and Seram; ssp. *salomonina* is endemic to Solomon Is. (fig. 35).

Aspidomorpha (*s. str.*) *amabilis* BOHEMAN, 1854

(figs 36-47, 77-79, tab. 11: 7, 8)

Aspidomorpha amabilis BOHEMAN, 1854: 315, 1856: 115, 1862: 279; BALY, 1863: 14 (misidentification); GEMMINGER and HAROLD, 1876: 3648; WEISE, 1897: 104; MAULIK, 1916: 585; SPAETH, 1926 c: 118; HINCKS, 1953: 70; BOROWIEC, 1985: 27, 1990 a: 679; KIMOTO et al., 1995: 103 (incl. photo).

Aspidomorpha amabilis: BOROWIEC, 1996: 5.

Aspidomorpha (*Aspidomorpha*) *amabilis*: BOROWIEC, 1999: 179.

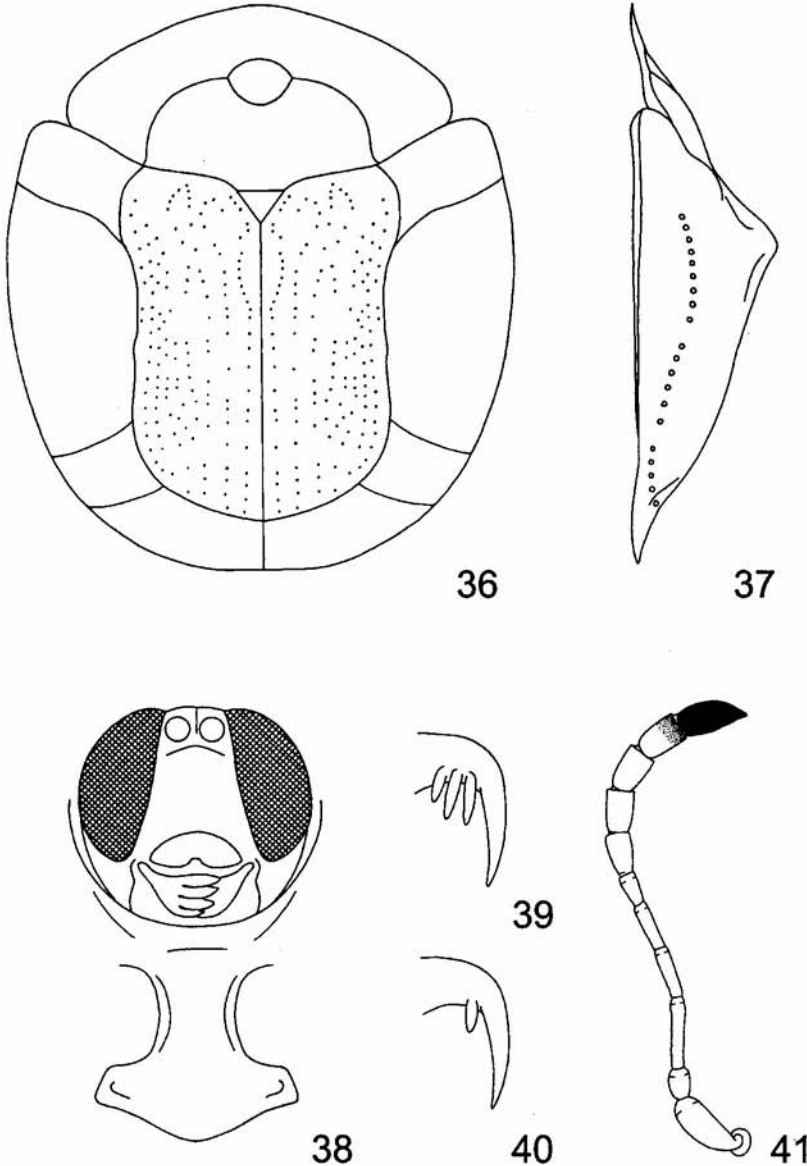
Aspidomorpha halmaherana SPAETH, 1926 a: 309; BOROWIEC, 1999: 179 (as syn. of *amabilis*).

Cassida micans: OLIVIER, 1808: 960; BOHEMAN, 1855: 522, 1856: 204, 1862: 487, not *C. micans* FABRICIUS, 1801; SPAETH, 1914 e: 68 (as syn. of *amabilis*).

DIAGNOSIS

A member of *A. furcata* group, which includes the smallest Oriental species of the genus, but similar also to the members of *A. indica* group. Explanate margin of *A. amabilis* elytra always with posterolateral spots, as in *A. difformis*, *A. indica*, *A. mutilata*, and *A. toxopei*. *A. difformis* differs in low and obtuse postscutellar tubercle, *A. toxopei* is stouter and has darker brownish pattern on elytral disc; puncturation of elytral disc, especially in posthumeral area, is distinctly coarser in *A. indica* and *A. mutilata* than it is in *A. amabilis*. A form of *A. assimilis* with posterolateral spots also is similar but differs in lower and obtuse postscutellar tubercle. All above mentioned species differ from *A. amabilis* in slimmer, not spoon-like aedeagus. The most similar to *A. amabilis* is a rare form of *A. furcata*

with posterolateral spots on explanate margin. Both species are partly sympatric (Sumatra, Java, Palawan) but in the overlapping part of the area *A. furcata* is very rare, while *A. amabilis* is one of the most common species. Male genitalia of both species are very similar, and some specimens are identifiable only by comparison with a series of properly identified specimens. The body pattern in *A. amabilis* is



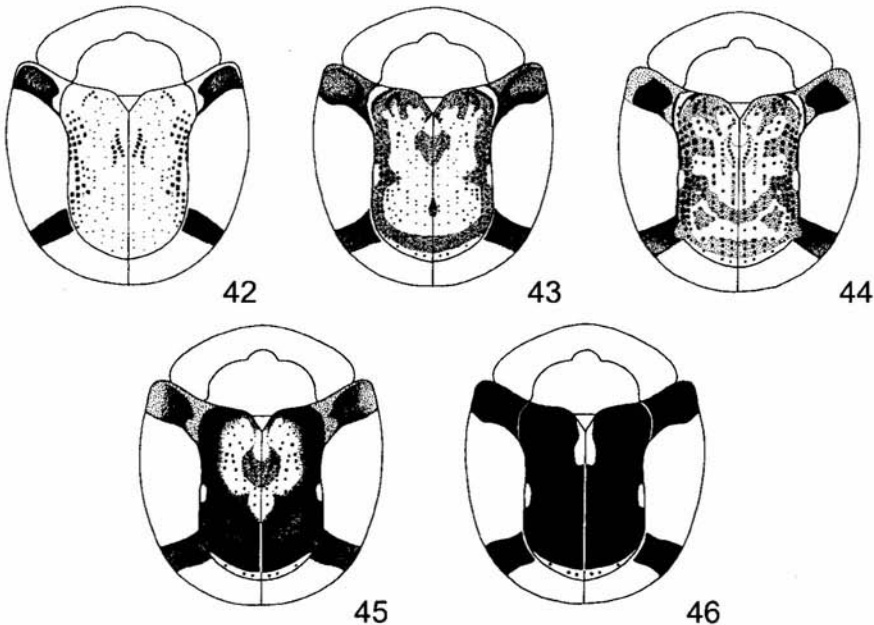
36-41. *Aspidimorpha amabilis*: 36 - body in dorsal view, 37 - body in lateral view, 38 - head and prosternum, 39 - inner side of claw, 40 - outer side of claw, 41 - antenna

more constant, usually more distinctly reddish than in *A. furcata*. Punctuation of sides of elytral disc in *A. amabilis* is slightly coarser than in *A. furcata*, but not as coarse as in *A. indica* and *A. mutilata*.

DESCRIPTION

L = 6.2-7.3; W = 5.3-6.3; Lp = 2.0-2.4; Wp = 3.8-4.6; L/W = 1.12-1.20; Wp/Lp = 1.81-1.95. Body almost circular (fig. 36). Sexual dimorphism indistinct, male smaller and stouter than female.

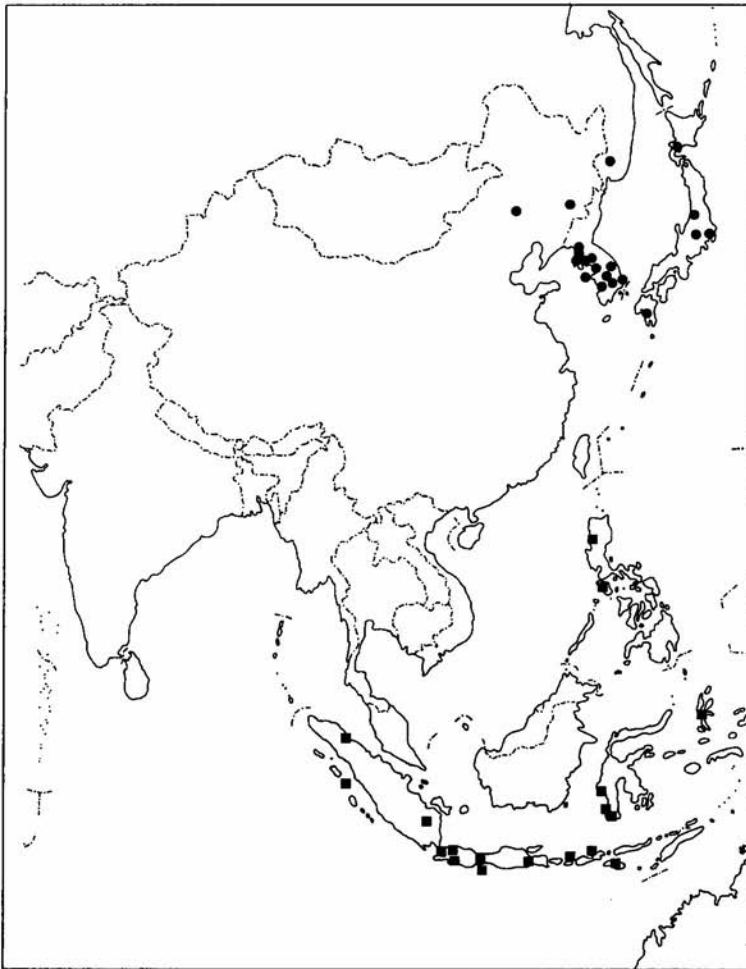
Pronotum and scutellum yellow. Disc of elytra yellow with reddish-brown to yellowish-brown pattern: spot on postscutellar tubercle, and elongate spot along side of disc connected with two transverse bands; one band V-shaped in 2/3 length of disc, and second band close to posterior border of disc. Usually punctures marked with reddish to brown areolae, especially those of anterior part and sides of disc (fig. 44). In rare pale forms, only punctures in anterior third of disc, on sides of disc and in 1/3, 2/3, and 3/4 length of suture distinctly marked with reddish to brown areola. Remaining punctures usually without areolae, only with dark centres (figs 42, 43). In rare dark forms, pattern increased to form a ring around disc, and large spot on postscutellar tubercle (fig. 45), occasionally whole disc is completely reddish-brown (fig. 46). Explanate margin with both humeral and posterolateral spots (figs 42-46), only occasionally without posterolateral spots. Spots of explanate margin reddish-brown to yellowish-brown, usually the same colour as pattern on the disc. Ventriles and legs yellow. Antennae yellow, last segment always black, penultimate segment usually infuscate to black.



42-46. *Aspidimorpha amabilis*: variation of dorsal pattern

Pronotum elliptical, 1.81-1.95 times wider than long, with maximum width in 1/3 basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra distinctly wider than base of pronotum. Humeral angles slightly protruding anterad, right angled. Disc moderately convex, with distinct, conical postscutellar tubercle (fig. 37) and shallow principal impressions. Puncturation fine to moderately coarse, distinct on whole length of disc but on slope sparser than on top of disc. Intervals equal in width, approximately three times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with very sparse, long, erect hairs, in old dried specimens hairs usually broken and surface of epipleura appears bare.



47. Distribution of *Aspdimorpha amabilis* (black squares) and *Aspdimorpha transparipennis* (black circles)

Clypeus 1.3 times wider than long, slightly convex, in apical half with more or less marked elongate impressions. Labrum broad, emarginate to 1/4-1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 38).

Length ratio of antennal segments: 100: 40: 100: 72: 68: 44: 59: 56: 56: 59: 93, segment 3 about 2.5 times longer than segment 2, and about 1.4 times longer than segment 4 (fig. 41).

Claws with distinct pecten on both sides. Inner pecten with three teeth extending to 2/5 length of claw (fig. 39), outer pecten with one tooth extending to 1/4 length of claw (fig. 40).

Aedeagus stout, spoon-shaped, apex broadly rounded, with obtuse apical process. Apical part curved ventrad, ventral side with distinct, longitudinally striated membrane (fig. 77-79).

TYPE MATERIAL

Aspidomorpha amabilis: lectotype "Java" "Germ." "Type" (NRS); paralectotype "Assam" "Westerm." (NRS) – designated by BOROWIEC (1999). Paralectotype from Assam belongs to *A. indica* BOH.

Aspidomorpha halmaherana: holotype: "Djilolo" "Asp. halmaherana m. Spaeth det." (MM).

DISTRIBUTION

Indonesia: Java, Lombok, Sulawesi, Sumatra, Sumba, Sumbawa, Philippines: Luzon, Mindoro, Palawan (fig. 47). The locality from Assam in India cited in several papers after BOHEMAN (1854) has been based on a misidentified syntype, which actually belongs to *Aspidomorpha indica*.

REMARKS

Holotype *A. halmaherana* is a rare aberration of *A. amabilis* with brownish elytral pattern.

***Aspidomorpha* (s. str.) *assimilis* BOHEMAN, 1854**

(figs 48-66, 80-82, tab. 12: 6-9)

Aspidomorpha assimilis BOHEMAN, 1854: 314, 1856: 114, 1862: 279; GEMMINGER and HAROLD, 1876: 3648; SPAETH, 1900: 23, 1904: 75, 1912: 117, 1914 e: 68, 1926 c: 118; MAULIK, 1916: 585; BOROWIEC, 1990 a: 679; MOHAMEDSAID, 1993: 46 (incl. colour photo), 1994: 369, 2000 a: 358; KIMOTO et al., 1995: 103.

Aspidomorpha assimilis: BOROWIEC, 1996: 6.

Aspidomorpha (*Aspidomorpha*) *assimilis*: BOROWIEC, 1999: 179.

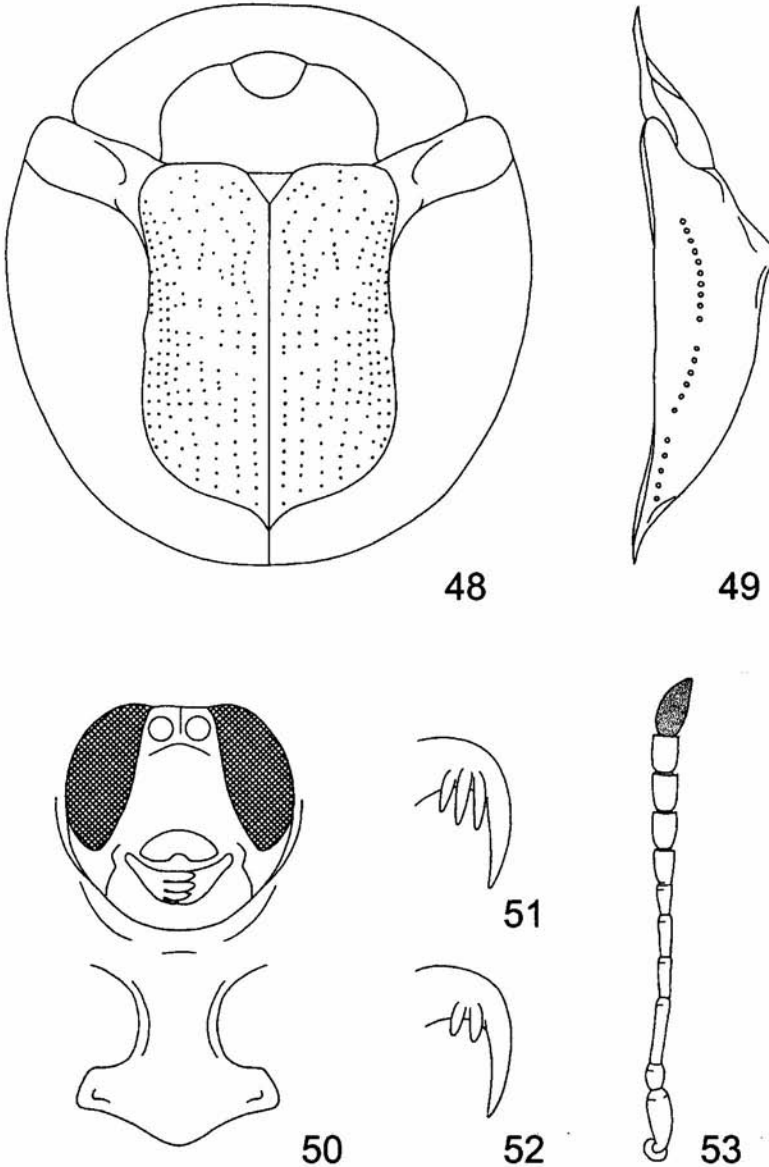
Aspidomorpha assimilis var. *elegantula* SPAETH, 1904: 75.

Aspidomorpha Vesta BOHEMAN, 1862: 279; GEMMINGER and HAROLD, 1876: 3651; SPAETH, 1914 e: 70.

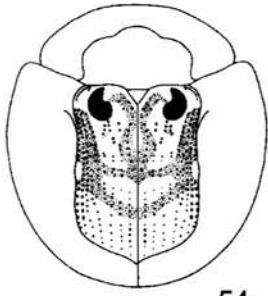
Aspidomorpha assimilis ab. *vesta*: SPAETH, 1926 c: 118.

DIAGNOSIS

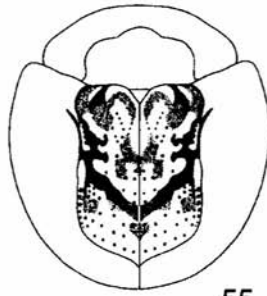
A member of *A. furcata* group, but can also be misidentified with species of *A. indica* group. Generally, differs from most species of both groups in low and obtuse postscutellar tubercle. Among species of both groups *A. assimilis* is the only one in which aberrations without spots, with only humeral spots, or with both



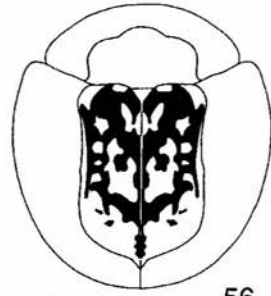
48-53. *Aspidimorpha assimilis*: 48 - body in dorsal view, 49 - body in lateral view, 50 - head and prosternum, 51 - inner side of claw, 52 - outer side of claw, 53 - antenna



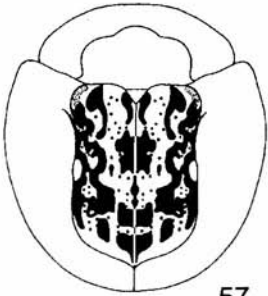
54



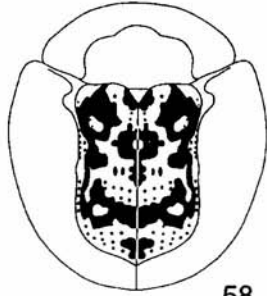
55



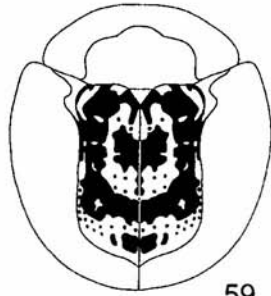
56



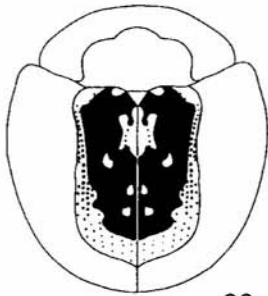
57



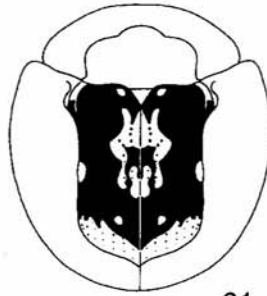
58



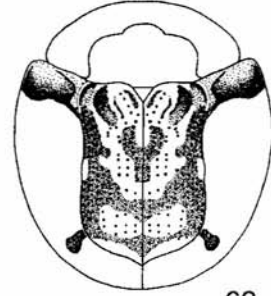
59



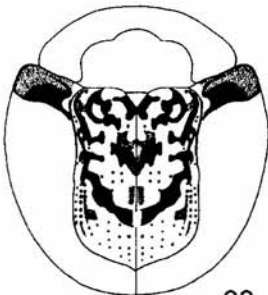
60



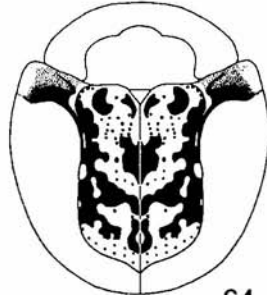
61



62



63



64



65

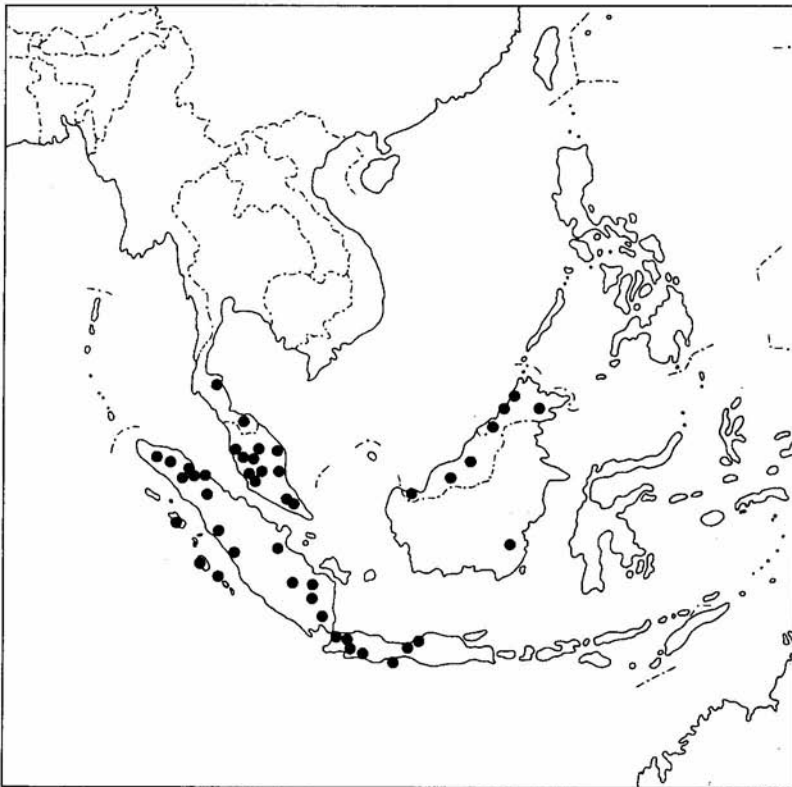
54-65. *Aspidomorpha assimilis*: variation of dorsal pattern

humeral and posterolateral spots on explanate margin of elytra occur. Many specimens of *A. assimilis* show a unique reticular pattern of elytral disc. *A. difformis* and *A. snizeki* share with *A. assimilis* low and obtuse postscutellar tubercle, but they are slimmer than *A. assimilis*, with L/W ratio usually around 1.18, while *A. assimilis* is more circular, with L/W ratio usually below 1.16. These three species are separated geographically, *A. difformis* and *A. snizeki* occur in China, Korea, Japan and Russian Far East, while *A. assimilis* is common in Sunda Is. and southern part of Malay Pen., with northern border of range in Thailand.

DESCRIPTION

L = 5.8-7.7; W = 5.3-6.7; Lp = 1.9-2.4; Wp = 3.8-4.7; L/W = 1.05-1.18; Wp/Lp = 1.83-2.05. Body almost circular (fig. 48), sexual dimorphism barely marked, male usually slightly smaller and stouter than female.

Pronotum and scutellum yellow. Disc of elytra yellow with punctures marked with yellowish-brown, dark-brown or black areolae, and with spots forming marble or reticulate pattern. Usually a distinct spot on postscutellar tubercle, triangular spot at basal margin of elytra on interval 4, and elongate spot on each side of disc; there are two transverse bands between these elongate spots, one



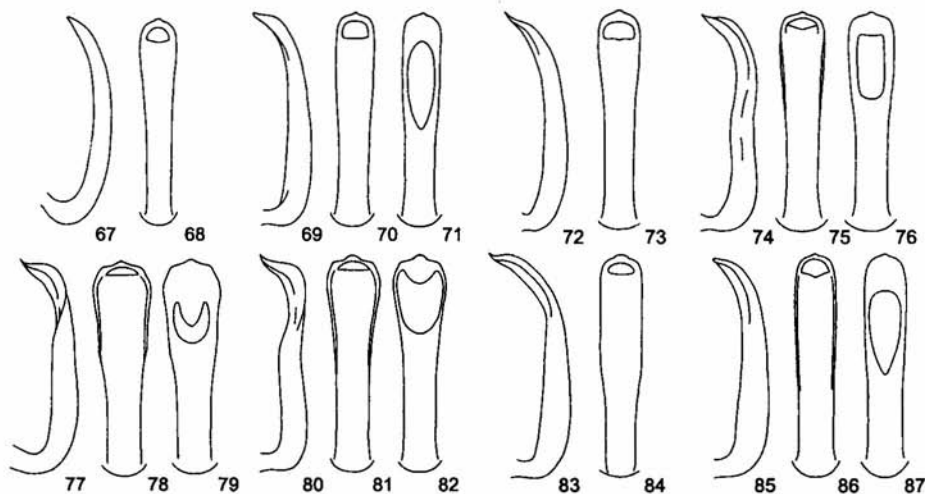
66. Distribution of *Aspidimorpha assimilis*

band in 1/3 length of disc, and another band in posterior half of disc. The pattern can be expanded to form a ring around disc, and a spot in the middle of postscutellar area. In extreme cases, the pattern forms black spot on almost whole surface of disc except for yellow ring around disc, yellow spot in postscutellar area, and small yellow spots on the top of disc. Explanate margin of elytra usually without spots, sometimes with humeral spots. Occasionally also short posterolateral spots, never extending to margin of elytra (fig. 54-65). Spots of explanate margin of elytra of the same colour as the pattern of disc. Ventrites and legs yellow. Antennae yellow, sometimes last segment infusate or completely black, rarely two last segments infusate to black.

Pronotum elliptical, 1.83-2.05 times wider than long, with maximum width in basal 1/3 length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra wider than base of pronotum. Humeral angles slightly protruding anterad, right angled. Disc of elytra convex, with low, broad and obtuse postscutellar tubercle (in some specimens barely marked), without impressions (fig. 49). Puncturation regular, moderately coarse, distinct on whole length of disc. Intervals of equal width, around three times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with sparse, long, erect hairs.

Clypeus approximately 1.5 times wider than long, in apical half with more or less distinct shallow impression. Labrum broad, emarginate to 1/4-1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 50).



67-87. Aedeagi: 67, 68 - *Aspidimorpha adherens*; 69-71 - *A. bataviana*; 72, 73 - *A. bilobata*; 74-76 - *A. biremis*; 77-79 - *A. amabilis*; 80-82 - *A. assimilis*; 83, 84 - *A. biradiata*; 85-87 - *A. birmanica*; 67, 69, 72, 74, 77, 80, 83, 85 - lateral; 68, 70, 73, 75, 78, 81, 84, 86 - dorsal; 71, 76, 79, 82, 87 - ventral

Length ratio of antennal segments: 100: 39: 107: 64: 68: 46: 53: 57: 57: 57: 100, segment 3 approximately 2.7 times longer than segment 2 and approximately 1.7 times than segment 4 (fig. 53).

Claws with distinct pecten on both sides. Inner pecten with three teeth extending to 2/5 length of claw (fig. 51), outer pecten with two teeth extending to 1/4 length of claw (fig. 52).

Aedeagus stout, spoon-shaped, apex broadly rounded, with moderately large and slightly obtuse apical process. Apical part curved ventrad. Ventral side with distinct, longitudinally striated membrane (figs 80-82).

TYPE MATERIAL

Aspidomorpha assimilis: lectotype "Java" "Ullrich" "Type" (NRS).

Aspidomorpha assimilis var. *elegantula*: syntype "Java" "typ" (MM).

Aspidomorpha vesta: holotype "Java Horsfield, BALY coll. 1905-54" "Type" (BMNH).

DISTRIBUTION

Indonesia: Borneo, Java, Nias, Sumatra; Malaysia: continental and insular in Sarawak on Borneo (fig. 66); Thailand.

Aspidomorpha (s. str.) *bataviana* n. sp.

(figs 88-93, 69-71, 372, tab. 5: 1, 2)

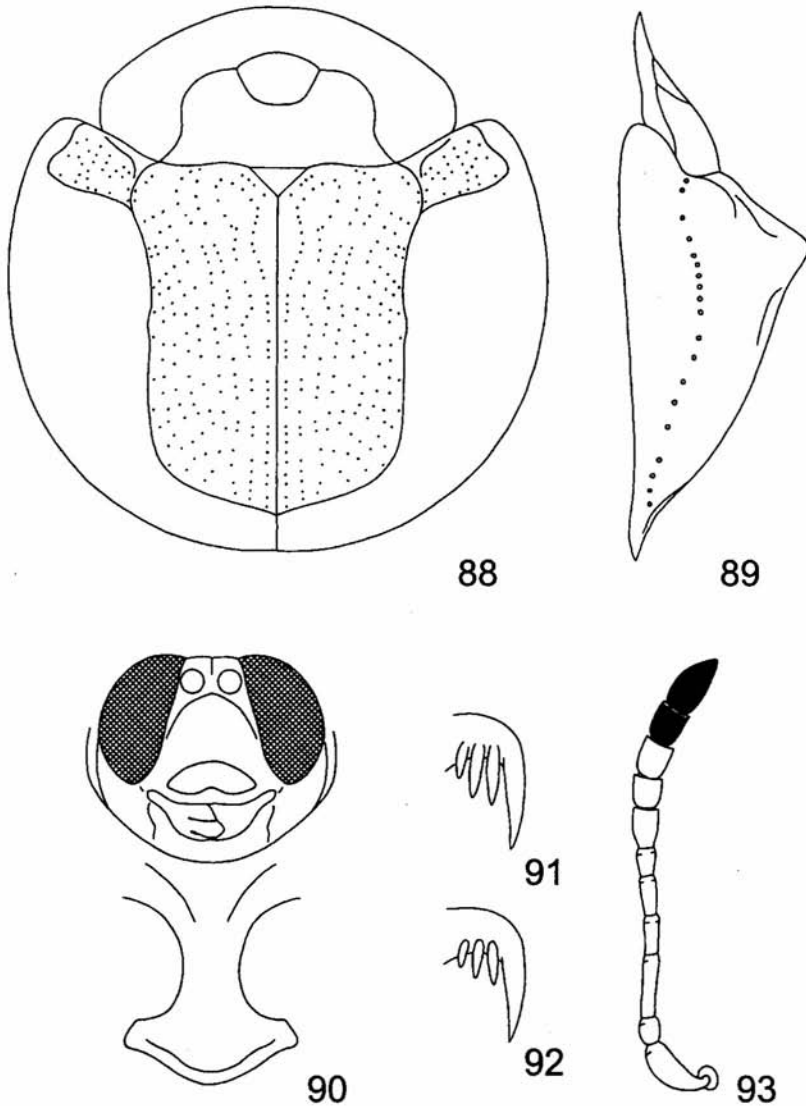
ETYMOLOGY

Named after its locus typicus, Batavia (the colonial Dutch name of the present capital of Indonesia, Jakarta).

DIAGNOSIS

A member of *A. sanctaecrucis* group. Its mandible, like in remaining species of this group, have cutting edge without teeth. At first glance it looks like a small specimen of *A. sanctaecrucis*. The largest specimens (females) of *A. bataviana* reach 11.5 mm, while the smallest specimens (males) of *A. sanctaecrucis* reach 10.0 mm, but in the mean length *A. bataviana* is almost half that of *A. sanctaecrucis*. *A. bataviana* is known from Java, Bali, and southern Borneo, while *A. sanctaecrucis* occurs mainly in continental Asia, with only few localities on Borneo. Records of *A. sanctaecrucis* from Java (confirmed by examined specimens!) probably are based on introduced specimens. Form of *A. sanctaecrucis* from Borneo has usually blackish spots on explanate margin of elytra, but this feature never appears in specimens of *A. bataviana*. Some forms of *A. bataviana* without spots on explanate margin of elytra are similar to the smallest specimens of *A. elevata*, which are sympatric in Sunda Is. However, on the average *A. elevata* is distinctly larger than *A. bataviana*, and has more distinct sexual dimorphism: especially males of *A. elevata* tend to form hypertrophic phenotypes with extremely broad

marginalia, while males of *A. bataviana* never do and have the same body proportions as females. Only one species of *A. sanctaecrucis* group, *A. inuncta* from south India, has similar size to *A. bataviana*; but *A. inuncta* is distinctly slimmer (L/W 1.16-1.25, in *A. bataviana* L/W 1.02-1.14), and their ground colour of elytron is greenishyellow, while in *A. bataviana* ground colour of elytra is yellow.



88-93. *Aspidimorpha bataviana*: 88 - body in dorsal view, 89 - body in lateral view, 90 - head and prothorax, 91 - inner side of claw, 92 - outer side of claw, 93 - antenna

DESCRIPTION

Male: $L = 8.1-9.9$; $W = 7.9-9.3$; $Lp = 2.8-3.3$; $Wp = 5.1-6.4$; $L/W = 1.02-1.11$; $Wp/Lp = 1.82-1.94$; Female: $L = 10.0-11.5$; $W = 8.9-10.2$; $Lp = 3.2-3.7$; $Wp = 6.2-7.2$; $L/W = 1.09-1.14$; $Wp/Lp = 1.82-2.03$. Body circular (fig. 88), sexual dimorphism distinct, male distinctly smaller and stouter than female.

Pronotum, scutellum and disc of elytra yellow to yellowish-brown. Explanate margin of elytra with dark yellow to yellowish-brown humeral and posterolateral spots, extending to extreme margin, or humeral spots extend only to 2/3 width of explanate margin and posterolateral spots extend to 1/3 width of explanate margin, occasionally posterolateral spots obsolete. Ventrites and legs yellow. Antennae yellow, two last segments black.

Pronotum elliptical, 1.82-2.03 times wider than long, with maximum width in 1/3 basal length, sides narrowly rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra distinctly wider than base of pronotum. Humeral angles right but blunt. Disc of elytra strongly convex, with large, conical postscutellar tubercle (fig. 89), and shallow postscutellar impressions, bordered by fold, and distinct principal impressions but without lateral impressions. Puncturation regular, moderately coarse, distinct along whole length of disc, but 2-5 punctures in a row tend to be grouped by together. In anterior half of the second interval there are sometimes additional, scattered punctures. Intervals mostly equal in width, three times wider than punctures. Surface of intervals glabrous and shiny. Surface of disc, slightly irregular, especially in anterior part. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with sparse, erect hairs.

Clypeus 1.5 times wider than long, shallowly impressed. Labrum broad, shallowly emarginate to 1/5 length. Mandibles with cutting edge, without teeth. Prosternal process rhomboidal, moderately wide, with shallow impression in the middle (fig. 90).

Length ratio of antennal segments: 100: 35: 85: 56: 56: 38: 56: 41: 47: 50: 85, segment 3 approximately 2.4 times longer than segment 2 and approximately 1.5 times than segment 4 (fig. 93).

Claws with distinct pecten on both sides. Inner pecten with three teeth extending to half length of claw, last tooth approximately twice shorter than remaining teeth (fig. 91). Outer pecten with three teeth, first tooth extending to 2/5 length of claw, following teeth gradually shorter (fig. 92).

Aedeagus slim, slightly widened apically, apex broadly rounded, with slightly marked apical process. Apical part curved ventrad. Ventral side with distinct, longitudinally striated membrane (figs 69-71).

TYPE MATERIAL

Holotype: "Batavia, 19-8-1947, C. v. Nidek" (ITZ); 10 paratypes: "Batavia, VIII-1947, C. v. Nidek" (ITZ, LB); paratype: "Batavia, 17-8-1947, C. v. Nidek" (LB); 2 paratypes: "Batavia, 19-8-1947, C. v. Nidek" (LB); 8 paratypes: "Batavia, 19-VIII-1947, C. v. Nidek" (ITZ); 15 paratypes: "Batavia, IX-1947, C. v. Nidek" (ITZ, LB); 6 paratypes: "Batavia, X-1947, C. v. Nidek" (ITZ, LB); 4 paratypes: "Batavia, 10-XI-1947, C. v. Nidek" (ITZ, LB); paratype: "Batavia, XII-1947, C. v. Nidek" (ITZ); 5

paratypes: "Batavia, Juli-48, C. v. Nidek" (ITZ, LB); paratype: "Java, Bogor, 28.X.1965" "J. Stusak Collector Bishop" (BM); 2 paratypes: "Batavia, Java, Blaisdell collection" (CAS); paratype: "Java, Buitenzorg, III-09, Bryant & Palmer (CAS); 15 paratypes: "Indonesia, nord Bali, Ile Sepanjang, 1910 J. Waterstradt" (LB); 63 paratypes: "Indonesia: nord Bali, Ile Sepanjang, Le Moul't vendit" (IRSN); paratype: "Indonesia, W jawa, S Djakarta X.1995, 20 m, S. jakl leg. (MS); 3 paratypes: "Borneo" (MCZ).

DISTRIBUTION

Indonesia: Java, Bali and Borneo (fig. 372).

REMARKS

The relationships between *A. bataviana*, *A. elevata*, and *A. sanctaerucis* need to be determined by genetic and bionomical studies. Some specimens of intermediate appearance suggest a possibility to hybridization between these taxa. See also remarks under *A. elevata* and *A. sanctaerucis*.

Aspidimorpha (s. str.) *bilobata* BOHEMAN, 1856

(figs 72, 73, 94-100, tab. 10: 7)

Aspidomorpha bilobata BOHEMAN, 1856: 111, 1862: 269; GEMMINGER and HAROLD, 1876: 3648; SPAETH, 1914 c: 68; BOROWIEC, 1990 a: 680.

Aspidimorpha bilobata: BOROWIEC, 1996: 6.

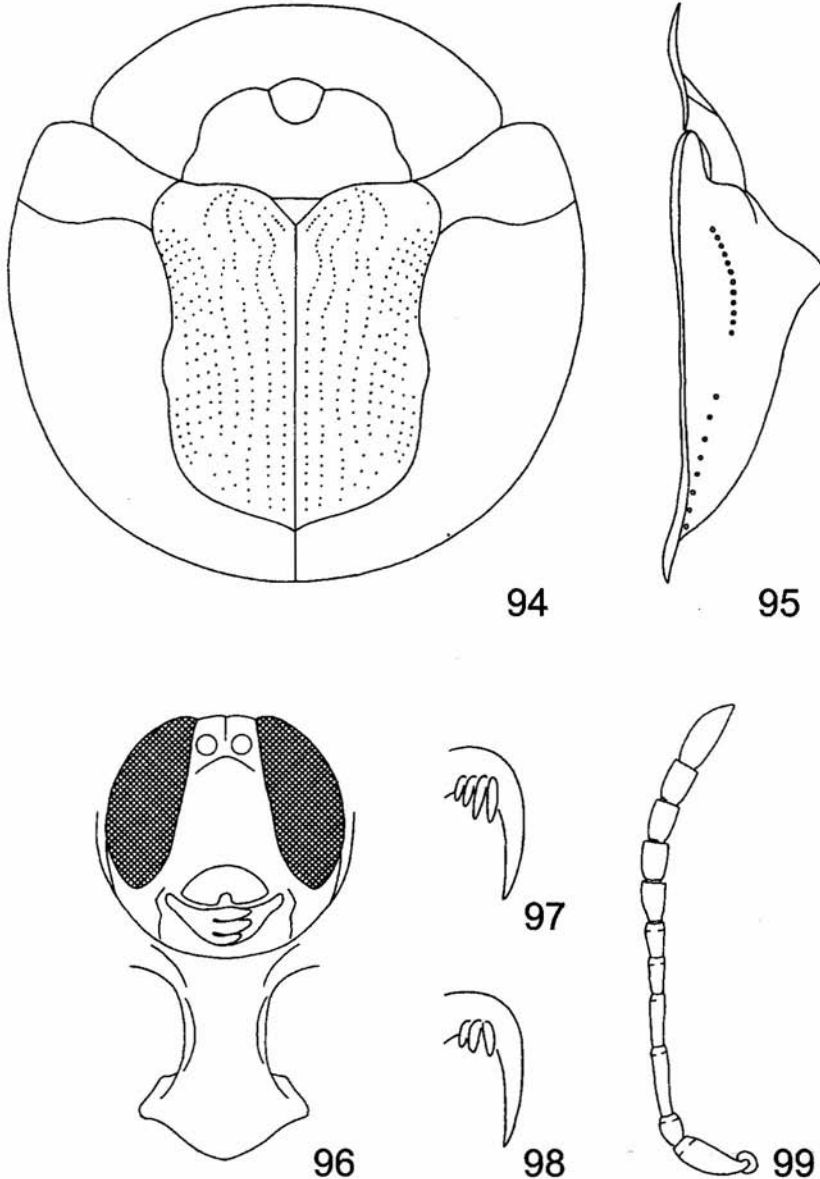
Aspidimorpha (*Aspidimorpha*) *bilobata*: BOROWIEC, 1999: 181.

DIAGNOSIS

A member of *A. dorsata* group, which comprises moderately sized species with distinct conical postscutellar tubercle. As three other species, *A. biradiata* (part), *A. dulcicula* and *A. luzonica*, *A. bilobata* has only humeral spots on explanate margin of elytra and short inner pecten on claws extending at most to 1/3 length of claw. These species are limited mostly to the Philippines and western part of Sunda Is., only *A. dulcicula* is distributed also on the continent, in southern part of Malay Pen. The most distinct is *A. biradiata*, which usually has also posterolateral spots on explanate margin of elytra. Specimens of *A. biradiata* without posterolateral spots differ from *A. bilobata* in brownish to black spots spread over the whole surface of elytral disc (in extreme case only punctures have dark areola), while elytral disc of *A. bilobata* is always without dark spots. Also *A. dulcicula* differs from *A. bilobata* in dark pattern on elytral disc, with black spot behind postscutellar tubercle and black, elongate spot behind humeral callus. The most similar species is the uniformly coloured *A. luzonica*, which differs in black last antennal segment, while *A. bilobata* has the antennae uniformly yellow. Humeral angles of *A. luzonica* are distinctly marked because of shallowly emarginate extreme margin of elytra behind the angle, while in *A. bilobata* the margin is without emargination and humeral angles are distinctly rounded.

DESCRIPTION

Male: L = 9.8-10.6; W = 9.5-11.0; Lp = 2.9-3.6; Wp = 6.1-7.5; L/W = 0.96-1.03; Wp/Lp = 2.00-2.14; Female: L = 10.1-11.5; W = 9.9-11.0; Lp = 3.3-3.7; Wp = 7.1-7.6; L/W = 0.97-1.05; Wp/Lp = 2.00-2.18. Body circular (fig. 94), sexual dimorphism barely marked, male slightly smaller and stouter than female.

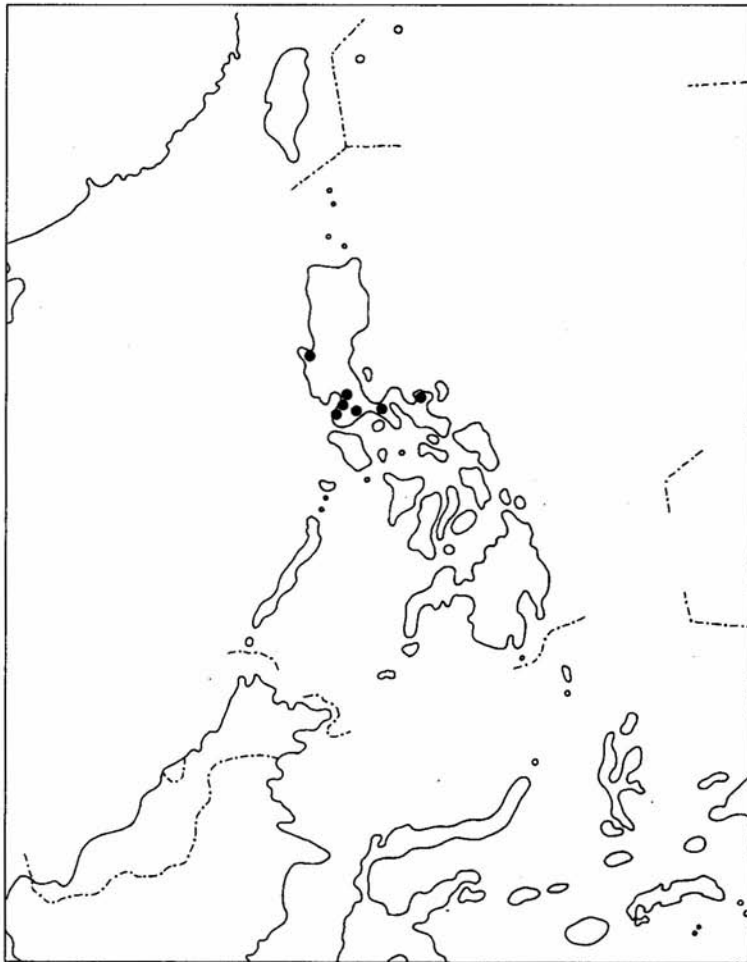


94-99. *Aspidimorpha bilobata*: 94 - body in dorsal view, 95 - body in lateral view, 96 - head and prothorax, 97 - inner side of claw, 98 - outer side of claw, 99 - antenna

Pronotum and scutellum yellow to yellowish-brown. Disc of elytra yellow to yellowish-brown, rarely reddish-brown. Explanate margin of elytra with complete, yellowish-brown to reddish-brown humeral spots. Ventrites and legs yellow. Antennae uniformly yellow.

Pronotum elliptical, approximately twice wider than long, with maximum width in $2/3$ basal length, sides narrowly rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra distinctly wider than base of pronotum. Humeral angles rounded. Disc of elytra convex, with large, conical postscutellar tubercle (fig. 95), with principal impressions, but without postscutellar and lateral impressions. Punctuation regular, moderately coarse, distinct along whole length of disc. Intervals of equal width, approximately five times wider than punctures. Surface



100. Distribution of *Aspidimorpha bilobata*

of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura pubescent.

Clypeus approximately 1.2 times wider than long, slightly convex. Labrum broad, emarginate to 1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 96).

Length ratio of antennal segments: 100: 40: 94: 72: 50: 47: 53: 50: 56: 56: 106, segment 3 approximately 2.4 times longer than segment 2 and approximately 1.3 times than segment 4 (fig. 99).

Claws with pecten on both sides. Inner pecten with four teeth, two first extending to 1/3 length of claw, two next twice shorter (fig. 97). Outer pecten with three equal teeth extending to 1/5 length of claw (fig. 98).

Aedeagus slim, slightly widened apically, apex broadly rounded, with obtuse apical process. Apical part curved ventrad. Ventral side without membrane (fig. 72, 73).

TYPE MATERIAL

Holotype: "Manilla" "Type" (NRS).

DISTRIBUTION

Philippines: Luzon (fig. 100).

***Aspidomorpha* (s. str.) *biradiata* BOHEMAN, 1854**

(figs 83, 84, 101-107, tab. 8: 4)

Aspidomorpha biradiata BOHEMAN, 1854: 292, 1856: 112, 1862: 270; GEMMINGER and HAROLD, 1876: 3648; SPAETH, 1914 e: 68; BOROWIEC, 1990 a: 680.

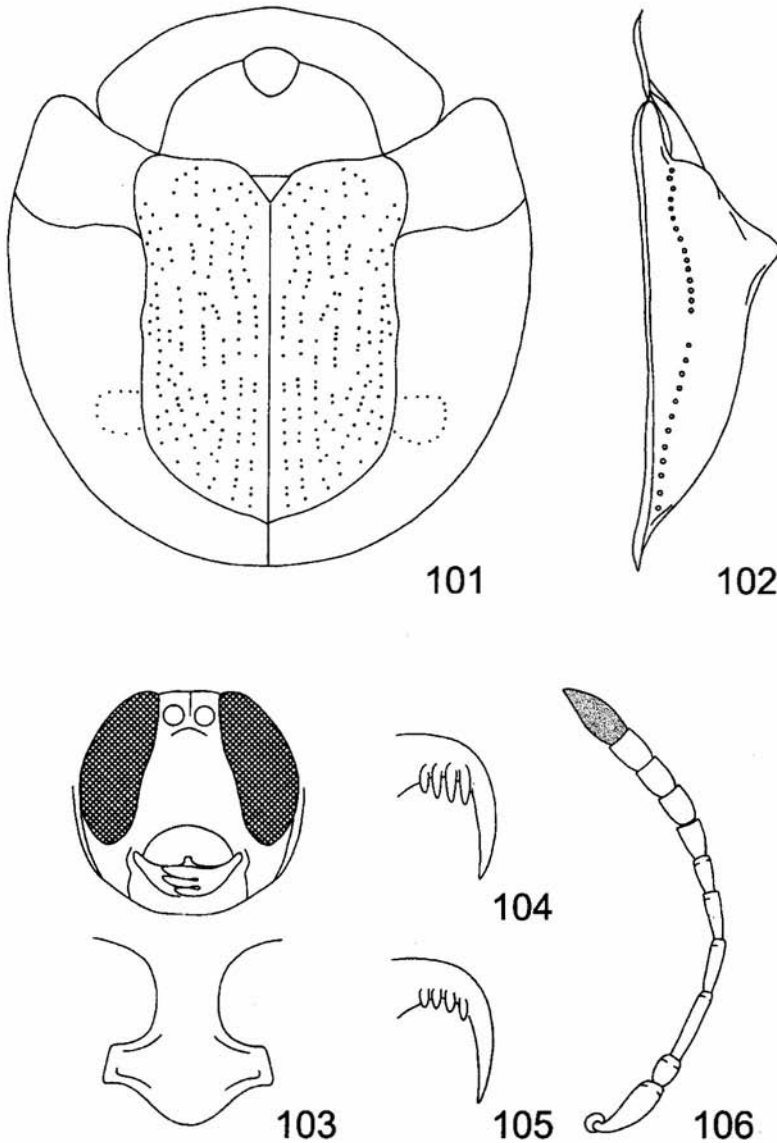
Aspidomorpha (*Aspidomorpha*) *biradiata*: BOROWIEC, 1999: 181.

DIAGNOSIS

A member of *A. dorsata* group, and by its body shape and elytral pattern very similar to *A. limbata*. Both are the slimmest species of the group, but *A. limbata* is always without spots on explanate margin, while *A. biradiata* has at least humeral spots and more or less marked posterolateral spots. A form of *A. biradiata* without posterolateral spots on explanate margin is similar to dark specimens of *A. dorsata*, but differs in short inner pecten of claws extending only to 1/3 length of claw (at least to 2/5 in *A. dorsata*). Typical form with posterolateral spots on explanate margin differs from relatives in short pecten of claws and dark spots on elytral disc. Only *A. suavis* also has distinct dark pattern of elytral disc, but it occupies not more than a half of elytra surface (in *A. biradiata* dark occupies more than 2/3 of disc surface). In *A. biradiata* posterolateral spots are usually circular, placed in the middle width of explanate margin, and often do not extend either to border of disc or to extreme margin of elytra, while in *A. suavis* the spots form transverse bands between border of disc and extreme margin of elytra. In *A. biradiata* two last antennal segments are infuscate, while in *A. suavis* antennae are usually uniformly yellow or only last segment is slightly infuscate.

DESCRIPTION

Male: L = 9.8-11.3; W = 8.9-9.9; Lp = 3.0-3.1; Wp = 5.9-6.2; L/W = 0.99-1.13; Wp/Lp = 1.93-2.0; Female: L = 10.7-11.3; W = 9.0-9.8; L/W = 1.15-1.18; Lp = 2.9-3.3; Wp = 6.2-6.6; Wp/Lp = 2.0-2.13. Body broadly-oval (fig. 101), sexual dimorphism barely marked, male slightly stouter than female.

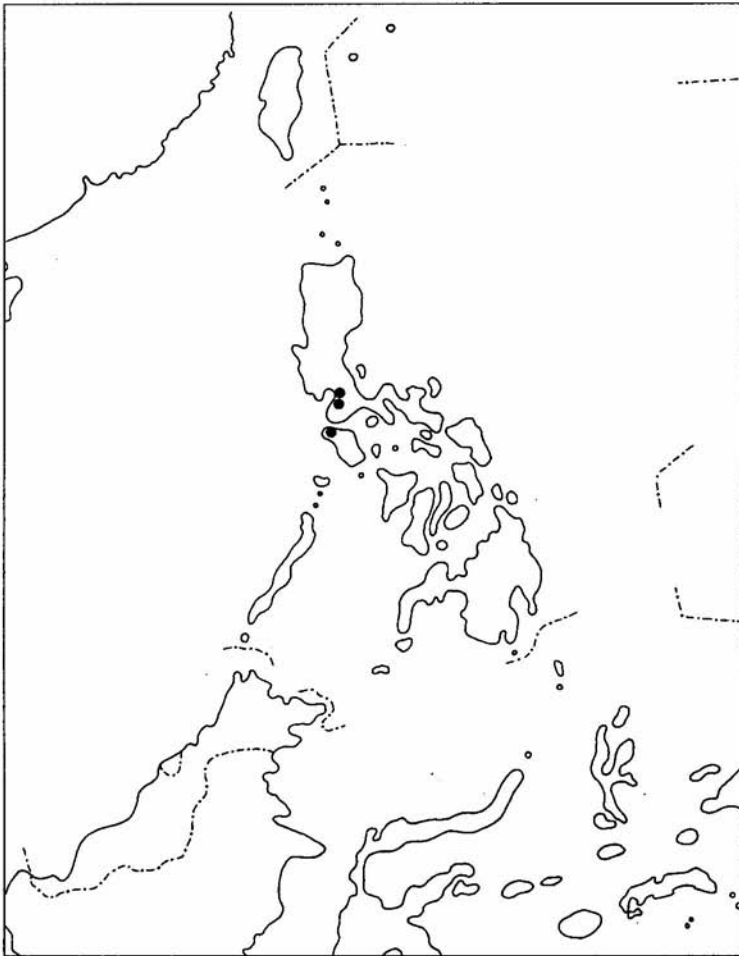


101-106. *Aspidimorpha biradiata*: 101 - body in dorsal view, 102 - body in lateral view, 103 - head and prosternum, 104 - inner side of claw, 105 - outer side of claw, 106 - antenna

Pronotum and scutellum yellow. Disc of elytra yellow with punctures marked with brown or black areola, on sides and in posterior part of disc the areolae can expand and partly coalesce. Explanate margin of elytra with brown or black humeral spots and usually with posterolateral spots, which never extend to extreme margin. Occasionally, explanate margin without posterolateral spots. Ventrites and legs yellow. Antennae yellow, last segment infuscate or black.

Pronotum elliptical, 1.93-2.13 times wider than long, with maximum width in middle, sides broadly rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra distinctly wider than base of pronotum. Humeral angles rounded, protruding anterad. Disc of elytra convex, with large, conical postscutellar tubercle (fig. 102), with principal impressions, but without postscutellar and lateral



107. Distribution of *Aspidimorpha biradiata*

impressions. Puncturation regular, moderately coarse, distinct on whole length of disc. Intervals equal in width, three to four times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura pubescent.

Clypeus as wide as long, slightly convex, without impression. Labrum broad, emarginate to 1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 103).

Length ratio of antennal segments: 100: 41: 94: 70: 62: 50: 44: 50: 50: 100, segment 3 approximately 2.3 times longer than segment 2 and approximately 1.3 times than segment 4 (fig. 106).

Claws with distinct pecten on both sides. Inner pecten with four teeth extending to 1/3 length of claw (fig. 104), outer pecten with four teeth extending to 1/5-1/4 length of claw (fig. 105).

Aedeagus slim, slightly widened apically, apex broadly rounded, with broad, obtuse apical process. Apical part curved ventrad. Ventral side without membrane (fig. 83, 84).

TYPE MATERIAL

Lectotype: "Manilla" "Westerm." "Type" (NRS) – designated by BOROWIEC (1999); 2 paralectotypes: "Manila Hagen" "biradiata Bhn." "29298" (ZMHU).

DISTRIBUTION

Philippines: Luzon.

Aspidomorpha (s. str.) *biremis* BOHEMAN, 1854

(figs 74-76, 108-114, 138, 139, tab. 11: 6)

Aspidomorpha biremis BOHEMAN, 1854: 319, 1856: 115, 1862: 280; GEMMINGER and HAROLD, 1876: 3648; SPAETH, 1914 c: 68; BOROWIEC, 1990 a: 680; KIMOTO et al., 1995: 103.

Aspidomorpha biremis: BOROWIEC, 1996: 6.

Aspidomorpha biramis [sic]: REID, 1998: 302.

Aspidomorpha (Aspidomorpha) biremis: BOROWIEC, 1999: 182.

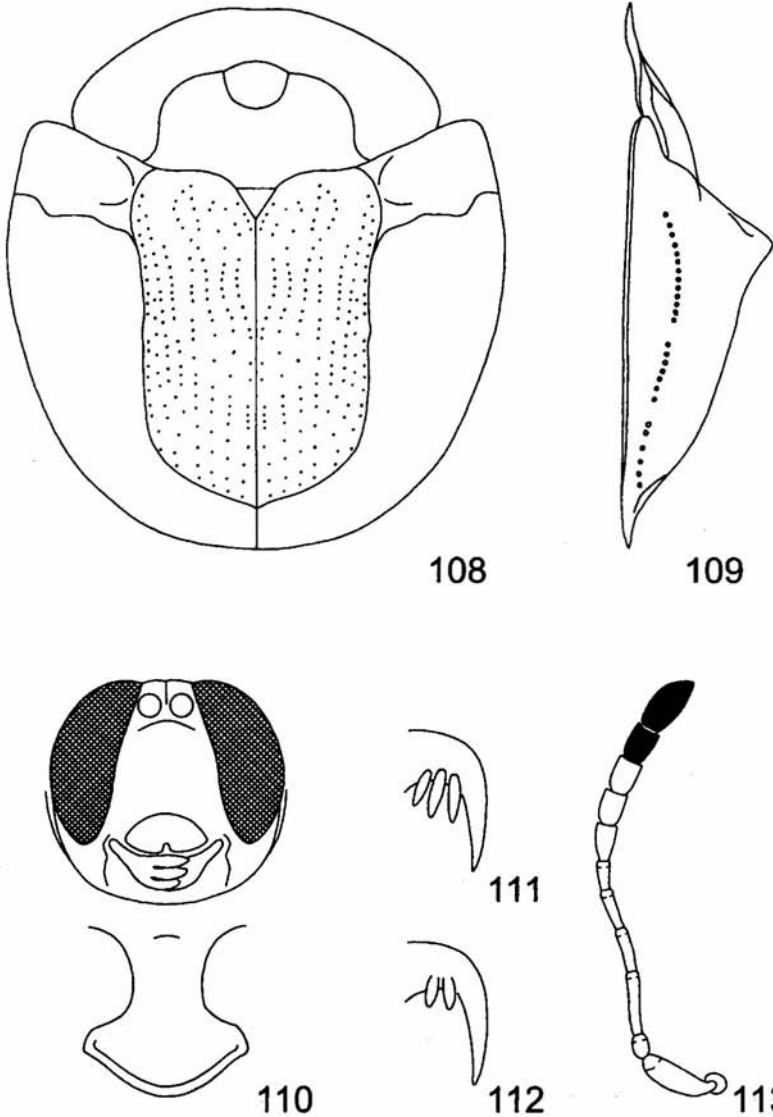
DIAGNOSIS

A member of *A. indica* group, of small size approaching the *A. furcata* group. A constant colour pattern which is similar only to that found in rare forms of *A. furcata* and *A. chandrika*, but *A. chandrika* distinctly differs in presence of sutural spot on explanate margin (absent in *A. biremis* and *A. furcata*). The most important feature, which distinguishes *A. biremis* from *A. furcata*, is the structure of aedeagus. Aedeagus of *A. biremis*, like in other species from *A. indica* group, is slim and only at the top slightly widened, without membrane on ventral side, while in *A. furcata* aedeagus is distinctly widened apically, spoon-shaped, with striate membrane on ventral side. In *A. furcata* pattern on elytral disc is variable, and only in exceptional cases looks like in *A. biremis*. Both species are partly sympatric on Java, but *A. biremis* is common on the island, while *A. furcata* extremely rare.

DESCRIPTION

L = 6.9-8.0; W = 5.9-7.0; L/W = 1.10-1.17; Lp = 2.3-2.6; Wp = 4.4-5.2; Wp/Lp = 1.91-2.0. Body circular (fig. 108), no sexual dimorphism.

Pronotum and scutellum yellow. Disc of elytra yellow with constant reddish-brown, brown, or darkly-brown pattern. In paler forms pattern composed of a spot in 1/3 length of disc on intervals 1-3, a tear-shaped spot in anterior part of disc on

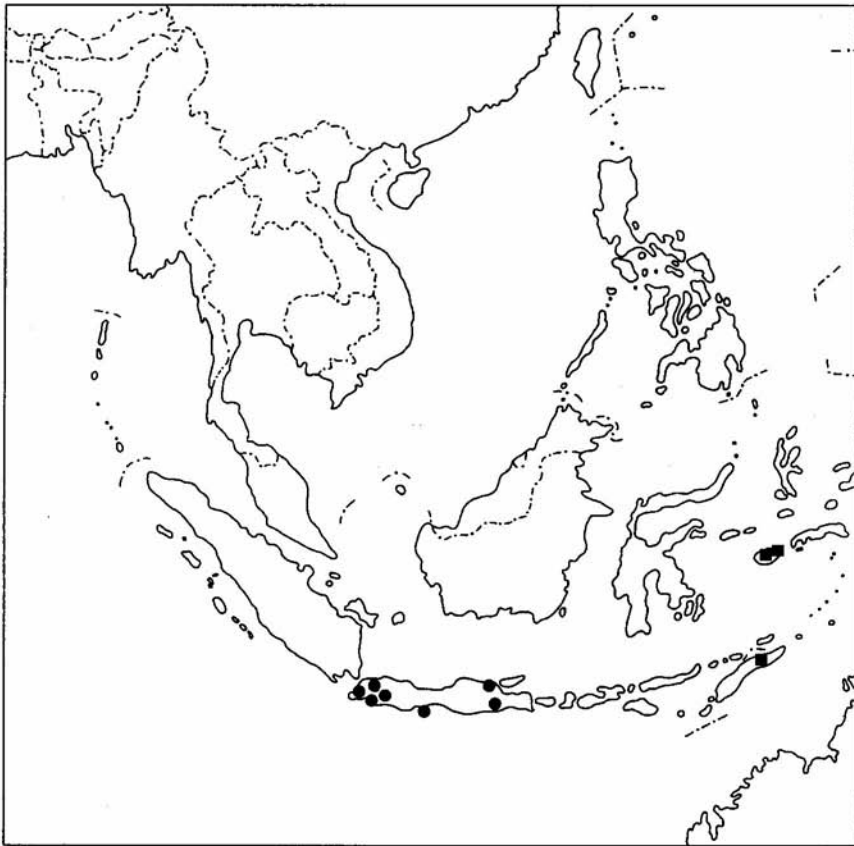


108-113. *Aspidimorpha biremis*: 108 - body in dorsal view, 109 - body in lateral view, 110 - head and prothorax, 111 - inner side of claw, 112 - outer side of claw, 113 - antenna

interval 4, and an elongate spot on side of disc along intervals 5-9. These elongate spots along each side of disc are connected with two transverse bands, one V-shaped in 2/3 length of disc and another in apical part of disc. In darker forms spots larger and pattern composed of two broad, transverse bands, one in 1/3 length of disc and another in apical part of disc. Explanate margin of elytra with humeral spots, paler at anterior margin of elytra, gradually darker posterad, and always without posterolateral spots (figs 138, 139). Ventrites and legs yellow. Antennae mostly yellow, two last segments black, sometimes base of penultimate segment yellow.

Pronotum elliptical, approximately 1.91-2.00 times wider than long, with maximum width in 1/3 basal length, sides narrowly rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra distinctly wider than base of pronotum. Humeral angles slightly protruding anterad, right angled. Disc of elytra convex, with distinct, conical postscutellar tubercle (fig. 109), distinct principal impressions, and without



114. Distribution of *Aspidimorpha biremis* (black circles) and *toxopei* (black squares)

postscutellar and lateral impressions. Puncturation regular, moderately coarse, and distinctly sparser on slope. Intervals equal in width, approximately five times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura pubescent.

Clypeus approximately 1.2 times wider than long, with shallow impression on the top. Labrum broad, emarginate to 1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 110).

Length ratio of antennal segments: 100: 30: 83: 55: 36: 47: 44: 44: 83, segment 3 approximately 2.8 times longer than segment 2 and approximately 1.4 times than segment 4 (fig. 113).

Claws with pecten on both sides. Inner pecten with three teeth, extending to half length of claw (fig. 111). Outer pecten with two teeth extending to 1/3 length of claw (fig. 112).

Aedeagus slim, slightly widened apically, apex broadly rounded, with moderately large, obtuse apical process. Apical part moderately curved ventrad. Ventral side without membrane (fig. 74-76).

TYPE MATERIAL

Holotype: "Java" "Bhn" "Type" (NRS).

DISTRIBUTION

Indonesia: Java and adjacent islands (fig. 114).

Aspidomorpha (s. str.) *birmanica* SPAETH, 1914

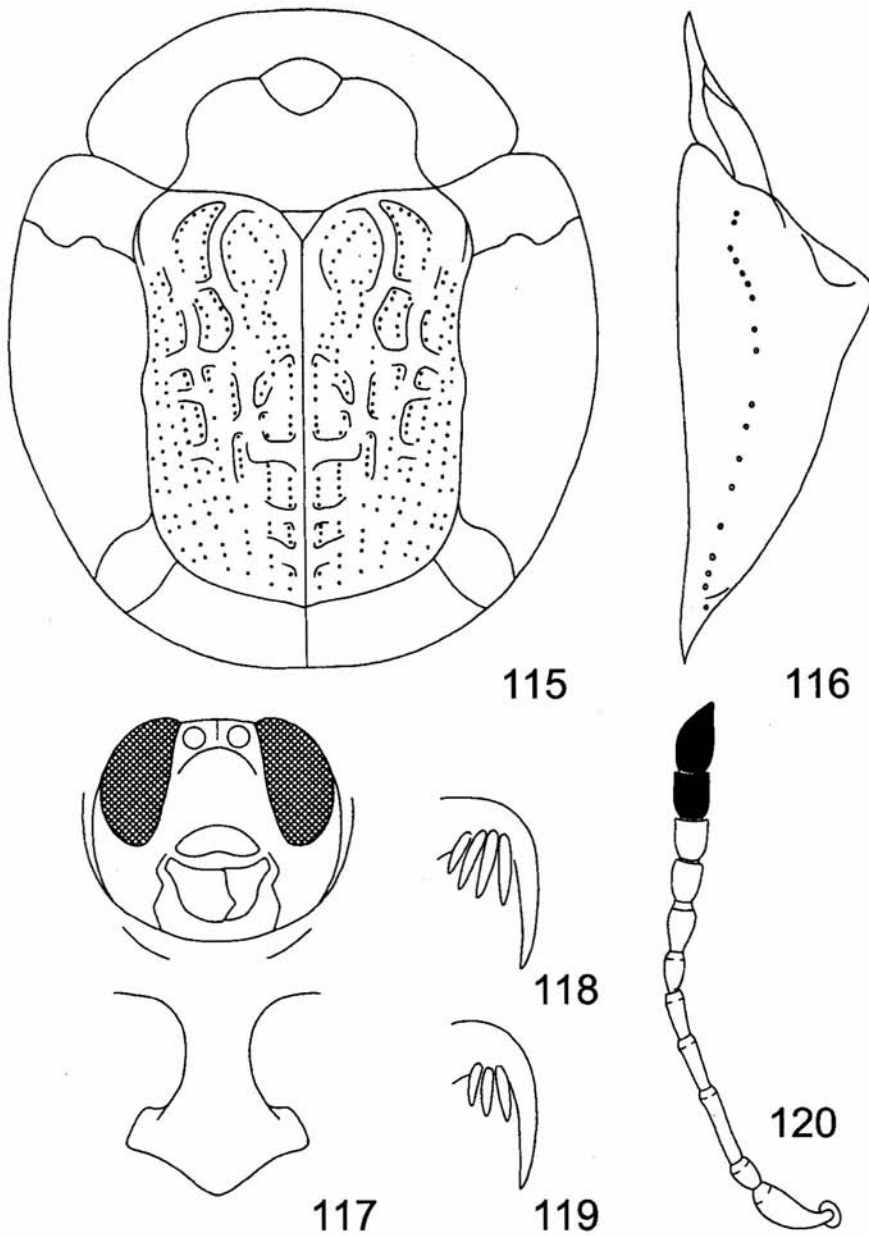
(figs 85-87, 115-120, 338, tab. 5: 6)

Aspidomorpha birmanica SPAETH, 1914 c: 544, 1914 e: 68; MAULIK, 1919: 330.

Aspidomorpha (*Aspidomorpha*) *birmanica*: BOROWIEC, 1999: 182.

DIAGNOSIS

A member of *A. sanctaerucis* group; differs from its relatives in slimmer, less rounded body sides, L/W usually above 1.15 (in the relatives below 1.14). Only *A. innuncta* have similar slim body, but differs in smaller size, with length below 11 mm (above 11 mm in *A. birmanica*), stout antennae, with third segment less than twice longer than second (in *A. birmanica* approximately 2.2 times longer), and surface of elytra less irregular than in *A. birmanica*. Ground colour of elytra is reddish-yellow in *A. birmanica*, and yellowish-green in *A. innuncta*. Both species are separated geographically, *A. birmanica* is known from Burma and Nepal, while *A. innuncta* only from southern India. Stout males of *A. birmanica* can be similar also to slim specimens of *A. lobata*, but *A. birmanica* differs in longer inner pecten of claws, extending to half length of claw, while in *A. lobata* it extends only to 1/3 length of claw.



115-120. *Aspidimorpha birmanica*: 115 - body in dorsal view, 116 - body in lateral view, 117 - head and prosternum, 118 - inner side of claw, 119 - outer side of claw, 120 - antenna

DESCRIPTION

L = 10.1-12.7; W = 9.2-10.2; Lp = 3.3-4.0; Wp = 7.0-7.8; L/W = (1.09)1.15-1.28; Wp/Lp = 1.85-2.30. Body short-oval (fig. 115), sexual dimorphism indistinct, males slightly stouter than females. Specimens from Nepal slightly stouter than specimens from Burma.

Pronotum, scutellum and disc of elytra yellowish-brown. Explanate margin of elytra with yellowish-brown humeral and posterolateral spots, extending to extreme margin of elytra, humeral spots hammer-shaped. Ventrites yellowish-brown, with black transverse spot on metathorax, and black spot in the middle of abdomen, which is sometimes reduced to indistinct spots at base of abdominal sternites. Legs yellow. Antennae mostly yellow, two last segments infusate to black.

Pronotum elliptical, approximately 1.92-2.30 times wider than long, with maximum width in 1/3 basal length, sides narrowly rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra moderately wider than base of pronotum. Humeral angles form an almost right but obtuse angle. Disc of elytra strongly convex, with very large, conical postscutellar tubercle (fig. 116), distinct principal and postscutellar impressions, and without lateral impressions. Postscutellar impressions bordered by a fold. Puncturation moderately coarse, distinct on whole length of disc, regular. In anterior part of second or fourth intervals additional, irregular punctures. Punctures in rows tend to be grouped by 3-6 together. Intervals mostly equal in width, approximately three times wider than punctures. Surface of elytra with numerous folds, appears irregular. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with long, sparse, erect hairs.

Clypeus approximately 1.5 times wider than long, shallowly impressed. Labrum broad, shallowly emarginate to 1/6-1/5 length. Mandibles with cutting edge, without teeth. Prosternal process rhomboidal, moderately wide, with shallow impression in the middle (fig. 117).

Length ratio of antennal segments: 100: 38: 94: 67: 56: 50: 50: 47: 47: 52: 85, segment 3 approximately 2.5 times longer than segment 2 and approximately 1.4 times than segment 4 (fig. 120).

Claws with distinct pecten on both sides. Inner pecten with four teeth, extending to 1/2-2/3 length of claw (fig. 118). Outer pecten with three, equal teeth extending to 2/5 length of claw (fig. 119).

Aedeagus slim, only slightly widened apically, apex broadly rounded, with barely marked apical process. Apical part softly curved ventrad. Ventral side with distinct, longitudinally striated membrane (figs 85-87).

TYPE MATERIAL

9 syntypes: "Minhla, Burmania, D. Comotte, 13" (5 MCSNG, 4 MM); syntype "Burmah" "Andrewes Request B.M. 1922-221" "*Aspidomorpha Burmanica* [sic] n.sp. cotype Spaeth det." (BMNH).

DISTRIBUTION

Burma; Nepal (fig. 338).

Aspidomorpha (s. str.) *castaneipennis* SPAETH, 1912

(figs 121-127, 153-154, tab. 6: 1, 2)

Aspidomorpha castaneipennis SPAETH, 1912: 117, 1914 c: 68, 1926 c: 118; BOROWIEC, 1990 a: 680; KIMOTO, 1998 a: 21 (incl. colour photo).*Aspidomorpha* (*Aspidomorpha*) *castaneipennis*: BOROWIEC, 1999: 182.*Aspidomorpha castaneipennis* var. *borneensis* SPAETH, 1912: 117, 1914 c: 68; BOROWIEC, 1999: 182 (as syn.).*Aspidomorpha borneensis*: SPAETH, 1926 c: 118.

DIAGNOSIS

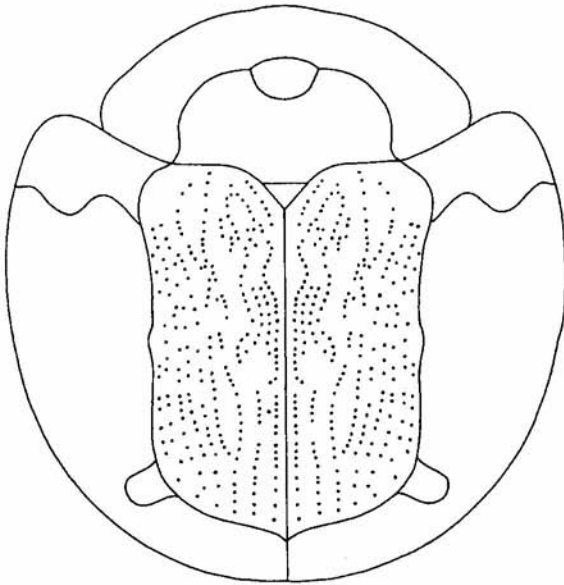
A member of *A. sanctaecrucis* group. *A. castaneipennis* and *A. ponderosa* form a subgroup which is characterized by very short inner pecten of claws extending only to 1/4 length of claw. Surface of elytra in both species is less sculptured than in remaining species, especially *A. castaneipennis* in posterior part of elytral disc it is completely smooth. Impressions of elytral disc in *A. castaneipennis* are much shallower than in *A. ponderosa*, postscutellar impressions practically without marginal fold or bordered by a barely marked elevation (in *A. ponderosa* postscutellar impressions are bordered by a distinct fold). *A. castaneipennis* is uniformly coloured, colour of spots of explanate margin is the same as colour of elytral disc, while in *A. ponderosa* spots of explanate margin are darker coloured than elytral disc, often with a dark spot on humeral calli. Both species occupy different areas: *A. castaneipennis* is distributed in western part of Sunda Is., Philippines, Malay Pen., and also recorded from Vietnam, while *A. ponderosa* is endemic to Moluccas. *A. intermedia* at first glance is also similar but differs in toothed mandibles, while in *A. castaneipennis*, as in other species of the *A. sanctaecrucis* group, mandibles have only cutting edges, without teeth.

DESCRIPTION

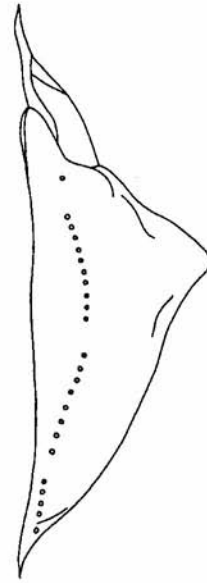
Male: L = 11.2-13.6; W = 11.4-13.6; Lp = 4.0-4.8; Wp = 7.5-9.1; L/W = 0.96-1.01; Wp/Lp = 1.86-2.00; Female: L = 12.5-12.7; W = 12.1-12.3; Lp = 4.1-4.4; Wp = 8.0; L/W = 1.01-1.05; Wp/Lp = 1.82-1.95. Body circular (fig. 121), sexual dimorphism indistinct, male usually smaller and stouter than female, but in populations from the Philippines males are as large as females.

Pronotum, scutellum and disc of elytra yellow, yellowish-brown to reddish brown. Explanate margin of elytra always with distinct, hammer-shaped humeral spots. Forms from Philippines also have posterolateral spots, extending to extreme margin of explanate margins, in forms from Sumatra the posterolateral spots are shortened, extending at most to half width of explanate margin, in forms from Borneo posterolateral spots are completely reduced. Ventrites yellow to yellowish-brown. Legs yellow. Antennae in populations from the Philippines, except Luzon, completely yellow, in forms from Borneo and from Luzon two last segments infusate, in forms from Sumatra last segment of antennae black, and penultimate segment infusate to black.

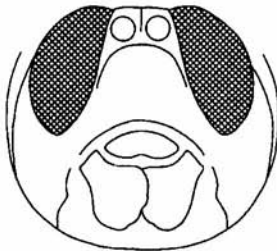
Pronotum elliptical, 1.82-2.00 times wider than long, with maximum width in 1/3 basal length, sides narrowly rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.



121



122



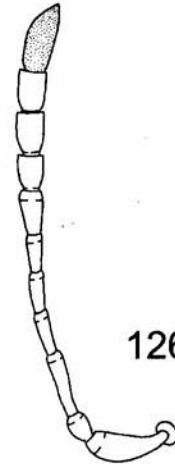
123



124



125

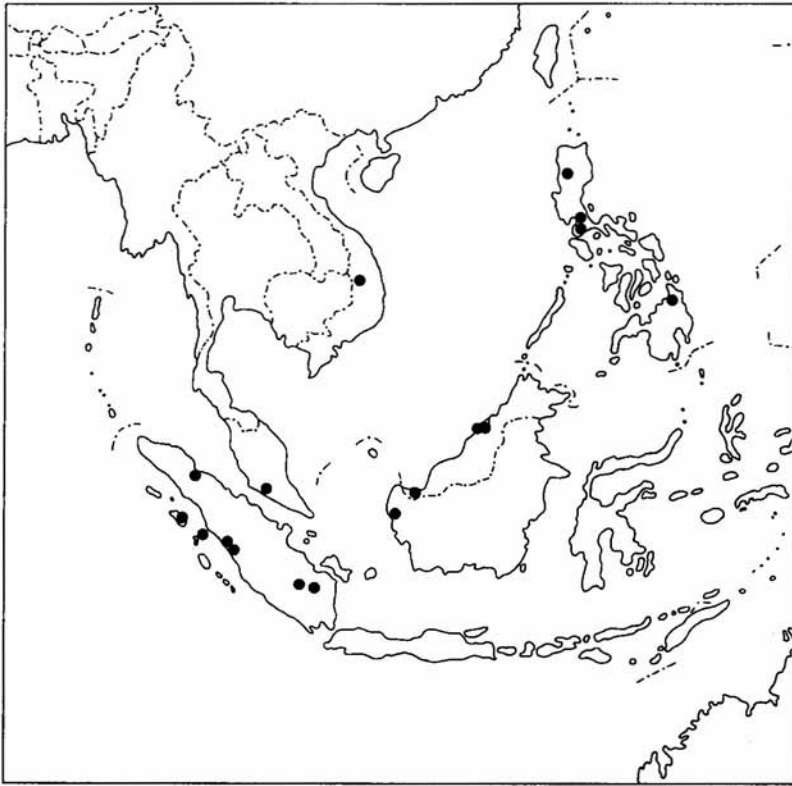


126

121-126. *Aspidimorpha castaneipennis*: 121 - body in dorsal view, 122 - body in lateral view, 123 - head and prosternum, 124 - inner side of claw, 125 - outer side of claw, 126 - antenna

Base of elytra distinctly wider than base of pronotum. Humeral angles form almost right but blunt angle. Disc of elytra strongly convex with very large, conical postscutellar tubercle (fig. 122), with shallow, not or indistinctly bordered by a fold, postscutellar impressions, distinct principal impressions, and shallow lateral impressions. Puncturation regular, moderately coarse, distinct on whole length of disc. Besides punctures arranged in rows, there are many additional, scattered punctures on second interval, especially in posterior part of postscutellar tubercle. Rarely additional punctures appear also on interval 4 close to principal impression. Intervals mostly equal in width, approximately three times wider than punctures. Sometimes second interval wider than remaining rows, approximately four times wider than punctures. Surface of intervals smooth. Disc only in anterior part appears slightly irregular. Elytra in most specimens glabrous, but in populations from Mindanao dull. Apex of elytral epipleura with erect hairs.

Clypeus 1.7 times wider than long, with impression in the middle. Labrum broad, in populations from Philippines emarginate only to 1/6 length, in remaining emarginate up to 1/4 length. Mandibles with cutting edge, without teeth. Prosternal process rhomboidal, broad, without impression (fig. 123).



127. Distribution of *Aspidimorpha castaneipennis*

Length ratio of antennal segments: 100: 38: 82: 56: 53: 50: 59: 41: 53: 50: 94, segment 3 approximately 2.2 times longer than segment 2 and approximately 1.5 times than segment 4 (fig. 126).

Claws with short pecten on both sides. Inner pecten with four, equal teeth, extending only to 1/6 length of claw (fig. 124). Outer pecten with three teeth, only slightly reaching beyond margin of claw (fig. 125).

Aedeagus slim, slightly widened apically, apex broadly rounded, with distinct apical process. Apical part distinctly curved ventrad. Ventral side without membrane (figs 153, 154).

TYPE MATERIAL

Aspidomorpha castaneipennis: syntype: "Solok Sumatra" "cotyp" (MM); syntype: "Padang Pandjang" "West Sumatra" "H. Rolle" "cotyp" (MM); syntype: "Sumatra" "cotyp" (MM); syntype: "Palembank Sumatra" "coll. Donckier" "Typus" (MM); 4 syntypes: "Nias" "cotyp" (MM).

Aspidomorpha castaneipennis ssp. *borneensis*: syntype "Pontianak, Borneo Holl., coll. Donckier" "Typ" (MM); syntype: "Wahnes Borneo" "cotyp" (MM); syntype: "Sar. [awak] coll. BALY" "cotyp" (MM).

DISTRIBUTION

Malaysia: Malacca, Borneo: Sarawak; Indonesia: Borneo, Nias, Sumatra; Philippines: Luzon, Mindanao; Vietnam: Nui Hon Cong (fig. 127).

REMARKS

There are three different geographic races. The typical form from Sumatra, Malacca, and Vietnam is the smallest, with well developed both humeral and posterolateral spots on marginalia, and shiny surface of elytra. The form from Borneo is similar to the typical form, but usually has only humeral spots on marginalia. The form from Philippines is the largest, with well developed both humeral and posterolateral spots on marginalia, but dull surface of elytra. But within each of the three geographical forms specimens with characters of other forms were observed, i.e., on Luzon island of the Philippines there is a form with reduced posterolateral spots on marginalia and shiny elytra, and on Sumatra specimens with dull elytra were found.

Aspidomorpha (s. str.) *chandrika* MAULIK, 1918

(figs 128-137, 140, 361, 362, tab. 9: 1, 2)

Aspidomorpha chandrika MAULIK, 1918 b: 322, 1919: 277 (incl. larva, fig.); GRESSITT, 1938 c: 577, 1952: 461; CHEN and ZIA, 1961: 441; GRESSITT and KIMOTO, 1963: 949; LIZHONG, 1982: 55; BASU, 1985: 213; CHEN et al., 1986: 580, 636.

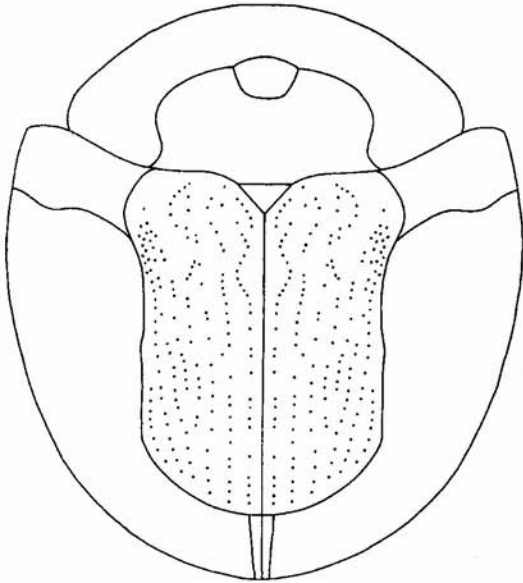
Aspidomorpha [sic!] *chandrika*: LIZHONG, 1989: 86.

Aspidomorpha (*Aspidomorpha*) *chandrika*: BOROWIEC, 1999: 182.

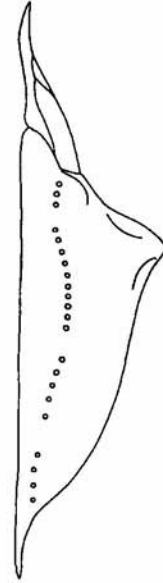
Aspidomorpha renidens SPAETH, 1926 c: 118; BOROWIEC, 1999: 182 (as syn.).

DIAGNOSIS

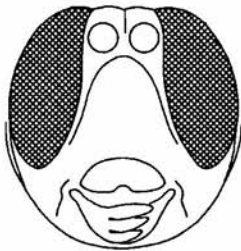
A member of *A. indica* group, but by its small size is similar also to members of the *A. furcata* group. *A. chandrika* distinctly differs from all species of both groups in presence of sutural spot on explanate margin of elytra.



128



129



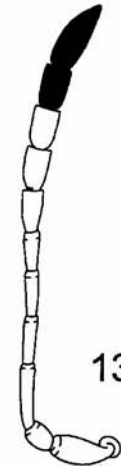
130



131



132



133

128-133. *Aspidimorpha chandrika*: 128 - body in dorsal view, 129 - body in lateral view, 130 - head and prothorax, 131 - inner side of claw, 132 - outer side of claw, 133 - antenna

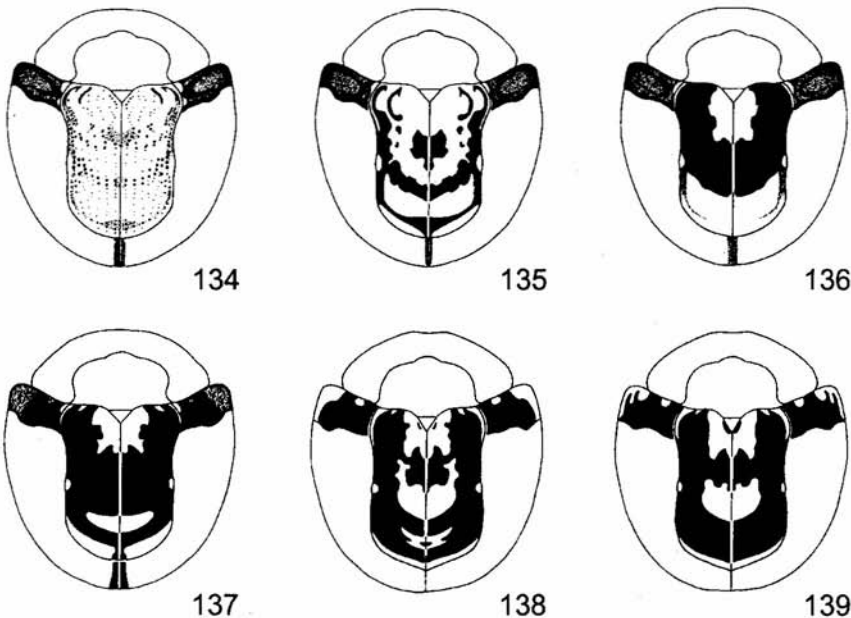
DESCRIPTION

$L = 6.6-7.7$; $W = 5.9-6.9$; $L_p = 2.3-2.7$; $W_p = 4.5-5.1$; $L/W = 1.07-1.18$; $W_p/L_p = 1.95-2.12$. Body circular (fig. 128), no sexual dimorphism.

Pronotum and scutellum yellow. Disc of elytra yellow, usually with yellowish-brown pattern composed with spot in postscutellar area and elongate spot along each side of disc, and two transverse bands: in $2/3$ length and in posterior part of disc (fig. 135). In the palest forms, the pattern of disc reduced to punctures marked with yellowish-brown (fig. 134). In the darkest forms, the pattern extends and covers almost whole surface of disc except for a yellow spot in postscutellar area, a yellow spot in $4/5$ length of disc, and a yellow apex of disc (fig. 137). Explanate margin of elytra with dark coloured humeral spots, and narrow sutural spot (figs 134-137). Humeral spots usually reach to extreme margin of elytra, often gradually paler from border of disc to extreme margin, occasionally do not extend to the extreme margin. Ventrites and legs yellow. Antennae mostly yellow, two last segments black.

Pronotum elliptical, 1.95-2.12 times wider than long, with maximum width in $2/5$ basal length, sides gently rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra distinctly wider than base of pronotum. Humeral angles slightly protruding anterad, right angled. Disc of elytra convex, with large conical postscutellar tubercle (fig. 129), with small and shallow principal impressions, and without postscutellar and lateral impressions. Puncturation regular, moder-



134-139. Variation of dorsal pattern: 134-137 - *Aspidimorpha chandrika*; 138, 139 - *Aspidimorpha biremis*

ately coarse, sparse on slope. Intervals mostly equal in width, approximately three to four times wider than punctures. Sometimes second interval slightly wider than remaining rows, five times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura pubescent.

Clypeus 1.7 times wider than long, with more or less marked impression in the middle. Labrum broad, emarginate to 1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 130).

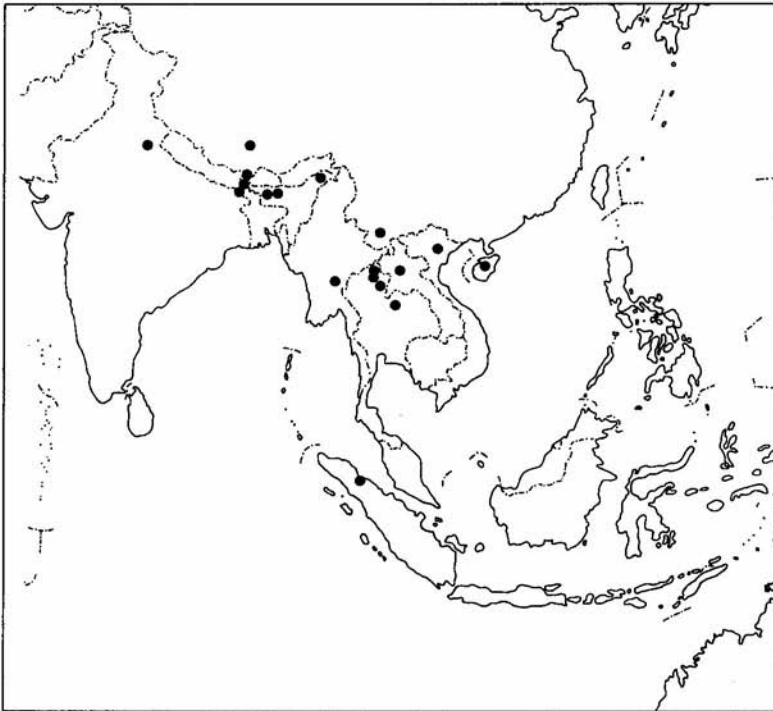
Length ratio of antennal segments: 100: 43: 100: 75: 71: 61: 68: 64: 64: 64: 114, segment 3 approximately 2.3 times longer than segment 2 and approximately 1.3 times than segment 4 (fig. 133).

Claws with distinct pecten on both sides. Inner pecten with three teeth, the longest tooth extending to 2/5 length of claw, next teeth gradually shorter (fig. 131). Outer pecten with two teeth, extending to 1/3 length of claw, second slightly shorter than first (fig. 132).

Aedeagus of *A. indica* type (fig. 361-362).

HOST PLANT

Convolvulaceae: Ipomoea sp. (GRESSITT 1952).



140. Distribution of *Aspidimorpha chandrika*

TYPE MATERIAL

Aspidomorpha chandrika: syntype: "Darjeeling distr. Ghumti, 4000 ft July 1912" "Cotype" (BMNH).

Aspidomorpha renidens: holotype: "Doli Dololu Baros, 1000 m, Sumatra" "renidens typ unic. SPAETH det." (MM).

DISTRIBUTION

Burma; China: Hainan, Yunnan; India: Arunchal Pradesh, Darjeeling, Meghalaya, Uttar Pradesh, West Bengal; Indonesia: Sumatra; Laos; Thailand; Vietnam: Hanoi (fig. 140).

***Aspidomorpha (s. str.) deusta* (FABRICIUS, 1775)**

(figs 141-152, 155, 156, 172, tab. 3: 7-9)

Cassida deusta FABRICIUS, 1775: 89, 1781: 109, 1787: 63, 1792: 297, 1801: 396; GOEZE, 1777: 211; OLIVIER, 1790: 382, 1808: 954 (incl. fig.); HERBST, 1799: 334; SCHOENHERR, 1817: 218; BOISDUVAL, 1835: 543; BOHEMAN, 1854: 333, 1856: 118, 1862: 289; ZIMSEN, 1964: 90.

Aspidomorpha deusta: GEMMINGER and HAROLD, 1876: 3648; MASTERS, 1887: 86; SPAETH, 1903 a: 137, 1914 e: 70, 1915: 235; MJOBERG, 1917: 16; HAWKESWOOD, 1988: 107; BOROWIEC, 1990 a: 680; MEDVEDEV, 1995: 20; KIMOTO et al., 1995: 103 (incl. photo); REID, 1998: 303; KIMOTO, 1998 b: 62; NORAMLY, 2000: 243-246 (incl. photo); MOHAMEDSAID, 2000 a: 358, 2000 b: 375.

Aspidomorpha (Aspidomorpha) deusta: BOROWIEC, 1992: 142 (incl. fig.), 1999: 183.

Aspidomorpha deusta: BOROWIEC, 1996: 7.

Cassida collina BOISDUVAL, 1835: 541; BOHEMAN, 1854: 333 (as syn. of *deusta*).

Aspidomorpha corallina [sic]: GEMMINGER and HAROLD, 1876: 3648 (in syn. of *deusta*); MASTERS, 1887: 86.

Cassida angulifera BLANCHARD, 1853: 324; BOHEMAN, 1854: 333 (as syn. of *deusta*).

Cassida nigrodorsata BOHEMAN, 1856: 119, 1862: 293; BOROWIEC, 1992: 142 (as syn. of *deusta*).

Aspidomorpha nigrodorsata: GEMMINGER and HAROLD, 1876: 3650; MASTERS, 1887: 86.

Aspidomorpha deusta ssp. *nigrodorsata*: SPAETH, 1914 e: 71.

Sindia schawalleri MEDVEDEV in MEDVEDEV and ZAITSEV, 1993: 41; BOROWIEC, 1994 b: 154 (as syn. of *deusta*); MEDVEDEV, 1995: 20 (as syn. of *deusta*).

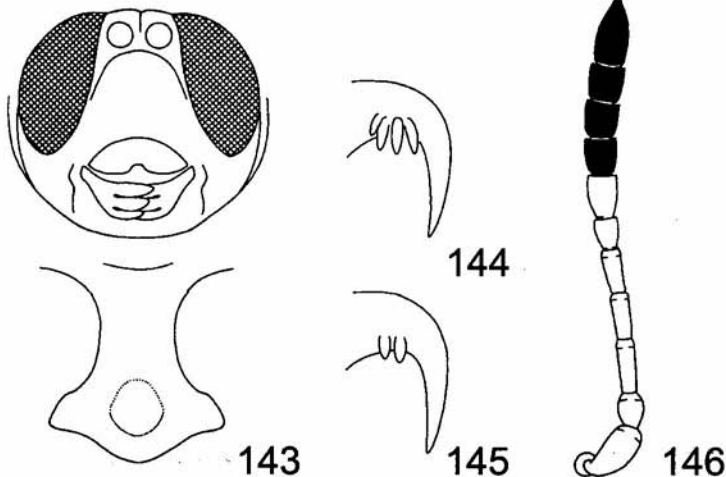
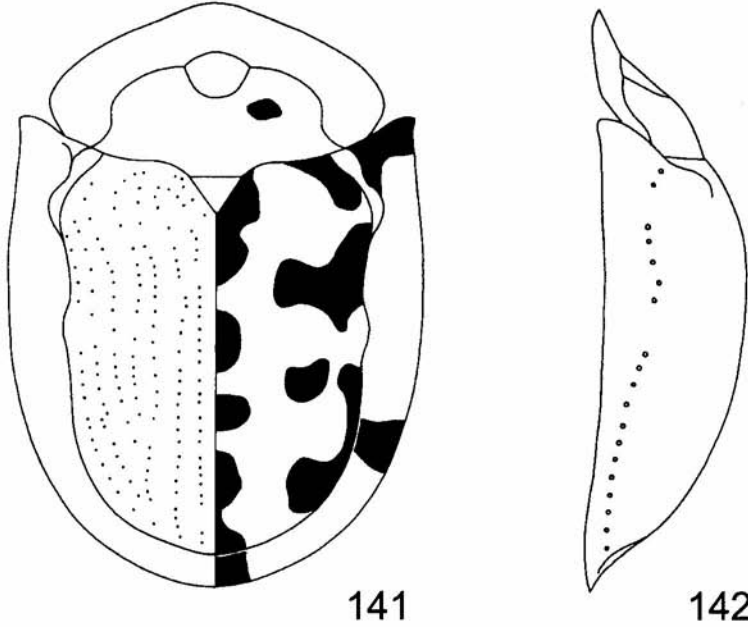
DIAGNOSIS

A very distinctive species, close only to *A. angoramensis* BOR. from New Guinea. Differs from all Oriental species in depressed elytral disc, acute humeral angles, pronotum with two circular spots, elongate, almost parallel-sided body, and a short third antennal segment. Only *A. orientalis* is similar in colour and body shape, but differs in a semicircular, uniformly yellow pronotum and obtuse humeral angles.

DESCRIPTION

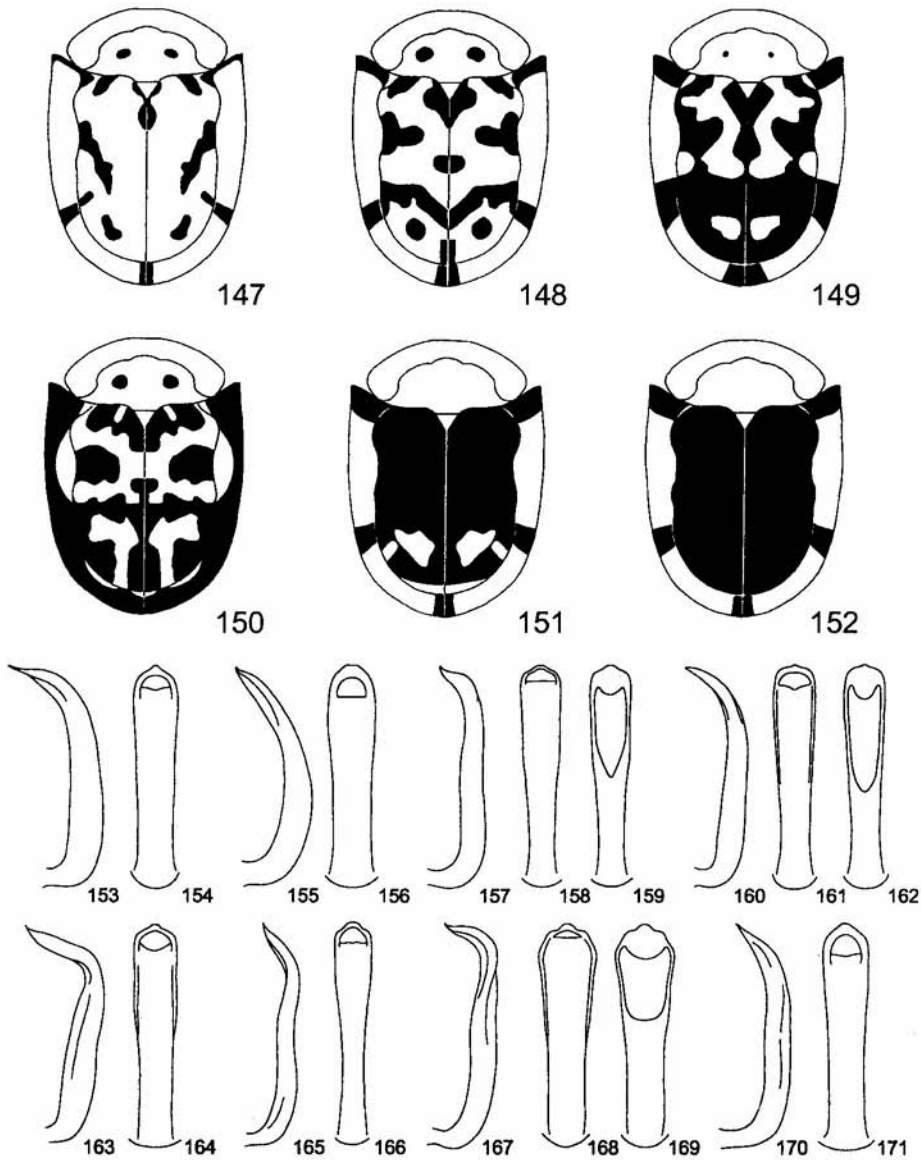
Male: L = 7.6-8.4; W = 5.5-6.3; Lp = 2.2-2.5; Wp = 4.2-4.9; L/W = 1.33-1.40; Wp/Lp = 1.90-2.13; Female: L = 9.0-9.9; W = 6.4-7.3; Lp = 2.3-2.8; Wp = 5.2-5.7; L/W = 1.35-1.42; Wp/Lp = 2.03-2.26. Body oval, almost parallel-sided (fig. 141), sexual dimorphism slightly marked, male always smaller than female.

Pronotum yellow with two black spots, occasionally in forms from the Papuan Subregion pronotum immaculate (figs 151, 152). Scutellum yellow. Disc of elytra yellow, with a constant pattern composed of either black spots (figs 147, 148) and punctures marked with black or transverse bands and elongate spots (figs 149, 150). Occasionally disc of elytra completely black or black with yellow transverse



141-146. *Aspidimorpha deusta*: 141 - body in dorsal view, 142 - body in lateral view, 143 - head and prosternum, 144 - inner side of claw, 145 - outer side of claw, 146 - antenna

band and yellow windows in posterior part of disc (figs 151,152). Explanate margin of elytra usually with humeral, posterolateral, and sutural spots. Humeral spots always extending to anterior margin of marginalia. Occasionally explanate margin black with two yellow windows on each side (fig. 150). Ventrites and legs



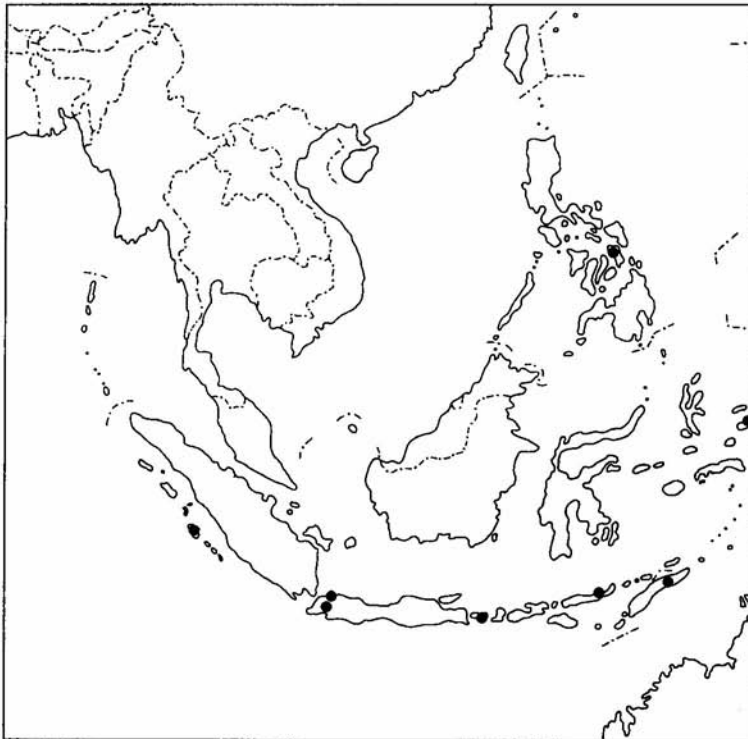
147-152. *Aspidimorpha deusta*: variation of dorsal pattern; 153-171. Aedeagi: 153, 154 - *Aspidimorpha castaneipennis*; 155, 156 - *A. deusta*; 157-159 - *A. dulcicula*; 160-162 - *A. elevata*; 163, 164 - *A. difformis*; 165, 166 - *A. dorsata*; 167-169 - *A. furcata*; 170, 171 - *A. fusconotata*; 153, 155, 157, 160, 163, 165, 167, 170 - lateral; 154, 156, 158, 161, 164, 166, 168, 171 - dorsal; 159, 162, 169 - ventral

yellow. Seven basal segments of antennae yellow, remaining segments black, sometimes 7th segment infuscate.

Pronotum ellyptical, 1.90-2.26 times wider than long, with maximum width in 2/5 basal length, sides narrowly rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra distinctly wider than pronotum. Humeral angles acute, slightly protruding anterad, extreme margin of explanate margin of elytra behind humeral angles usually shallowly emarginate. Disc of elytra regularly convex, on the top slightly depressed, without postscutellar tubercle (fig. 142), with distinct principal and shallow postscutellar impressions. Puncturation regular, moderately coarse, distinct on whole length of disc. Intervals mostly equal in width, approximately four times wider than punctures, sometimes interval 3 slightly wider than remainder, approximately five times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura bare.

Clypeus 1.6 times wider than long, slightly convex, without impression. Labrum broad, distinctly emarginate to 1/4-1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression or in middle with shallow circular impression (fig. 143).



172. Distribution of *Aspidimorpha deusta*

Length ratio of antennal segments: 100: 50: 82: 71: 68: 46: 68: 53: 53: 57: 107, segment 3 approximately 1.6 times longer than segment 2 and approximately 1.2 times than segment 4 (fig. 146).

Claws with pecten on both sides. Inner pecten with four teeth extending to 1/4-1/3 length of claw (fig. 144). Outer pecten with two teeth extending to 1/5-1/4 length of claw (fig. 145).

Aedeagus slim, slightly widened apically, apical part broadly rounded, gently curved ventrad, apex truncate. Ventral side without membrane (figs 155, 156).

HOST PLANT

Convolvulacea: Ipomoea pes-caprae (HAWKESWOOD 1988); *Ipomoea* sp. (MEDVEDEV et ZAITSEV 1993).

TYPE MATERIAL

Cassida deusta: syntype: "Nova Hollandia" "396.44" (ZMK).

Cassida collina: type lost.

Cassida angulifera: type lost.

Cassida nigrodorsata: lectotype: "Nov. Holl." "Brit. Mus." "Type" (NRS) – designated by BOROWIEC (1999); paralectotype: "Port Essington" "*Cassida nigrodorsata*" "Type" (BMNH).

Sindia schawalleri: 2 paratypes: "Philippines, Leyte, Visayas State College of Agriculture N Baybay, cultivated land, 1.III.1991, leg. W. Schawaller, J. Trautner & K. Geigenmüller" (SMNS).

DISTRIBUTION

Australia: N New South Wales, Queensland, Northern Territory; Indonesia: Bali, Flores, Java, Sulawesi, Sumatra, West Irian; Papua New Guinea; Philippines: Leyte; Timor (fig. 172).

Aspidimorpha (s. str.) *difformis* (MOTSCHULSKY, 1860)

(figs 163, 164, 173-178, 278, 588, 589, tab. 13: 1, 2)

Deloyala difformis MOTSCHULSKY, 1860: 27; KIMOTO, 1978: 73 (as syn. of *indica*); WĘGRZYNOWICZ and WAŚOWSKA, 1996: 45.

Aspidimorpha difformis: BOHEMAN, 1862: 277; BALY, 1874: 211; GEMMINGER and HAROLD, 1876: 3648; KRAATZ, 1879: 270; GORHAM, 1885: 280; WEISE, 1900: 295; SPAETH, 1914 d: 129, 1914 e: 67; SPAETH and REITTER, 1926: 10; CHŪJŌ, 1934: 152, 1951: 46; GRESSITT, 1939: 139, 1952: 462; MEDVEDEV, 1957: 554; GRESSITT and KIMOTO, 1963: 949; KIMOTO, 1966: 644; MEDVEDEV and ZAITSEV, 1978: 171 (larva); YU, 1986: 681; CHEN et al., 1986: 580, 636 (incl. male gen.); LIZHONG, 1989: 86; AN et al., 1985: 12; MEDVEDEV, 1992: 598; KIMOTO and CHU, 1996: 134 (in syn. of *furcata*); KIMOTO et al., 1995: 104 (in syn. of *furcata*).

Aspidimorpha difformis: BOROWIEC, 1996: 7.

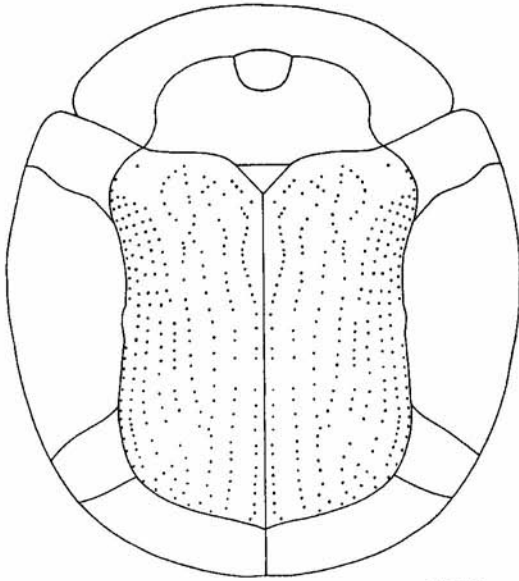
Aspidimorpha (Aspidimorpha) difformis: BOROWIEC, 1999: 183.

Aspidimorpha difformis ab. *japonica* SPAETH in SPAETH and REITTER, 1926: 10; SPAETH, 1942 a: 12; CHŪJŌ, 1934: 153.

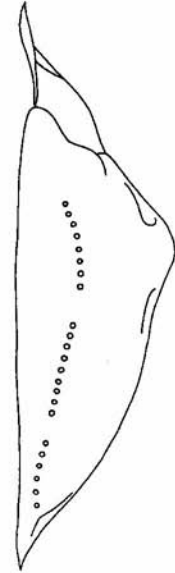
Aspidimorpha indica: BOROWIEC, 1985: 26 (part, specimens from USSR and Korea).

DIAGNOSIS

A member of *A. indica* group, but its small size is similar also to members of the *A. furcata* group. Differs from species of both group, except *A. assimilis* and *A. snizeki*, in very low and obtuse postscutellar tubercle. *A. assimilis* is much



173



174



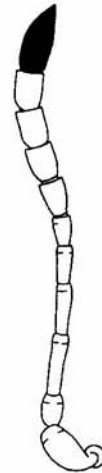
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178

173-178. *Aspidimorpha difformis*: 173 - body in dorsal view, 174 - body in lateral view, 175 - head and prosternum, 176 - inner side of claw, 177 - outer side of claw, 178 - antenna

stouter than *A. difformis*, with L/W below 1.16, while in *A. difformis* L/W is above 1.18. Explanate margin of *A. difformis* always has both spots, while specimens *A. assimilis* are frequently without spots on explanate margin or with only humeral spots. Both species are separated geographically, *A. difformis* is found in eastern Palaearctic south to Taiwan, while *A. assimilis* occurs on Sunda Is., Malay Pen., and Thailand. *A. snizeki* is very similar, but differs in denser elytral puncturation, slightly shorter pecten of claws, and aedeagus of "indica" type, gently curved ventrad. The second eastern Palaearctic species, *A. transparipennis*, distinctly differs in depressed elytral disc, without postscutellar tubercle. *A. difformis* has unique male genitalia, with apical third of aedeagus strongly curved ventrad, while in members of *A. indica* groups it is gently curved ventrad, in members of the *A. furcata* aedeagus is spoon-like, with only apex curved ventrad.

DESCRIPTION

L = 6.6-8.6; W = 4.9-6.9; Lp = 1.9-2.6; Wp = 3.7-5.1; L/W = 1.16-1.28; Wp/Lp = 1.77-2.45. Body shortly-oval (fig. 173), sexual dimorphism indistinct.

Pronotum yellow. Scutellum yellow to yellowish-brown. Disc of elytra usually yellow with punctures marked with yellowish-brown to dark-brown areola. Larger and deeper coloured areolae on each side of disc can expand to form an elongate spot, extending from base of humeral callus to 2/3 length of disc (fig. 588). Strongly marked areolae on the top of postscutellar tubercle, and sometimes areolae in 1/3 length of disc, can form a more or less distinct V-shaped band. Explanate margin of elytra with reddish-brown to brown humeral and posterolateral spots (figs 588, 589). Humeral spots usually darker in the middle and along borders and usually paler at the base. Posterolateral spots usually darker along borders. In the rare darkest forms, disc of elytra dark-brown, with small Y-shaped yellow spot along scutellum and anterior part of suture, and explanate margin with dark-brown humeral and posterolateral spots (figs 589). Ventrites and legs yellow. Antennae yellow, last segment infusate to black. Apical part of penultimate segment sometimes infusate.

Pronotum elliptical, 1.77-2.45 times wider than long, with maximum width in basal 1/3 length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra wider than base of pronotum. Humeral angles slightly protruding anterad, subangulate to subacuminate. Disc of elytra convex with low, obtuse and conical postscutellar tubercle (fig. 174), shallow principal and extremely shallow (sometimes barely marked) lateral impressions. In populations from the northern range postscutellar tubercle lower and more obtuse than in southern populations. Puncturation regular, moderately coarse, distinct on whole length of disc. Intervals mostly equal in width, approximately three to four times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with sparse hairs.

Clypeus 1.5 times wider than long, in apical half with a more or less distinct impression. Labrum broad, emarginate to 1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide (fig. 175).

Length ratio of antennal segments: 100: 46: 96: 78: 53: 46: 53: 53: 57: 57: 114, segment 3 approximately 2.1 times longer than segment 2 and approximately 1.2 times than segment 4 (fig. 178).

Claws with distinct pecten on both sides. Inner pecten with four teeth extending to 2/5 length of claw (fig. 176), outer pecten with two teeth extending to 1/4 length of claw (fig. 177).

Aedeagus slim, moderately widened apically, apex broadly rounded, with small and obtuse apical process. Apical part strongly curved ventrad, up to 90°. Ventral side without membrane (figs 163, 164).

HOST PLANT

Convolvulaceae: *Calystegia sepium* var. *japonica* (GRESSITT 1952); *Calystegia japonica* (CHŪJŌ et KIMOTO 1961).

TYPE MATERIAL

Aspidomorpha difformis: syntype: "Japan" "Motsch" "Type" (NRS); 2 syntypes: "Japan" (IZPAN).

Aspidomorpha difformis ab. *japonica*: syntype: "Japan" (MM).

DISTRIBUTION

China: Fujian, Guizhou, Hebei, Manchuria, Sichuan, Zhejiang; Taiwan; Japan: Awashima, Hokkaido, Honshu, Kyushu, Okinawa, Shikoku; Korea; Russia: the Far East (fig. 278).

REMARKS

KIMOTO (1987) treated *A. difformis* as a synonym of *A. indica*; KIMOTO et al. (1995) synonymized both names with *A. furcata*. It is a mistake, because *A. difformis* and *A. indica* belong to a different species group than *A. furcata*. The error occurred probably because of misinterpretation of infraspecific variation in all forms. In all previous papers *A. furcata* has been characterized as a species with only humeral spots on marginalia, and the remaining two species as possessing both humeral and posterolaterals spots. KIMOTO found specimens of *A. furcata* with a complete set of spots and thus suggested that *A. indica* and *A. difformis* are only local variations of *A. furcata*. In fact, *A. furcata* shows aberrations with only humeral, or with both humeral and posterolateral spots on marginalia, while *A. indica* and *A. difformis* show only aberrations with both spots. These three species distinctly differ in male genitalia, *A. furcata* has a spoon-like aedeagus, while the aedeagus of *A. indica* and *A. difformis* is slim, not spoon-like. In *A. difformis*, the apical third of aedeagus is strongly curved (approximately 90°), while in *A. indica* only gently bent ventrad. These differences were discussed by CHEN et al. (1986) but probably overlooked by KIMOTO. *A. difformis* is also separated geographically, it is distributed mostly in East Palaearctic, and only on Taiwan and in Guizhou Province of China it is sympatric with mostly Oriental *A. furcata* and *A. indica*.

Aspidomorpha (s. str.) dorsata (FABRICIUS, 1787)

(figs 179-189, 165, 166, tab. 9: 5, 6)

Cassida dorsata FABRICIUS, 1787: 64, 1792: 301, 1801: 401; HERBST, 1799: 342; SCHÖNHERR, 1817: 223; ZIMSEN, 1964: 91.

Aspidomorpha dorsata: BOHEMAN, 1854: 296, 1856: 112, 1862: 270; BALY, 1863: 13; GEMMINGER and HAROLD, 1876: 3648; DUVIVIER, 1891: 50; WEISE, 1897: 103, 1901: 52; SPAETH, 1914 e: 68, 1926 c: 118; MAULIK, 1919: 275 (larva), 332; GRESSITT, 1938 a: 188, 1938 c: 578, 1939: 139, 1952: 463 (incl. fig.); CHEN and ZIA, 1961: 441; GRESSITT and KIMOTO, 1963: 950 (incl. fig.); KIMOTO, 1981: 58, 1998: 22 (incl. colour photo); MEDVEDEV and DAN, 1982: 95; LIZHONG, 1982: 54, 1989: 86; ZAITSEV and MEDVEDEV, 1983: 141 (larva); YU, 1983: 795, 1986: 681; BOROWIEC, 1985: 28, 1990 a: 681; CHEN et al., 1986: 581, 636, pl. XIV (incl. colour fig.); BOROWIEC and TAKIZAWA, 1991: 637; MEDVEDEV and EROSHKINA, 1988: 125; ZAITSEV, 1992: 179 (pupa); KIMOTO et al., 1995: 104 (incl. photo); REID, 1998: 303; MOHAMEDSAID, 2000 b: 375; MEDVEDEV, 1997: 265; MEDVEDEV and SPRECHER-UEBERSAX, 1999: 347.

Aspidomorpha dorsata: BOROWIEC, 1996: 7.

Aspidomorpha (Aspidomorpha) dorsata: BOROWIEC, 1999: 184.

Aspidomorpha calligera BOHEMAN, 1854: 297, 1856: 112, 1862: 270; GEMMINGER and HAROLD, 1876: 3648; WEISE, 1897: 104 (as syn.).

DIAGNOSIS

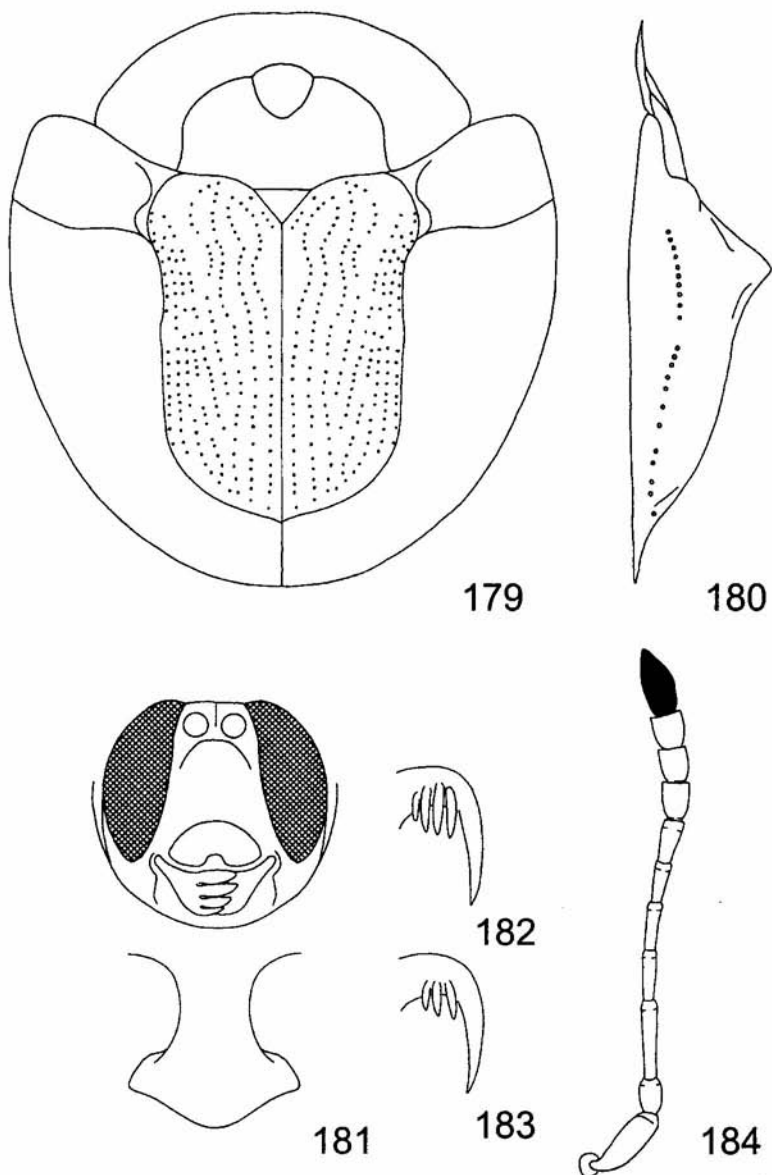
A member of *A. dorsata* group. *A. dorsata* is the largest species of the group, always with distinct humeral and without posterolateral spots on elytral marginalia, and with long inner pecten of claws extending at least to 2/5 length of claw. Only the largest specimens of *A. fuscopunctata* with distinct humeral spots on explanate margin of elytra are similar to *A. dorsata*, but such specimens of *A. fuscopunctata* are very rare, and humeral spots of this species are usually reduced or extending at most to half width of explanate margin; usually the spot is of the same colour as elytral disc, while in *A. dorsata* humeral spots are usually darker than the ground colour of elytra. *A. dorsata* commonly shows dark spots on elytral disc, while in *A. fuscopunctata* disc is immaculate and only punctures are marked with dark areolae. Mean body size of *A. dorsata* is distinctly larger than in *A. fuscopunctata*, most specimens of *A. dorsata* have body length above 10 mm, while in *A. fuscopunctata* specimens reaching 10 mm are very rare, and usually their length is between 9.0 to 9.5 mm. Other species of the group with only humeral spots distinctly differ from *A. dorsata* in very short pecten of claws, extending at most to 1/3 length of claw.

DESCRIPTION

Male: L = 9.8-11.2; W = 9.3-10.3; Lp = 3.3-3.7; Wp = 6.3-7.3; L/W = 1.04-1.09; Wp/Lp = 1.88-2.09. Female: L = 9.5-12.6; W = 8.7-11.3; Lp = 3.0-3.9; Wp = 6.0-7.6; L/W = 1.07-1.13; Wp/Lp = 1.87-2.03. Body broad, slightly trapezoidal to subcircular (fig. 179). Sexual dimorphism barely marked, males slightly smaller and stouter than females.

Pronotum and scutellum yellow. In the rare, palest forms disc of elytra yellow with punctures marked with yellowish-brown areola (fig. 185). In dark forms, punctures marked with yellowish-brown areola, and disc with yellowish-brown

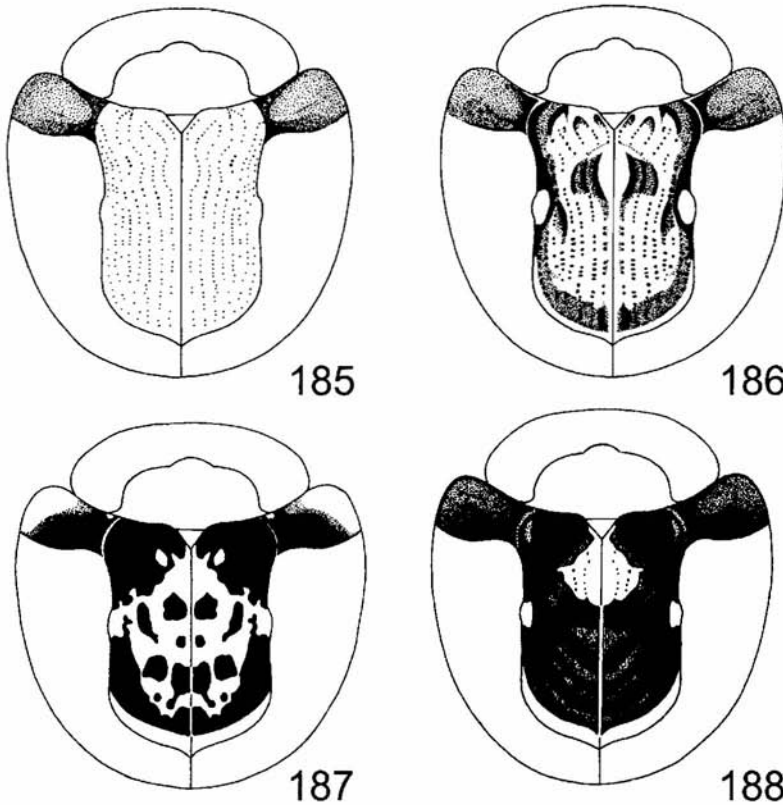
spot around postscutellar tubercle and elongate spot along each side of disc, often coalescent in posterior part of disc. Disc of elytra often yellowish-brown to brown with yellow spot on postscutellar tubercle, small yellow spot on each side in half length of disc, and yellow transverse band in posterior part of disc (fig. 186).



179-184. *Aspidimorpha dorsata*: 179 - body in dorsal view, 180 - body in lateral view, 181 - head and prothorax, 182 - inner side of claw, 183 - outer side of claw, 184 - antenna

Explanate margin of elytra usually with yellowish-brown to brown, darker at base and gradually paler externally humeral spots, extending to anterior and lateral margin of elytra (figs 185-188). Rarely disc with two spots in 1/2 and 2/3 length, black spot on humeral callus, between scutellum and border of disc, black transverse band in posterior part of disc, which never extends to posterior border of disc, and punctures marked with dark areolae of various size. Explanate margin of such forms with black humeral spots extending only to 2/3 width of explanate margin (fig. 187). In exceptional cases almost whole disc dark-brown to black, with yellow spot in postscutellar area (fig. 188), but explanate margin never with posterolateral spots. Ventrites and legs yellow. Antennae yellow, usually last segment black and penultimate segment infuscate, rarely 10th segment black.

Pronotum elliptical, 1.87-2.09 times wider than long, with maximum width in 2/5 basal length, sides regularly rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.



185-188. *Aspidimorpha dorsata*: variation of dorsal pattern

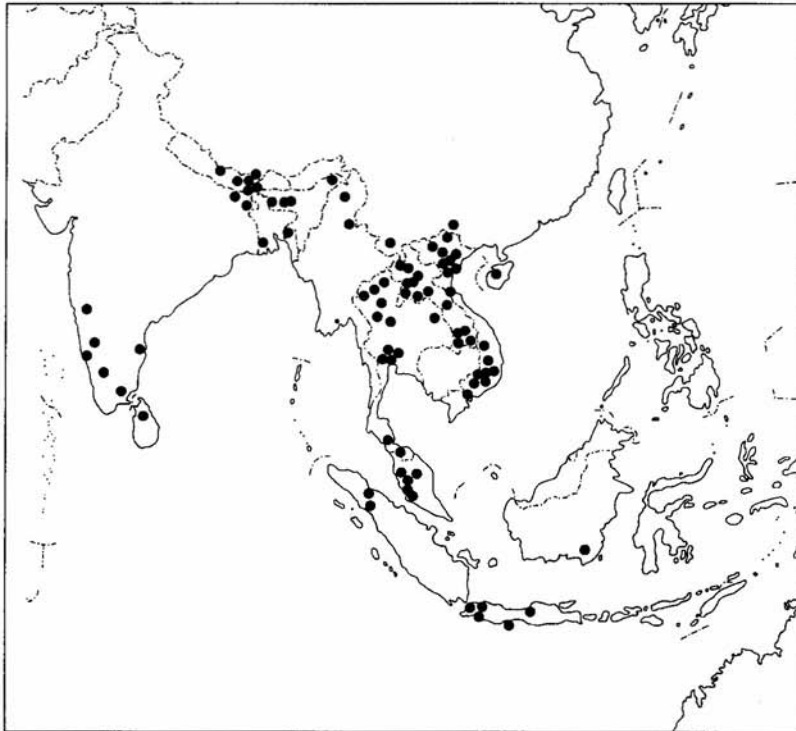
Base of elytra distinctly wider than base of pronotum. Humeral angles slightly protruding anterad, rounded. Disc convex, with large, conical postscutellar tubercle (fig. 180), barely marked principal impressions, without postscutellar and lateral impressions. Puncturation moderately coarse, distinct on whole length of disc, regular. Intervals equal in width, approximately five times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with sparse hairs.

Clypeus 1.3 times wider than long, slightly convex. Labrum broad, emarginate to 1/4 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 181).

Length ratio of antennal segments: 100: 40: 97: 62: 59: 48: 54: 43: 43: 86, segment 3 approximately 2.4 times longer than segment 2 and approximately 1.6 times longer than segment 4 (fig. 184).

Claws with distinct pecten on both sides. Inner pecten with four teeth extending to 2/5 length of claw (fig. 182), outer pecten with three teeth extending to 1/3 length of claw (fig. 183).

Aedeagus very slim, slightly widened apically, slightly S-shaped in profile, apex broadly rounded with broad and obtuse apical process. Apical part gently curved ventrad. Ventral side without membrane (figs 165-166).



189. Distribution of *Aspidimorpha dorsata*

HOST PLANT

Convolvulaceae: Ipomoea sp. (GRESSITT 1952, MEDVEDEV et DAN 1982)).

TYPE MATERIAL

Cassida dorsata: holotype: "Siam" "Type" (BMNH).

Aspidomorpha calligera: lectotype and paralectotype: "Bengalia" "Westerm." "Type" (NRS) – designated by BOROWIEC (1999).

DISTRIBUTION

Burma; Cambodja; Ceylon; China: Guangxi, Hainan, Yunnan; India; Indonesia: Borneo, Celebes, Java, Sumatra; Laos; Malaysia; Thailand; Vietnam (fig. 189).

***Aspidomorpha* (s. str.) *dulcicula* BOHEMAN, 1862**

(figs 157-159, 190-196, tab. 9: 7)

Aspidomorpha dulcicula BOHEMAN, 1862: 278; GEMMINGER and HAROLD, 1876: 3649; SPAETH, 1912 d: 117, 1914 e: 68, 1926 c: 118; MAULIK, 1916: 586; BOROWIEC, 1990 a: 681; MOHAMEDSAID, 1993: 46 (incl. colour photo), 2000 a: 358.

Aspidomorpha dulcidula [sic!]: MOHAMEDSAID, 1994: 370.

Aspidomorpha dulcicula: BOROWIEC, 1996: 8.

Aspidomorpha (Aspidomorpha) dulcicula: BOROWIEC, 1999: 184.

DIAGNOSIS

A member of *A. indica* group. *A. dulcicula* is distinctly larger than most species of the group. *A. dulcicula* is well distinguished by short inner pecten of claws extending at most to 1/3 length of claw, and by characteristic, constant pattern on elytral disc, which forms dark spot behind postscutellar tubercle on reddish ground colour and spot in humeral area which extends distinctly behind humeral callus. Large specimens of *A. biremis* are similar to *A. dulcicula* but their pattern of elytral disc is different – there are pale spots in postscutellar area and behind middle on brown ground colour.

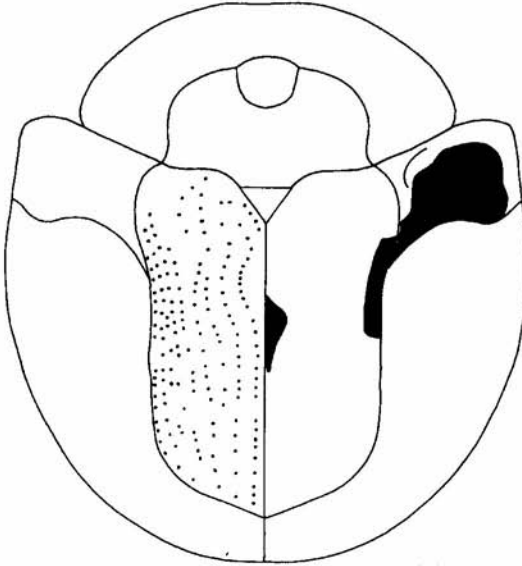
DESCRIPTION

L = 8.1-8.6; W = 7.4-8.1; Lp = 2.6-3.0; Wp = 5.2-5.7; L/W = 1.06-1.15; Wp/Lp = 1.89-2.11. Body circular (fig. 190), sexual dimorphism barely marked.

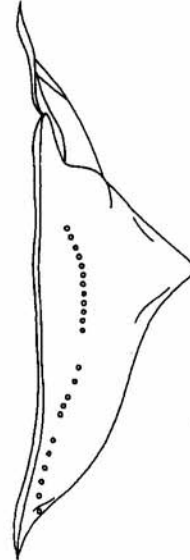
Pronotum yellow to reddish-brown. Scutellum yellow, sometimes reddish-brown. Disc of elytra usually reddish-brown, rarely yellow to yellowish-orange, with brownish-black or black spot behind tubercle, occupying first and partly second intervals, extending from 1/3 to 2/3 length of disc and with elongate spot along intervals 8-9 extending from base of humeral callus to 1/3 length of disc. Punctures often marked with yellowish-brown, especially on sides of disc. Explanate margin of elytra with brownish-black or black humeral spots, margined by yellow. In the palest forms, humeral spots occasionally almost dark yellow, except for infuscate base; humeral spots usually connected with elongate spots on sides of disc (fig. 190). Ventrites and legs yellow. Antennae yellow, two last segments black.

Pronotum elliptical, 1.89-2.11 times wider than long, with maximum width in basal 1/3 length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

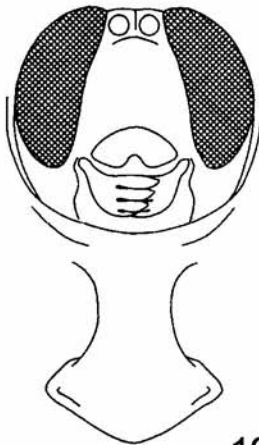
Base of elytra wider than base of pronotum. Humeral angles protruding anterad, right angled. Disc of elytra convex, with large conical postscutellar



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190-195. *Aspidimorpha dulcicula*: 190 - body in dorsal view, 191 - body in lateral view, 192 - head and prosternum, 193 - inner side of claw, 194 - outer side of claw, 195 - antenna

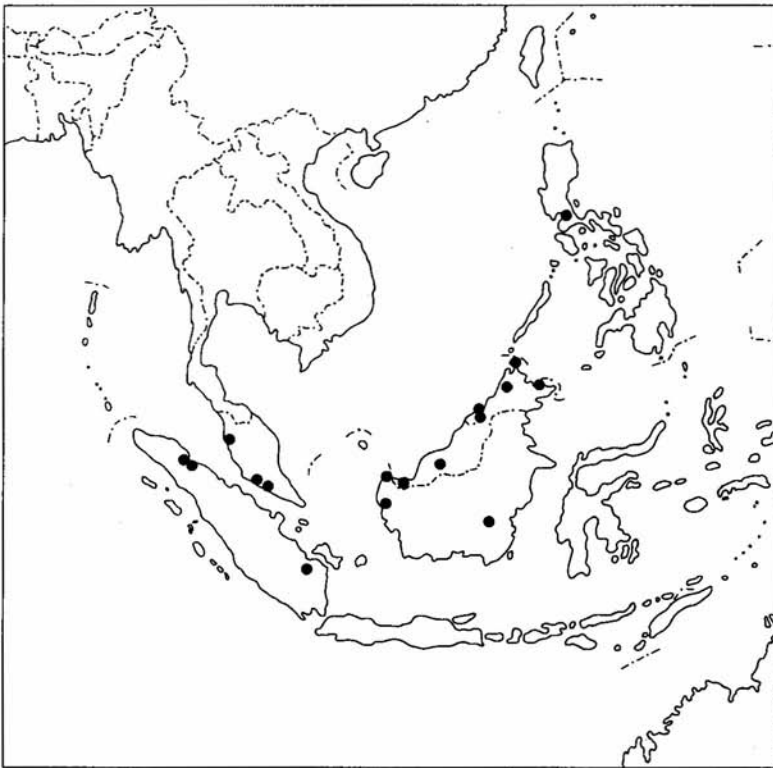
tubercle (fig. 191), without impressions. Puncturation regular, moderately coarse to fine, on slope barely marked. Intervals mostly equal in width, approximately three to four times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with sparse hairs.

Clypeus 1.2-1.3 times wider than long, slightly convex. Labrum broad, emarginate to 1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 192).

Length ratio of antennal segments: 100: 38: 97: 65: 56: 41: 53: 50: 53: 100, segment 3 approximately 2.6 times longer than segment 2, and approximately 1.5 times than segment 4 (fig. 195).

Claws with pecten on both sides. Inner pecten with three teeth extending to 1/3 length of claw (fig. 193), outer pecten with two teeth extending to 1/4 length of claw (fig. 194).

Aedeagus slim, slightly widened apically, apex broadly rounded, with broad and obtuse apical process, only extreme apex gently curved ventrad. Ventral side with distinct, longitudinally striated membrane (figs 157-159).



196. Distribution of *Aspidimorpha dulcicula*

TYPE MATERIAL

Not found. After BOHEMAN (1862) it was described from materials of the British Museum, but specimens of *A. dulcicula* labelled "Borneo" (terra typica for the species) could not be found either in London or in Stockholm; there were only specimens from Sumatra.

DISTRIBUTION

Indonesia: Sumatra, Borneo; Malaysia: Malacca, Sabah, Sarawak; Sembilan; Philippines: Luzon (fig. 196).

***Aspidomorpha* (s. str.) *elevata* (FABRICIUS, 1801)**

(figs 160-162, 197-203, tab. 7: 1, 2, 6)

Cassida elevata FABRICIUS, 1801: 399; SCHÖNHERR, 1817: 221; ZIMSEN, 1964: 90.

Aspidomorpha elevata: BOHEMAN, 1854: 291, 1856: 111, 1862: 268; BLANCHARD, 1853: 317; GEMMINGER and HAROLD, 1876: 3649; WEISE, 1897: 103 (as syn. of *sanctaerucis*); SPAETH, 1926 c: 117; 1932 c: 136; BOROWIEC, 1990 a: 682; KIMOTO et al., 1995: 106 (in syn. of *sanctaerucis*); HAITLINGER, 1996: 985 (parasite).

Aspidomorpha elevata: BOROWIEC, 1996: 8.

Aspidomorpha (*Aspidomorpha*) *elevata*: BOROWIEC, 1999: 185.

Aspidomorpha St-Crucis v. *elevata*: SPAETH, 1900a: 23.

Aspidomorpha sanctaerucis ssp. *elevata*: SPAETH, 1914 c: 69.

Aspidomorpha Heroina BOHEMAN, 1854: 284; 1856: 110; 1862: 266; GEMMINGER and HAROLD, 1876: 3649; SPAETH, 1914 c: 543 (as syn. of *limbipennis*).

Aspidomorpha subcincta Dej.: GEMMINGER and HAROLD, 1876: 3649 (nomen nudum).

Cassida flava: DE GEER, 1775: 184, not LINNAEUS, 1758; SPAETH, 1914 e: 70 (as syn. of *sanctaerucis*).

DIAGNOSIS

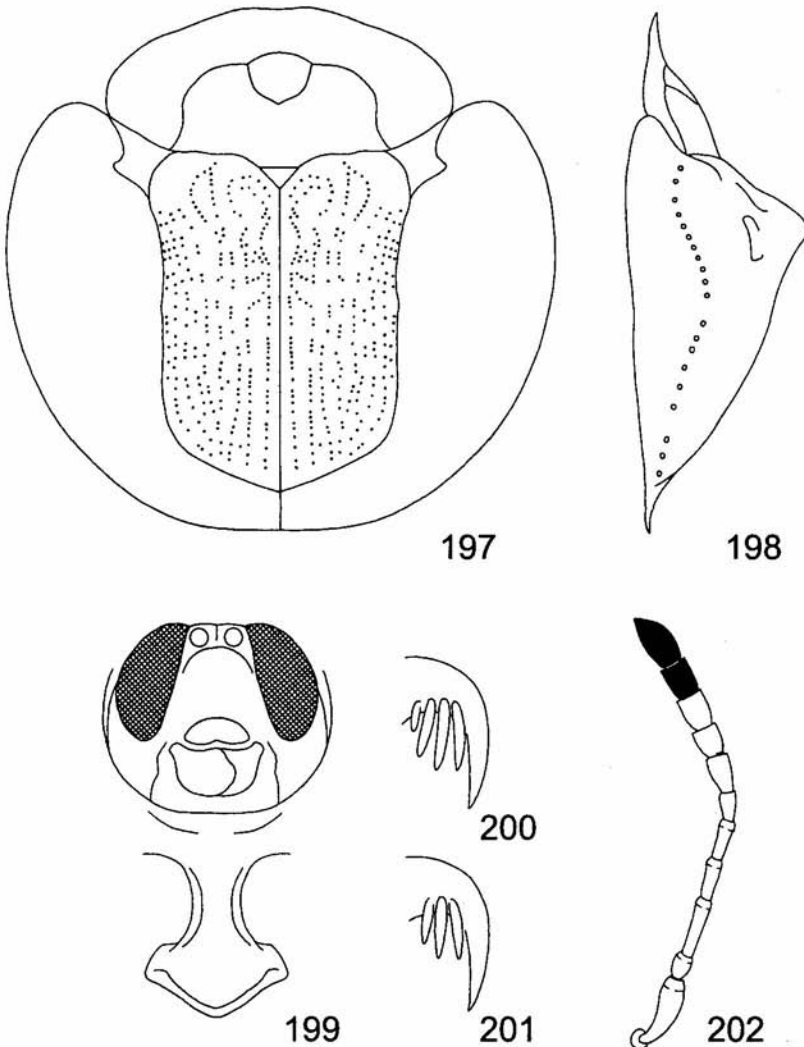
A member of *A. sanctaerucis* group. In its large size, broad body, and especially broad male explanate margin without spots it reminds *A. limbipennis*. However, *A. elevata* is distinctly smaller, body length is usually below 12.5 mm, occasionally to 13.0 mm (in *A. limbipennis* body length is always above 12.5 mm). In *A. elevata* only males are particularly broad, females usually only moderately broad, while in *A. limbipennis* both sexes are very broad, as wide as long or slightly wider. Inner pecten of claws in *A. elevata* extends beyond half length of claw, while in *A. limbipennis* it is shorter and extends at most to 2/5 length of claw. *A. elevata* is known from Thailand, Malay Pen. and Sunda Is., while *A. limbipennis* is known, without doubts, from Ceylon, and probably occurs also in NE India. Forms of *A. bataviana* without spots on explanate margin of elytra are similar to small specimens of *A. elevata*. Both species are sympatric in Sunda Is., but *A. elevata* is distinctly larger, with very distinct sexual dimorphism, especially males of *A. elevata* are distinctly stouter than males of *A. bataviana*. For differences between *A. sanctaerucis* and *A. elevata* see diagnosis under *A. sanctaerucis*.

DESCRIPTION

Male: L = 9.8-12.5; W = 9.6-12.1; Lp = 3.2-3.8; Wp = 6.3-7.5; L/W = 0.97-1.07; Wp/Lp = 1.86-2.09; Female: L = 10.8-13.0; W = 10.2-12.8; Lp = 3.4-4.2;

Wp = 6.9-8.1; L/W = 0.99-1.12; Wp/Lp = 1.87-2.02. Body very broad, in males often wider than length (fig. 197), mean size of males distinctly smaller than females. In some populations, especially from Sumatra, hypertrophic males with extremely broad marginalia were observed.

Pronotum, scutellum and disc of elytra yellow to yellowish-brown. Usually explanate margin of elytra with short humeral spots, extending to half width of explanate margin, but without posterolateral spots, often explanate margin of elytra completely without spots, rarely explanate margin with humeral spots

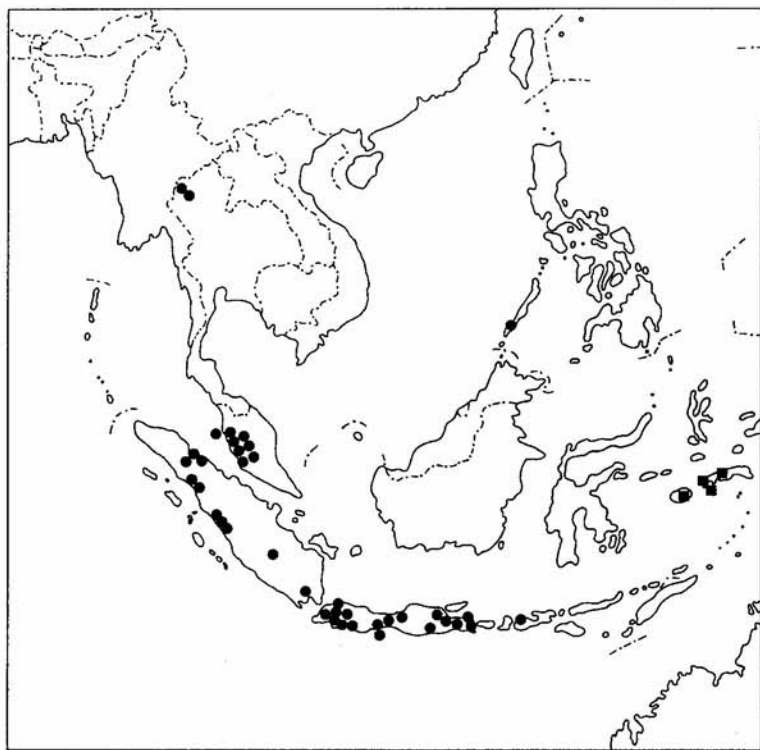


197-202. *Aspidimorpha elevata*: 197 - body in dorsal view, 198 - body in lateral view, 199 - head and prosternum, 200 - inner side of claw, 201 - outer side of claw, 202 - antenna

extending to 2/3 width of explanate margin and with posterolateral spots extending to half width of explanate margin, but humeral spots never extend to extreme margin of explanate margin. Ventrites yellow to yellowish-brown. Legs yellow. Antennae yellow, two last segments black.

Pronotum elliptical, 1.86-2.09 times wider than long, with maximum width in 1/3 basal length, sides narrowly rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra distinctly wider than base of pronotum. Humeral angles form almost right but blunt angle. Disc of elytra strongly convex, with large, conical postscutellar tubercle (fig. 198), with shallow postscutellar impressions, bordered by fold, and distinct principal impressions. Puncturation regular, moderately coarse, distinct on whole length of disc. In anterior parts of second or/and fourth intervals there are additional, scattered punctures. 2-5 punctures in a row tend to be grouped by together. Intervals mostly equal in width, approximately three times wider than punctures. Surface of intervals slightly shiny. Surface of disc, especially in anterior part, with numerous folds, appears irregular. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with sparse to moderately dense hairs.



203. Distribution of *Aspidimorpha elevata* (black circles) and *Aspidimorpha ponderosa* (black squares)

Clypeus 1.5 times wider than long, with impression in apical part. Labrum broad, emarginate to 1/5 length. Mandibles with cutting edge, without teeth. Prosternal process rhomboidal and moderately wide (fig. 199).

Length ratio of antennal segments: 100: 34: 83: 57: 57: 40: 54: 40: 48: 48: 86, segment 3 approximately 2.4 times longer than segment 2, and approximately 1.5 times than segment 4 (fig. 202).

Claws with distinct pecten on both sides. Inner pecten with four teeth extending to 2/3 length of claw, last tooth shorter than remaining (fig. 200). Outer pecten with three equal teeth extending to half length of claw (fig. 201).

Aedeagus slim, slightly widened apically, apex broadly rounded, with very small apical process. Apical part curved ventrad. Ventral side with elongate, longitudinally striated membrane (figs 160-162).

TYPE MATERIAL

Cassida elevata: type lost.

Aspidomorpha heroina: type not found; after BOHEMAN (1854) it was described from the collection of the Uppsala University.

DISTRIBUTION

Indonesia: Borneo, Java, Sumatra; Malaysia: Pahang, Perak; Philippines: Palawan (fig. 203); Thailand (?introduced).

REMARKS

The taxonomic status of *A. elevata*, and its relationships to *A. sanctaerucis* are unclear. WEISE (1897) synonymized both names, while SPAETH (1914 e) treated *A. elevata* as the subspecies of *A. sanctaerucis*. KIMOTO et al. (1995) broadly defined a species complex *A. sanctaerucis* and synonymized *A. elevata* with *A. sanctaerucis* sensu stricto. Differences between both taxa are mostly quantitative. *A. sanctaerucis* shows aberrations without spots on marginalia only occasionally, while in *A. elevata* such specimens predominate. Body colouration of *A. elevata* is always paler yellow than in *A. sanctaerucis*. Both taxa are mostly separate geographically. Only in Malaysia and Borneo they are sympatric, but were never collected in the same place. Specimens of *A. sanctaerucis* from Borneo always have both spots on marginalia, as in populations from Malaysia. The most similar morphologically to specimens of *A. elevata* (with mostly reduced spots on marginalia) are the specimens of *A. sanctaerucis* common in Hainan Is. and southern coasts of China, but *A. elevata* has never been collected in the region. The form from Hainan is probably distinct as a result of genetic drift. The overall distribution of both taxa suggests vicariance, with parapatric speciation in sympatric area. Their phylogenetic relationships need to be determined by genetic studies in the field and laboratory. See also remarks under *A. sanctaerucis*.

Aspidimorpha (s. str.) *furcata* (THUNBERG, 1789)

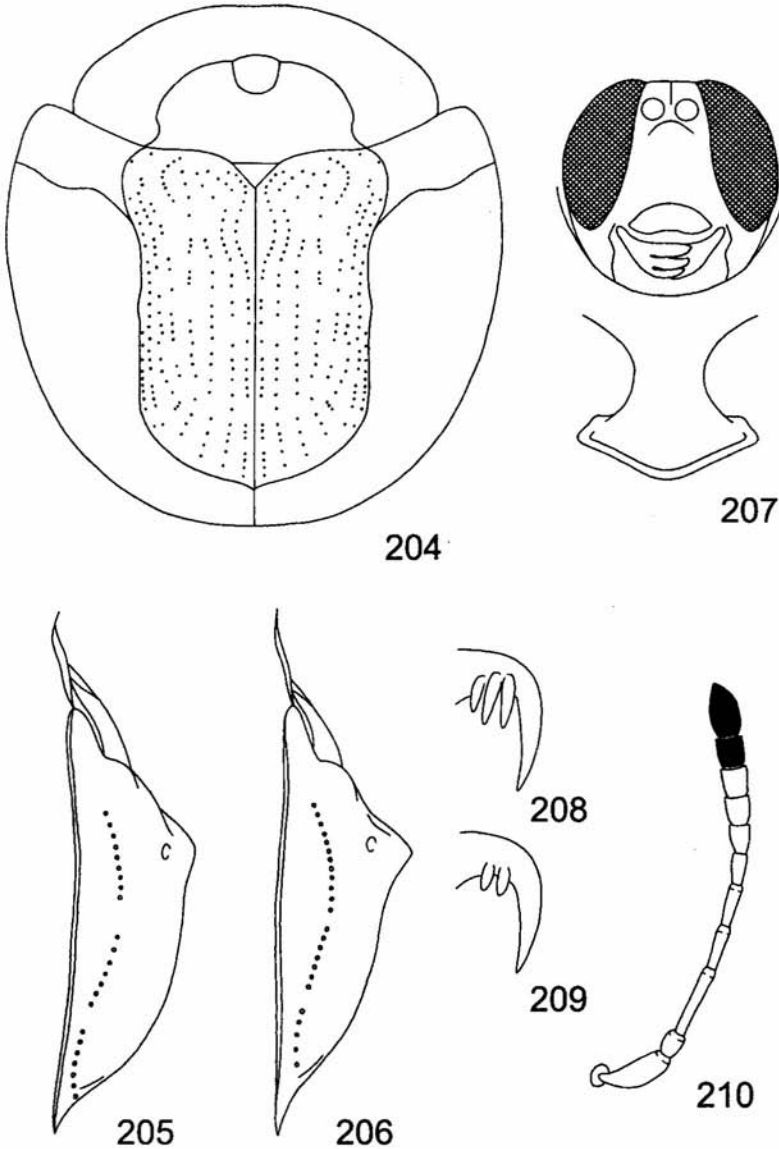
(figs 167-169, 204-221, tab. 11: 1-5)

- Cassida furcata* THUNBERG, 1789: 87; HERBST, 1799: 265; SCHÖNHERR, 1817: 221 (as syn. of *micans*).
Aspidimorpha furcata: WEISE, 1897: 104, 1901: 52, 1905: 123; GEMMINGER and HAROLD, 1876: 3649; SPAETH, 1913 e: 46, 1914 a: 15, 1914 e: 68, 1926 c: 118, 1938: 231; MAULIK, 1916: 585, 1919: 333; CHŪJŌ, 1934: 151; GRESSITT, 1938 a: 189, 1938 b: 384, 1938 c: 578, 1939: 139, 1952: 463 (incl. larva, pupa, fig.); CHEN and ZIA, 1961: 441; GRESSITT and KIMOTO, 1963: 950 (incl. fig., egg, larva, pupa); TAKIZAWA, 1978: 602, 1980a: 26 (larva, pupa), 1985: 5, 1987: 526; KIMOTO, 1981: 58, 1986: 62, 1987: 194, 1989: 271, 1991: 25, 1998: 24; MEDVEDEV and DAN, 1982: 95; MEDVEDEV and EROSHKINA, 1982: 105, 106, 1988: 124; LIZHONG, 1982: 54, 1989: 86; YU, 1983: 795, 1986: 682; ZAITSEV and MEDVEDEV, 1983: 142 (larva); BOROWIEC, 1985: 27, 1990 a: 682; BASU, 1985: 213; CHEN et al., 1986: 582, 636, pl. XIV (incl. colour fig.); BASU and HALDER, 1987: 237; BOROWIEC and TAKIZAWA, 1991: 637; KIMOTO and CHU, 1996: 133 (incl. colour photo); KIMOTO et al., 1995: 104 (incl. photo); REID, 1997: 39 (probably misidentification), 1998 b: 303; MEDVEDEV and SPRECHER-UEBERSAX, 1999: 347; MOHAMEDSAID, 2000 a: 359, 2000 b: 375.
- Aspidimorpha furcata*: BOROWIEC, 1996: 8.
Aspidimorpha (Aspidimorpha) furcata: BOROWIEC, 1999: 186.
Cassida micans FABRICIUS, 1801: 398; HAROLD, 1870: 66 (as syn. of *furcata*); SCHÖNHERR, 1817: 221; ZIMSEN, 1964: 90.
Aspidimorpha micans: BOHEMAN, 1854: 313, 1856: 114, 1862: 279.
Aspidimorpha micans: MORSBACH, 1865: 114.
Cassida dorsata OLIVIER, 1790: 386, 1808: 961 (incl. fig.); BOHEMAN, 1856: 114 (in syn. of *micans*).

DIAGNOSIS

A member of *A. furcata* group. Small body size is shared with the *A. indica* group. *A. furcata* is the most widespread and the most variable among small species of Oriental *Aspidimorpha*. Typical forms of *A. furcata* have explanate margin of elytra with only humeral spots and long inner pecten of claws. Such specimens could be similar only to *A. biremis*, *A. chandrika*, and to some aberrations of *A. assimilis*. *A. chandrika* distinctly differs in presence of sutural spot, which never occurs in *A. assimilis*, *A. biremis*, and *A. furcata*. The most important character distinguishing *A. furcata* from *A. biremis* is the structure of male genitalia. Aedeagus of *A. furcata* is distinctly widened apically, spoon-shaped, with membrane on ventral side, while aedeagus of *A. biremis*, as in the remaining species of *A. indica* group, is slim, only at the top slightly widened, without membrane on ventral side. Elytral pattern of *A. furcata* is very variable but only in exceptional cases looks like the constant elytral pattern of *A. biremis*. Both species are mostly sympatric, but predominate on different areas. *A. biremis* is common on Java and neighbouring islands, while *A. furcata* is common in the continental Oriental Region and very rare on its islands part – majority of insular records are from Sumatra and Palawan, and only a few from Java. *A. assimilis* differs from *A. furcata* in very low and obtuse postscutellar tubercle. Pattern of elytral disc in *A. assimilis* forms usually a more or less regular reticulation, while in *A. furcata* it is never reticulate, with one or two transverse bands at the most. Forms of *A. furcata* with both spots on explanate margin of elytra are similar to *A. assimilis*, *A. difformis*, *A. amabilis*, *A. indica*, *A. snizeki*, and *A. mutilata*. *A. assimilis*, *A. difformis*, and *A. snizeki* distinctly differ in lower and obtuse

postscutellar tubercle, two last species also in structure of aedeagus which is of "indica" type. *A. indica* and *A. mutilata* differ in more coarse puncturation of elytral disc, especially in posthumeral area, and in structure of aedeagus of "indica" type. The most difficult is distinguishing *A. furcata* from *A. amabilis*.

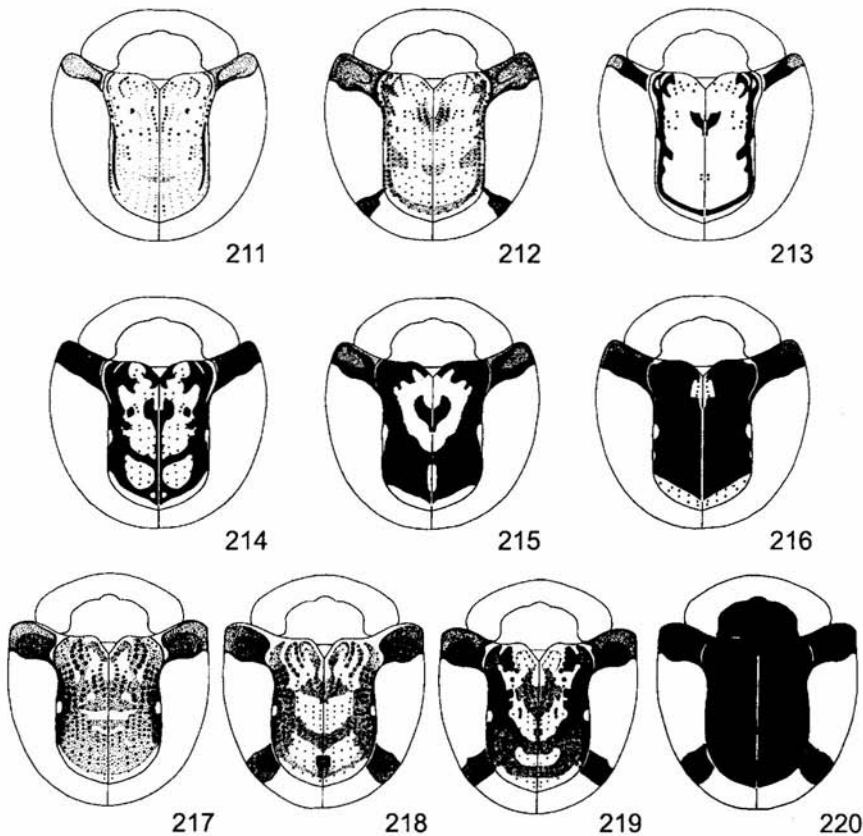


204-210. *Aspidimorpha furcata*: 204 - body in dorsal view, 205, 206 - body in lateral view (205 - population from Andamans, 206 - typical population), 207 - head and prosternum, 208 - inner side of claw, 209 - outer side of claw, 210 - antenna

Both species are partly sympatric (Sumatra, Java, Palawan), but in the sympatric area *A. furcata* is very rare, while *A. amabilis* is common. Elytral pattern of *A. amabilis* is fairly constant, with the domination of reddish colours of different saturation, while in *A. furcata* it is mostly yellowish, yellowish brown, rarely reddish but usually of different tinge than in *A. amabilis*. Body outline in *A. amabilis* is usually less regularly circular and slightly slimmer than in *A. furcata*, with almost straight margin behind humeral angles, but these differences are visible only by comparison with a series of properly identified specimens.

DESCRIPTION

L = 5.8-7.8; W = 5.1-6.9; Lp = 2.0-2.6; Wp = 3.9-5.3; L/W = 1.03-1.18; Wp/Lp = 1.87-2.12. Body almost circular (fig. 204), sexual dimorphism barely marked, male usually smaller than female.



211-220. *Aspidimorpha furcata*: variation of dorsal pattern

Very variable species. Pronotum and scutellum yellow. Disc of elytra yellow, usually with yellowish-brown to dark-brown pattern composed of a spot on posterior part of postscutellar tubercle and an elongate spot on each side of disc, connected with two transverse bands - one V-shaped in 2/3 length and another in apical part of disc (fig. 214). Elongate spots on each side of disc often darker coloured than remaining spots of pattern (figs 213,217-219). In the rare palest forms disc with yellowish-brown elongate spot on each side, along intervals 8-9, and punctures on sides of disc and across 1/3 and 2/3 elytral length marked with yellowish-brown areola (figs 211, 212). Areolae in 2/3 length of disc often form a V-shaped band, connected with an elongate spot on each side of disc. In the darkest, also rare forms, basic pattern expands to form dark-brown ring surrounding disc, with dark-brown spot in the middle of 1/3 length of disc (fig. 215), occasionally almost whole surface of disc dark-brown with yellow window behind scutellum and yellow extreme apex of disc (fig. 216), or disc completely dark-brown (fig. 220). Explanate margin of elytra usually with yellowish-brown to dark-brown humeral spots. Rarely explanate margin with humeral and posterolateral spots, most populations have only humeral spots, but single specimens with posterolateral spots are known from whole range; in S China and Palawan a form with posterolateral spots was observed more frequently than in other populations, but never exceeded 20% of all examined specimens. Common on Sumatra are specimens with posterolateral spots extending only to 1/3-1/2 width of explanate margin. Spots on explanate margin usually coloured as spots on sides of disc. Ventrites and legs yellow. Antennae yellow, last segment infusate to completely black.

Pronotum elliptical, 1.87-2.12 times wider than long, with maximum width in basal 1/3 length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra distinctly wider than base of pronotum. Humeral angles slightly protruding anterad, rounded. Disc of elytra convex, with sharp conical postscutellar tubercle (fig. 206) and shallow principal impressions, only in populations from Andaman Is. postscutellar tubercle is lower and obtuse (fig. 205). Puncturation regular, fine to moderately coarse, distinct on whole length of disc, in area behind humeral callus only slightly coarser than in central part of disc. Intervals mostly equal in width, approximately three to four times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with very sparse hairs.

Clypeus 1.4 times wider than long, slightly convex, in apical half with more or less distinct shallow impression. Labrum broad, emarginate to 1/5-1/4 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 207).

Length ratio of antennal segments: 100: 37: 109: 69: 62: 47: 44: 44: 44: 47: 87, segment 3 approximately 2.9 times longer than segment 2, and approximately 1.6 times than segment 4 (fig. 210).

Claws with distinct pecten on both sides. Inner pecten with three teeth extending to 2/5 length of claw (fig. 208), outer pecten with two teeth extending to 1/4 length of claw (fig. 209).

Aedeagus stout, spoon-shaped, apex broadly rounded, with moderately large and obtuse apical process. Apical part strongly curved ventrad. Ventral side with distinct, longitudinally striated membrane (figs 167-169).

HOST PLANTS

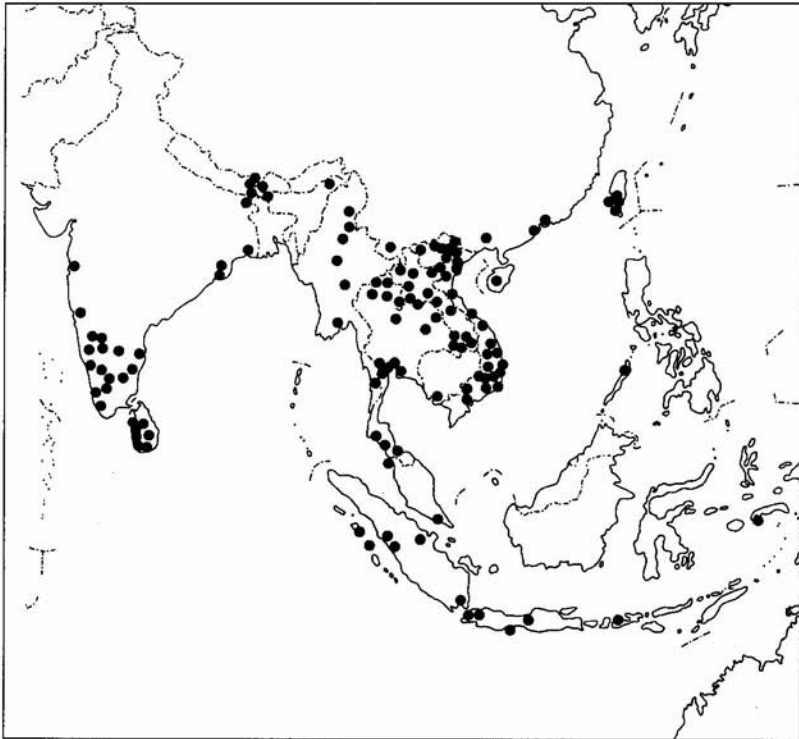
Convolvulaceae: *Ipomoea batatas*, *I. aquatica*, *I. cairica*, *I. digitata* (GRESSITT 1952); *Calystegia* sp. (TAKIZAWA 1978 b); *Ipomoea* sp. (TAKIZAWA 1980, MEDVEDEV and DAN 1982); *Argyreia nervosa* (TAKIZAWA 1985 a).

TYPE MATERIAL

Cassida furcata: type lost. Because the small species of Oriental *Aspidimorpha* are very similar and were often misidentified or misinterpreted, it is necessary to validate the name *Aspidimorpha furcata* (THUNBERG) – the commonest small Oriental member of the genus - by designation of a neotype. It is here designated: Neotype male: "INDIA, Mysore, Shimoga Distr., V.76, Agumbe Ghat, 2000 ft., T.R.S. Nathan" "Cassida furcata, NEOTYPE, des. J. Świętojańska" "Aspidimorpha furcata, det. J. Świętojańska" (IZPAS).

Cassida micans: type lost.

Cassida dorsata: type lost.



221. Distribution of *Aspidimorpha furcata*

DISTRIBUTION

Bhutan; Burma; Ceylon; S China; Philippines: Palawan; India; Indonesia: Batoe, W Java, Nias, Sumatra; Laos; Macau; Malaysia; Taiwan; Thailand; Vietnam (fig. 221).

***Aspidomorpha* (s. str.) *fusconotata* BOHEMAN, 1854**

(figs 170, 171, 222-234, 240, tab. 10: 1-3)

Aspidomorpha fusconotata BOHEMAN, 1854: 279; 1856: 109; 1862: 265; GEMMINGER and HAROLD, 1876: 3649; SPAETH, 1914 e: 68; MAULIK, 1919: 338; BOROWIEC, 1990 a: 683.

Aspidomorpha fusconotata: BOROWIEC, 1996: 9.

Aspidomorpha (*Aspidomorpha*) *fusconotata*: BOROWIEC, 1999: 186.

DIAGNOSIS

A. fusconotata and *A. orbicularis* form a distinct group, which is characterized by circular body and elytral disc without postscutellar tubercle. Both are endemic to the Philippines. *A. fusconotata* is usually larger than *A. orbicularis*. Both species have similar pattern variation on elytral disc, but forms with dark ring on elytral disc predominate in *A. orbicularis*, while in *A. fusconotata* the most common are specimens with reticulate elytra. Forms with spots on explanate margin of elytra are quite rare in *A. fusconotata*, while in *A. orbicularis* such specimens predominate. The best distinguishing character is length of inner pecten of claws. In *A. orbicularis* pecten extends only to 1/3 length of claw, while in *A. fusconotata* it extends at least to 2/5 length of claw.

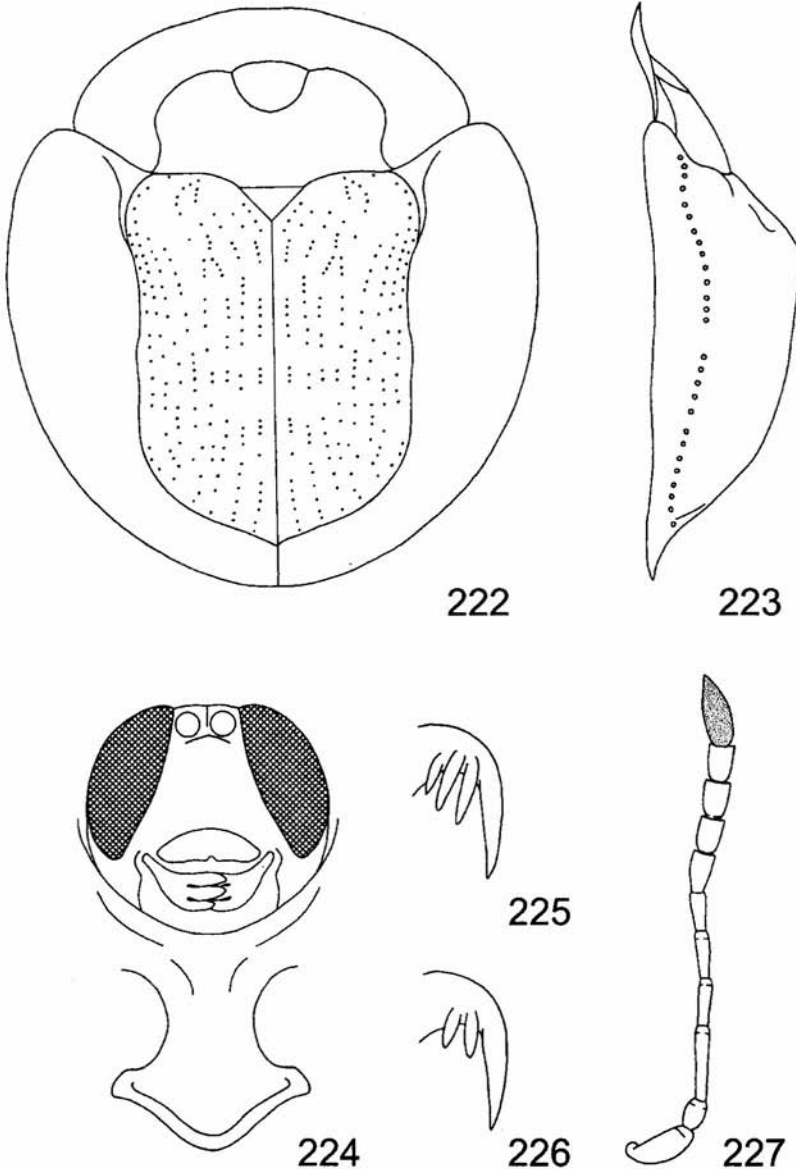
DESCRIPTION

Male: L = 7.0-7.7; W = 6.6-6.9; Lp = 2.4-2.6; Wp = 4.6-5.0; L/W = 1.06-1.13; Wp/Lp = 1.91-1.96; Female: L = 7.9-9.1; W = 7.0-8.0; Lp = 2.6-3.0; Wp = 5.0-5.5; L/W = 1.09-1.13; Wp/Lp = 1.73-2.04. Body circular (fig. 222). Sexual dimorphism barely marked, male smaller than female.

Pronotum and scutellum yellow. Disc of elytra yellow with yellowish-brown, dark brown or black pattern, which can be irregularly spread on whole surface of disc, and forms more or less regular reticulation (figs 231). Sometimes the pattern forms a broad ring (fig. 232) or is reduced to elongate spot on each side in anterior part of disc and small ring in postscutellar area (figs 228, 230). Occasionally disc of elytra only with elongate spot on each side in anterior part (fig. 229), or this spot can expand to form broad bands along sides of disc, connected in slope (figs 233, 234). Explanate margin of disc usually without spots. In forms with dark bands along sides of disc, explanate margin with humeral and posterolateral spots extending to extreme margin of elytra (figs 233, 234). Ventrites and legs yellow. Antennae yellow, often last segment at the top infuscate, rarely completely black.

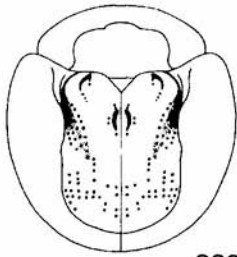
Pronotum elliptical, 1.73-2.04 times wider than long, with maximum width in 1/3 basal length, with rounded sides. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra wider than base of pronotum. Humeral angles rounded and slightly protruding anterad. Disc of elytra regularly convex, slightly elevated in postscutellar area, but without postscutellar tubercle (fig. 223), with very shallow principal impressions and without postscutellar and lateral impressions. Puncturation moderately coarse and regular, distinct along whole length of disc.

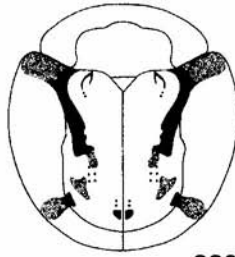


222-227. *Aspidimorpha fusconotata*: 222 - body in dorsal view, 223 - body in lateral view, 224 - head and prothorax, 225 - inner side of claw, 226 - outer side of claw, 227 - antenna

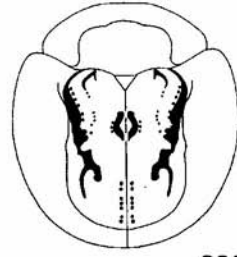
Intervals equal in width, approximately three times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with very sparse hairs. In male hairs sparser than in female.



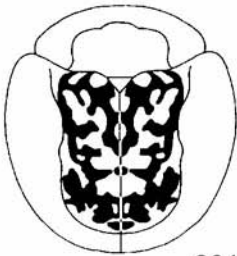
228



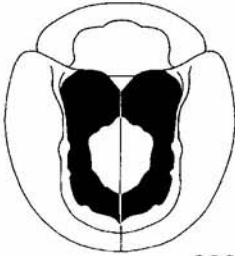
229



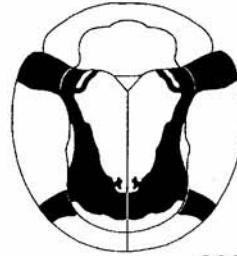
230



231



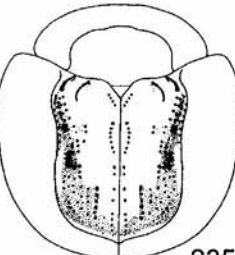
232



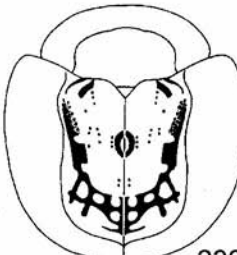
233



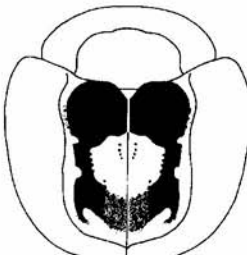
234



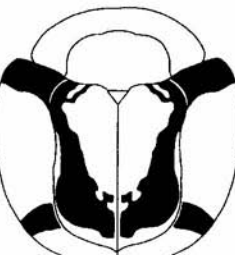
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236



237



238



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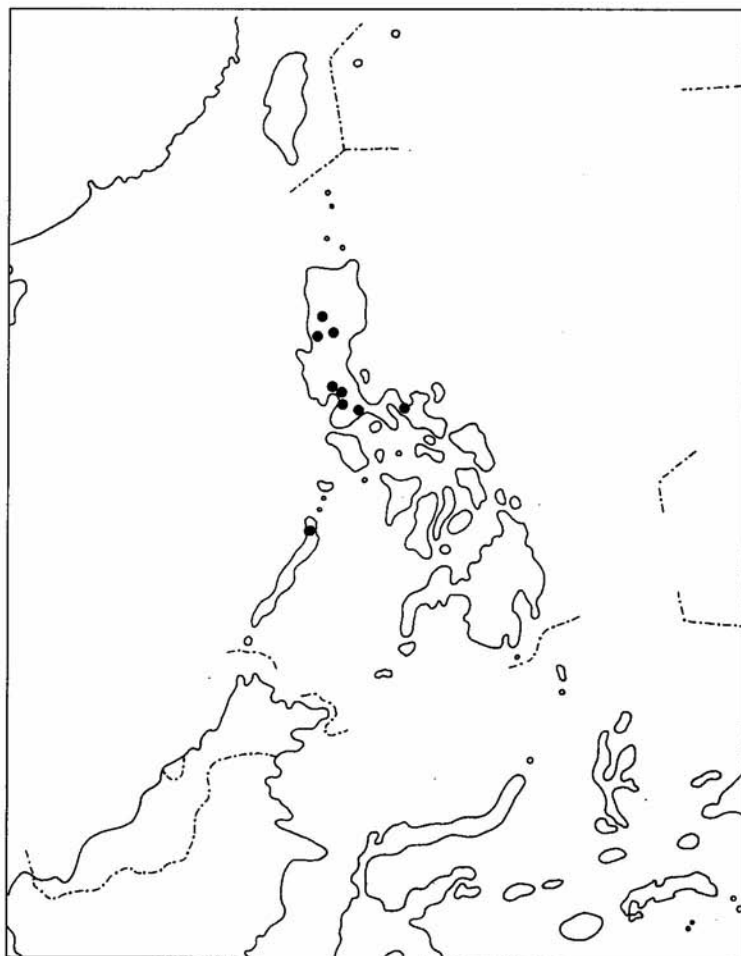
228-239. Variation of dorsal pattern: 228-234 - *Aspidimorpha fusconotata*; 235-239 - *A. orbicularis*

Clypeus 1.5 times wider than long, slightly convex. Labrum broad, emarginate to $1/4-1/3$ length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, and without impression (fig.224).

Length ratio of antennal segments: 100: 43: 110: 70: 70: 56: 56: 50: 50: 50: 106, segment 3 approximately 2.6 times longer than segment 2, and approximately 1.6 times longer than segment 4 (fig. 227).

Claws with distinct pecten on both sides. Inner pecten with three teeth extending to $2/5-1/2$ length of claw (fig. 225), outer pecten with two teeth extending to $1/3$ length of claw (fig. 226).

Aedeagus slim, slightly widened apically, or almost parallel-sided, apex broadly rounded with broad and obtuse apical process. Apical part gently curved ventrad. Ventral side without membrane (figs 170, 171).



240. Distribution of *Aspidimorpha fusconotata*

TYPE MATERIAL

Lectotype: "Ind or" "M. Gall." "Type" (NRS) – designated by BOROWIEC (1999); 2 paralectotypes: "Manilla" "Brit. Mus." (NRS); 4 paralectotypes "Ins. Philipp. fusconotata Boh.* Cum." "29286" (ZMHU).

DISTRIBUTION

Philippines: Luzon, N Palawan (fig. 240).

***Aspidomorpha* (s. str.) *fuscopunctata* BOHEMAN, 1854**

(figs 241-250, 294-296, tab. 9: 3, 4)

Aspidomorpha fuscopunctata BOHEMAN, 1854: 298; 1856: 112; 1862: 270; GEMMINGER and HAROLD, 1876: 3649; WEISE, 1892 c: 385; 1897: 104; SPAETH, 1900: 23; 1912 d: 117; 1914 e: 68, 1926 a: 308; 1926 c: 118; 1932 c: 136; 1938: 231; MAULIK, 1919: 326; GRESSITT, 1938 a: 189; 1938c: 579; 1939: 140; 1952: 464; HINCKS, 1953: 69; CHEN and ZIA, 1961: 441; GRESSITT and KIMOTO, 1963: 952; KIMOTO, 1998: 27; MEDVEDEV and DAN, 1982: 95; MEDVEDEV and EROSHKINA, 1982: 105, 106; 1988: 125; LIZHONG, 1982: 54; 1989: 86; ZAITSEV and MEDVEDEV, 1983: 142 (larva); YU, 1983: 796; BOROWIEC, 1985: 27; 1990 a: 683; CHEN et al., 1986: 583, 636; BOROWIEC and TAKIZAWA, 1991: 638; MOHAMEDSAID, 1994: 370, 2000 a: 359; KIMOTO et al., 1995: 105 (incl. photo); REID, 1997: 39; MEDVEDEV and SPRECHER-UEBERSAX, 1999: 348.

Aspidomorpha fuscopunctata: BOROWIEC, 1996: 9.

Aspidomorpha (Aspidomorpha) fuscopunctata: BOROWIEC, 1999: 186.

Aspidomorpha fuscopunctata ab. *corporeali* SPAETH, 1926 a: 308.

Aspidomorpha rubrodorsata BOHEMAN, 1854: 310; 1856: 114; 1862: 278; GEMMINGER and HAROLD, 1876: 3650.

Aspidomorpha fuscopunctata var. *rubrodorsata*: SPAETH, 1912 d: 117.

Aspidomorpha fuscopunctata ab. *rubrodorsata*: SPAETH, 1914 e: 68.

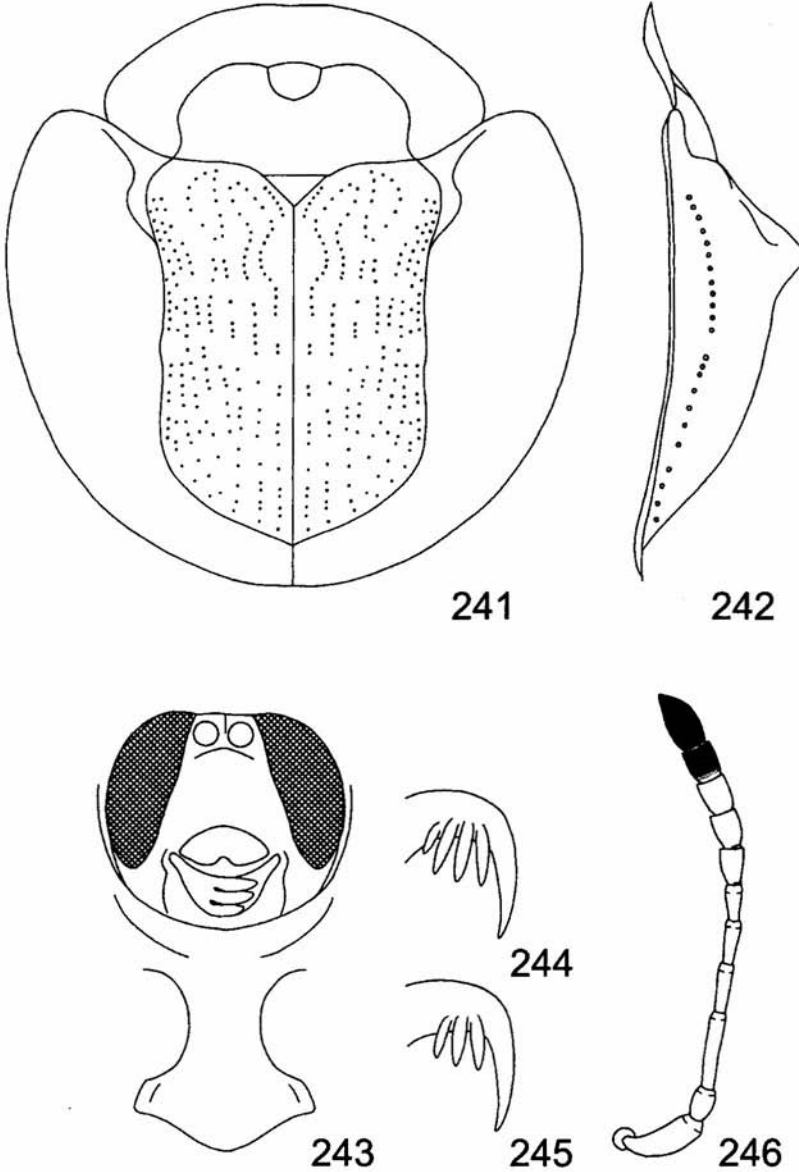
Aspidomorpha dorsata: TAKIZAWA, 1980 a: 25 (misidentification, larva); 1985 a: 4 (incl. photo); 1986: 45; 1987: 526.

DIAGNOSIS

A moderately large species within the *A. dorsata* group, next to *A. dorsata* the most common species of the group. The most common forms without spots on explanate margin or with short humeral spots extending to 1/3 width of explanate margin are unique and easy to identify. Similar are small specimens *A. dorsata* and specimens of *A. limbata* with reduced dark pattern on elytral disc. In *A. dorsata* humeral spots on explanate margin are usually darker coloured than ground colour of elytral disc and usually extend to extreme margin of explanate margin; specimens of *A. dorsata* often have dark pattern on elytral disc, while in *A. fuscopunctata* disc usually without pattern, as most punctures are marked with dark areola and form V-shaped pattern across 2/3 length of disc. *A. dorsata* is usually larger, with body length above 10 mm, while specimens of *A. fuscopunctata* only occasionally reach 10 mm and usually their body length is between 8.0 to 9.5 mm. *A. limbata* differs in dark pattern on elytral disc, slimmer body, and shorter inner pecten of claws extending at most to 1/3 length of claw. Other species of *A. dorsata* group with only humeral spots on elytral marginalia, and without elytral pattern differ in short pecten of claws, extending at most to 1/3 length of claw.

DESCRIPTION

Male: $L = 8.0-9.2$; $W = 7.5-8.8$; $Lp = 2.6-2.9$; $Wp = 5.0-5.4$; $L/W = 1.04-1.07$; $Wp/Lp = 1.82-1.96$; Female: $L = 8.9-10.0$; $W = 8.4-9.2$; $Lp = 2.8-3.2$; $Wp = 5.4-6.2$; $L/W = 1.03-1.10$; $Wp/Lp = 1.89-2.03$. Body circular (fig. 241), sexual dimorphism barely marked, male slightly smaller and stouter than female.



241-246. *Aspidimorpha fuscopunctata*: 241 - body in dorsal view, 242 - body in lateral view, 243 - head and prosternum, 244 - inner side of claw, 245 - outer side of claw, 246 - antenna

Pronotum and scutellum yellow to yellowish-brown. Disc of elytra yellow with punctures marked with yellowish-brown, reddish-brown to brown areola. Areolae on sides and on top of disc usually larger and darker than on remaining part of disc, often form V-shaped pattern across $2/3$ length of disc. In the darkest specimens areolae on sides and on top of disc expand and coalesce to form distinct V-shaped brown band, but disc never uniformly brown or with large brown spots. Explanate margin of elytra always without posterolateral and sutural spots, and usually with short yellowish-brown humeral spots extending to $1/3$ - $1/2$ width of explanate margin, occasionally humeral spots extending to extreme margin of elytra, but they are never as dark coloured as punctures on sides of disc (figs 247-249). Ventrites and legs yellow. Antennae yellow, usually last segment black and penultimate segment infusate or black, rarely only last segment infusate, occasionally whole antennae yellow.

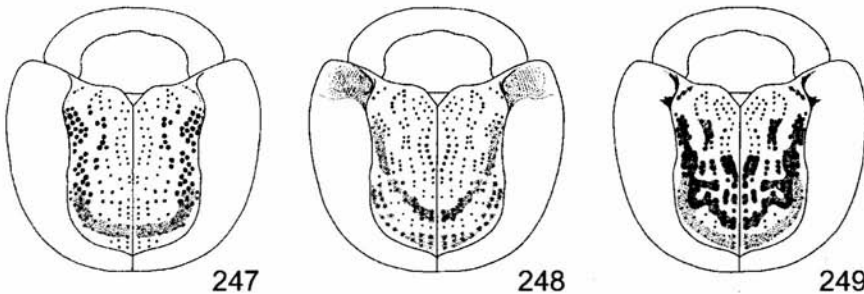
Pronotum elliptical, 1.87-2.03 times wider than long, with maximum width in $2/5$ basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra distinctly wider than base of pronotum. Humeral angles rounded and slightly protruding anterad. Disc convex, with large, conical postscutellar tubercle (fig. 242), barely marked principal impressions, without postscutellar and lateral impressions. Puncturation moderately coarse, distinct on whole length of disc, regular. Intervals equal in width, approximately five times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with very sparse hairs.

Clypeus 1.6 times wider than long, slightly convex. Labrum broad, emarginate to $1/4$ - $1/3$ length. Mandibles with distinct teeth. Prosternal process rhomboidal, broad, without impression (fig. 243).

Length ratio of antennal segments: 100: 41: 100: 62: 56: 47: 47: 44: 44: 44: 85, segment 3 approximately 2.4 times longer than segment 2, and approximately 1.6 times longer than segment 4 (fig. 246).

Claws with distinct pecten on both sides. Inner pecten with four teeth extending to $2/3$ length of claw, last tooth smaller than remaining, extending to half length of first tooth (fig. 244). Outer pecten with three teeth extending to half length of claw (fig. 245).



247-249. *Aspidimorpha fuscopunctata*: variation of dorsal pattern

Aedeagus slim, widened apically, apex broadly rounded with broad and obtuse apical process. Apical part strongly curved ventrad. Ventral side with distinct longitudinally striated membrane (figs 294-296).

HOST PLANT

Convolvulaceae: Ipomoea sp. (TAKIZAWA 1980, MEDVEDEV et DAN 1982).

TYPE MATERIAL

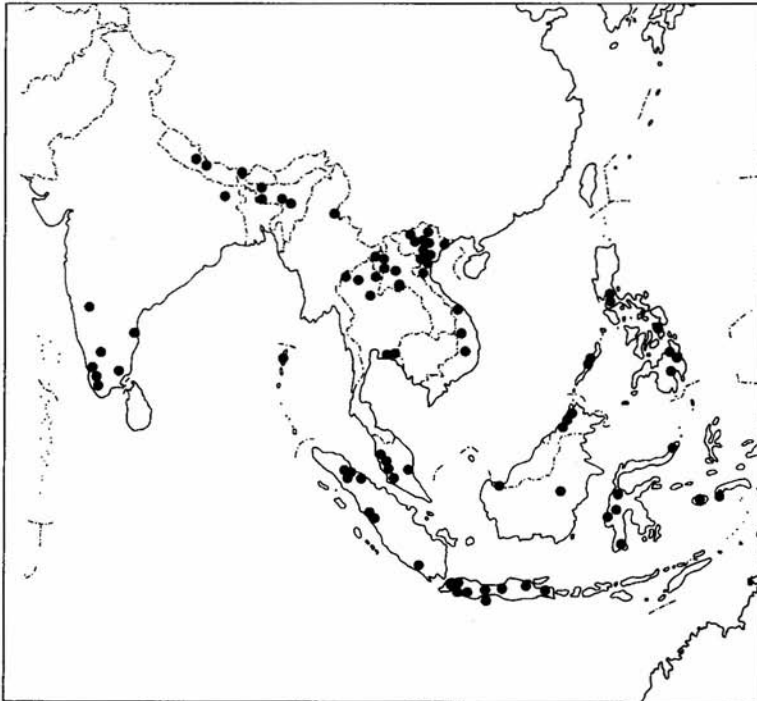
Aspidomorpha fuscopunctata: lectotype and paralectotype "Java" "Mellb." "Type" (NRS) – designated by BOROWIEC (1999).

Aspidomorpha rubrodorsata: holotype: "Java" "Westrm." "Type" (NRS).

Aspidomorpha fuscopunctata ab. *corporaali*: holotype: "Sumatra Medan" "type" (MM).

DISTRIBUTION

Burma; S China: Guangdong, Guangxi, Hainan, Yunnan; India; Indonesia: Borneo, Java, Nias Is., Sulawesi, Sumatra; Laos; Malaysia; Philippines: Leyte, Luzon, Mindanao, Palawan; Thailand; Vietnam (fig. 250).



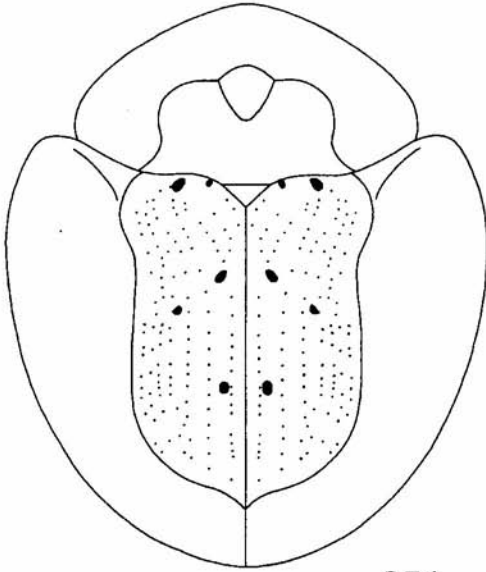
250. Distribution of *Aspidomorpha fuscopunctata*

***Aspidomorpha* (s. str.) *hexaspilota* BALY, 1863, bona species**

(figs 251-261, 566-568, tab. 4: 7, 8)

Aspidomorpha hexaspilota BALY, 1863: 11, 13; GEMMINGER and HAROLD, 1876: 3649; SPAETH, 1914 e: 68; BOROWIEC, 1990 a: 684; KIMOTO et al., 1995: 105 (as syn. of *miliaris*).

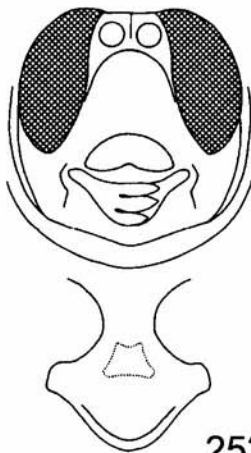
Aspidomorpha (*Aspidomorpha*) *hexaspilota*: BOROWIEC, 1999: 187.



251



252



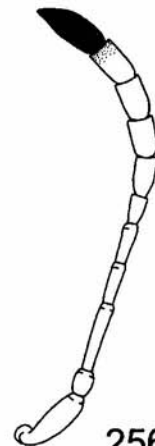
253



254



255



256

251-256. *Aspidomorpha hexaspilota*: 251 - body in dorsal view, 252 - body in lateral view, 253 - head and prosternum, 254 - inner side of claw, 255 - outer side of claw, 256 - antenna

DIAGNOSIS

At first glance this species is very similar to small specimens of *A. miliaris* without or with reduced pattern on elytral disc. *A. hexaspilota* is distinctly smaller than *A. miliaris*, with body length of both sexes below 9.4 mm, while the smallest females of *A. miliaris* reach 11.5 mm and the smallest males 9.7 mm, but such small specimens of *A. miliaris* are very rare. In populations of *A. miliaris* from continental Asia elytral disc is usually with complete pattern, specimens with only few spots, like in *A. hexaspilota*, appear mainly on New Guinea. In *A. hexaspilota* only last antennal segment is black and segments 9-10 at most slightly infuscate, while in *A. miliaris* usually two, sometimes three or four last antennal segment are black to strongly infuscate. External black spot at basal margin of elytra, if present, in *A. hexaspilota* is placed in impression before humeral callus, while in *A. miliaris* it is placed on humeral callus. Surface of elytra in *A. hexaspilota* is very glabrous, with mirror tint, while in *A. miliaris* is often slightly dull, or only slightly glabrous. *A. hexaspilota* has a small range limited to central part of Indochina, while *A. miliaris* has the widest range, including the whole Oriental and Australian Regions.

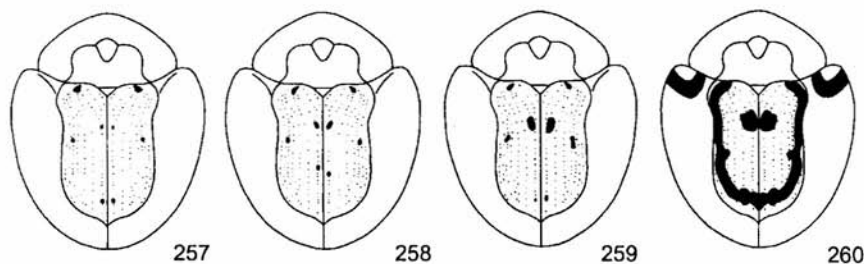
DESCRIPTION

L = 9.1-9.3; W = 8.4-8.5; Lp = 3.1; Wp = 5.8-6.0; L/W = 1.08-1.09; Wp/Lp = 1.87-1.93. Body circular (fig. 251), sexual dimorphism barely marked.

Pronotum and scutellum yellow. Disc yellow, in typical form with black spots at base of second and fourth intervals. In some specimens there are also spots in 1/4 and 2/3 length of second interval, in half length of fourth interval. Occasionally, disc of elytra surrounded by narrow, black ring. Explanate margin of elytra yellow usually without spots (fig. 257-259), occasionally with narrow humeral spots, does not extend to humeral part of marginalia (fig. 260). Ventrites and legs yellow. Antennae yellow, last segment black, sometimes segments 9 and 10 slightly infuscate (fig. 256).

Pronotum elliptical, 1.93 times wider than long, with maximum width in 1/4 basal length, sides rounded. Disc slightly convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra distinctly wider than base of pronotum. Humeral angles rounded. Disc of elytra regularly convex, with top of convexity in postscutellar point,



257-260. *Aspimorpha hexaspilota*: variation of dorsal pattern

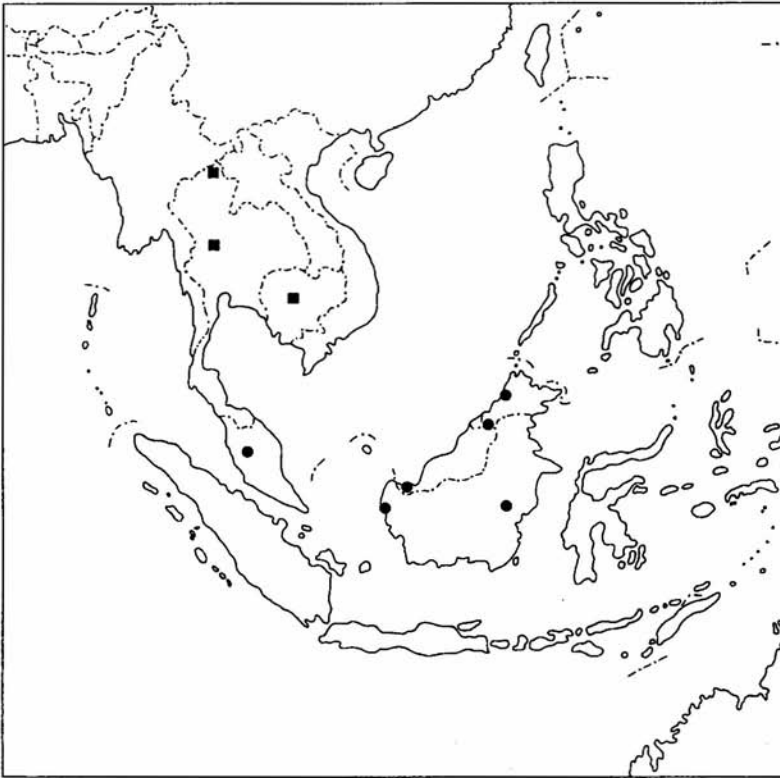
without tubercle (fig. 252) and impressions. Puncturation in anterior part of disc fine, gradually finer posterad, on slope barely marked. Intervals flat, mostly equal in width, approximately four to five times wider than punctures. Surface of intervals glabrous, mirror. Explanate margin of elytra glabrous. Apex of elytral epipleura with few, long, erect hair.

Clypeus 1.5 times wider than long, slightly convex. Labrum broad, emarginate to 1/3 length. Mandibles with teeth. Prosternal process rhomboidal, moderately wide, with barely marked impression in the middle (fig. 253).

Length ratio of antennal segments: 100: 35: 94: 57: 56: 38: 50: 51: 56: 56: 100, segment 3 approximately 2.7 times longer than segment 2, and approximately 1.6 times than segment 4 (fig. 256).

Claws with distinct pecten on both sides. Inner pecten with four, almost equal, teeth extending to 1/3-2/5 length of claw (fig. 254), outer pecten with two teeth extending to 1/4 length of claw (fig. 255).

Aedeagus slim, almost parallel-sided, apical part gently curved ventrad, apex with small and broad apical process. Ventral surface only close to apex with small membrane (figs 566-568).



261. Distribution of *Aspidimorpha hexaspilota* (black squares) and *Aspidimorpha sarawacensis* (black circles)

TYPE MATERIAL

Holotype: "Cambodja" "Type" (BMNH).

DISTRIBUTION

Cambodja, Laos and Thailand. Little known species, only 7 specimens were collected hitherto (fig. 261).

REMARKS

KIMOTO et al. (1995) synonymized *A. hexaspilota* with *A. miliaris*. It is true, at first glance *A. hexaspilota* looks like a very small specimen of *A. miliaris* with mostly reduced elytral pattern, but differs in many constant characters (see diagnosis) and, undoubtedly is a distinct species with the distribution area limited to Indochina.

***Aspidomorpha* (s. str.) *indica* BOHEMAN, 1854**

(figs 262-278, 297-298, tab. 13: 4-6)

Aspidomorpha indica BOHEMAN, 1854: 318, 1856: 115, 1862: 280; GEMMINGER and HAROLD, 1876: 3649; WEISE, 1905: 123; SPAETH, 1913: 46, 1914 a: 15, 1914 e: 68, 1938: 231; MAULIK, 1919: 327; CHŪJŌ, 1934: 153; GRESSITT, 1939: 140; 1952: 465; CHEN and ZIA, 1961: 441; GRESSITT and KIMOTO, 1963: 952; KIMOTO and TAKIZAWA, 1973: 180; KIMOTO, 1981: 58; 1991: 25; MEDVEDEV and DAN, 1982: 95; MEDVEDEV and EROSHKINA, 1982: 105, 106; 1988: 124 (as syn. of *A. furcata* Th.); LIZHONG, 1982: 54; 1989: 86; YU, 1983: 795; TAKIZAWA: 1985: 5; BOROWIEC, 1985: 26; 1990 a: 684; CHEN et al., 1986: 584, 636 (incl. male gen.); BASU and HALDER, 1987: 237; KIMOTO and CHU, 1996: 133 (in syn. of *furcata*); KIMOTO et al., 1995: 104 (in syn. of *furcata*); MOHAMEDSAID, 2000 b: 375.

Aspidomorpha indica: BOROWIEC, 1996: 9.

Aspidomorpha (*Aspidomorpha*) *indica*: BOROWIEC, 1999: 188.

Aspidomorpha egena BOHEMAN, 1854: 317, 1856: 115, 1862: 280; GEMMINGER and HAROLD, 1876: 3649; WEISE, 1897: 104; SPAETH, 1914 e: 68; MAULIK, 1919: 327 (as syn. of *indica*).

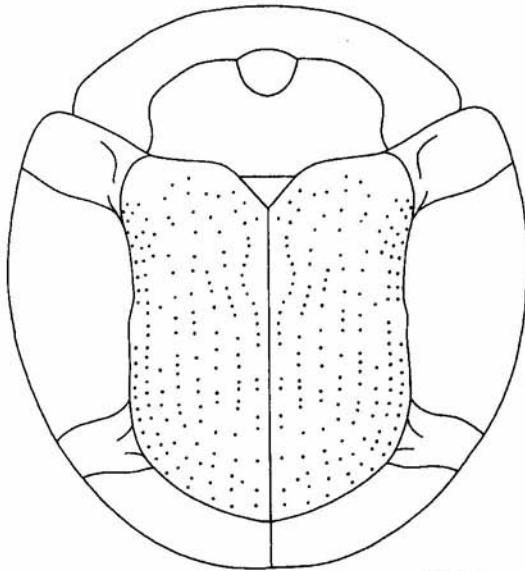
Aspidomorpha sumatrana SPAETH, 1904: 74, 1914 e: 70, 1926 c: 118; BOROWIEC, 1990 a: 689, n. syn.

Aspidomorpha (*Aspidomorpha*) *sumatrana*: BOROWIEC, 1999: 201.

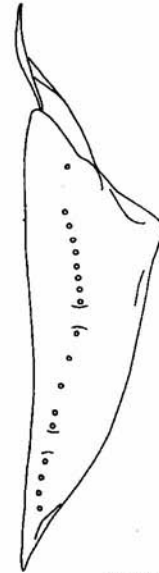
DIAGNOSIS

A member of *A. indica* group. Because of its small size it also is similar to the species of *A. furcata* group. The most similar to *A. indica* are *A. difformis* and *A. snizeki*. *A. difformis* differs in lower and obtuse postscutellar tubercle and apical part of aedeagus very strongly curved ventrad. Both species are mostly separated geographically. *A. difformis* is generally an eastern Palaearctic species, while *A. indica* is widespread in the Oriental Region, especially its continental part, only in Taiwan and S China both are sympatric. *A. snizeki* is very similar, but differs in lower and obtuse postscutellar tubercle, much more dense elytral puncturation, and shorter pecten of claws, extending to 1/3 length of claw (in *A. indica* to 2/5-1/2 length of claw). Also, a form of *A. furcata* with both spots on explanate margin is similar to *A. indica* but differs in finer puncturation of elytral sides and, especially in a spoon-shaped aedeagus. *A. amabilis* differs in finer elytral puncturation and spoon-shaped aedeagus. Only in *A. mutilata* the

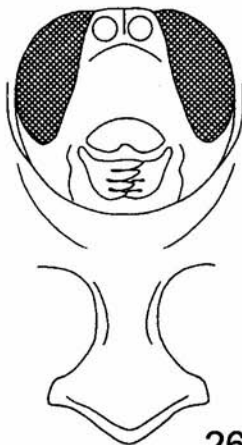
puncturation of lateral part of disc is as strong as or even stronger than in *A. indica*, and its aedeagus is very similar to that of *A. indica*. However, *A. indica* is usually slightly larger (length 6.2-8.5, in *mutilata* 5.9-8.0 mm), with indistinct sexual dimorphism (well pronounced in *A. mutilata*). *A. mutilata* is mainly isular: it is common on Java, Bali, Lombok, rare on Sumatra; in continental



262



263



264



265



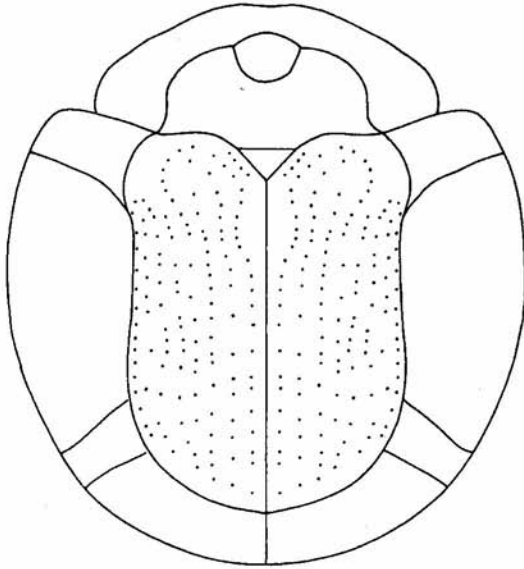
266



267

262-267. *Aspidimorpha indica*, typical form: 262 - body in dorsal view, 263 - body in lateral view, 264 - head and prosternum, 265 - inner side of claw, 266 - outer side of claw, 267 - antenna

Asia recorded only from the Pahang province of Malaysia, while *A. indica* is mostly continental, sympatric with *A. mutilata* only in southern Malaysia and Sumatra.



268



269



270



271



272



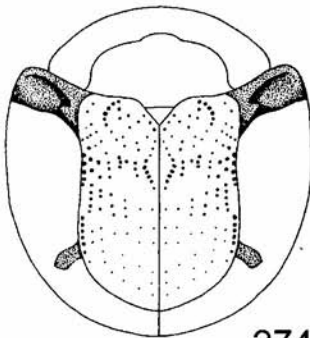
273

268-273. *Aspidimorpha indica* from Sumatra: 268 - body in dorsal view, 269 - body in lateral view, 270 - head and prosternum, 271 - inner side of claw, 272 - outer side of claw, 273 - antenna

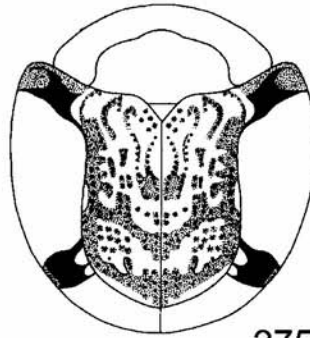
DESCRIPTION

L = 6.2-8.5; W = 5.5-7.0; Lp = 1.9-2.7; Wp = 3.7-5.2; L/W = 1.09-1.28; Wp/Lp = 1.18-2.15. Body broadly-oval (fig. 262), sexual dimorphism indistinct.

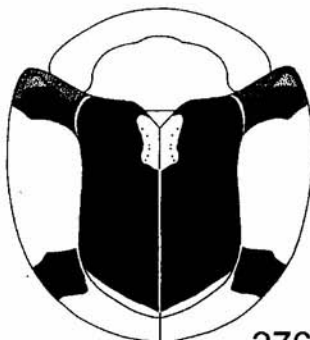
Pronotum and scutellum yellow. In extremely dark specimens pronotal disc infusate to brown. Disc of elytra yellow, with punctures marked with yellowish-brown to dark-brown areola. Areolae on sides and on the top of disc usually larger and darker than elsewhere, with a tendency to increase and coalesce (fig. 274). Increased areolae form yellowish-brown pattern with ring surrounding disc, connected with V-shaped transverse band at 2/3 of disc length, often with a spot on the top of postscutellar tubercle (fig. 275). Rarely almost whole disc dark brown with yellow window in postscutellar area and yellow stripe along the posterior border of disc (fig. 276) or whole elytral disc dark brown (fig. 277). Explanate margin of elytra with humeral and posterolateral spots yellowish-brown to dark brown (figs 274-277). Usually spots on explanate margin darker than spots on disc. Humeral spots always extend to margin of elytra, posterolateral spots sometimes shortened, extending only to 2/3 width of marginalia. Ventrites and legs yellow. Antennae yellow, last segment infusate or black. Sometimes, when last segment black, penultimate segment infusate. In populations from Sumatra antennae usually uniformly yellow.



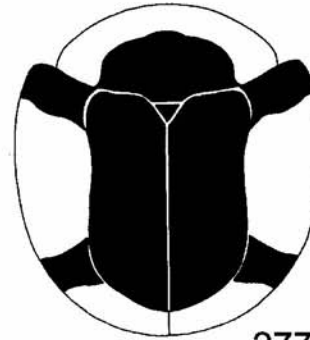
274



275



276

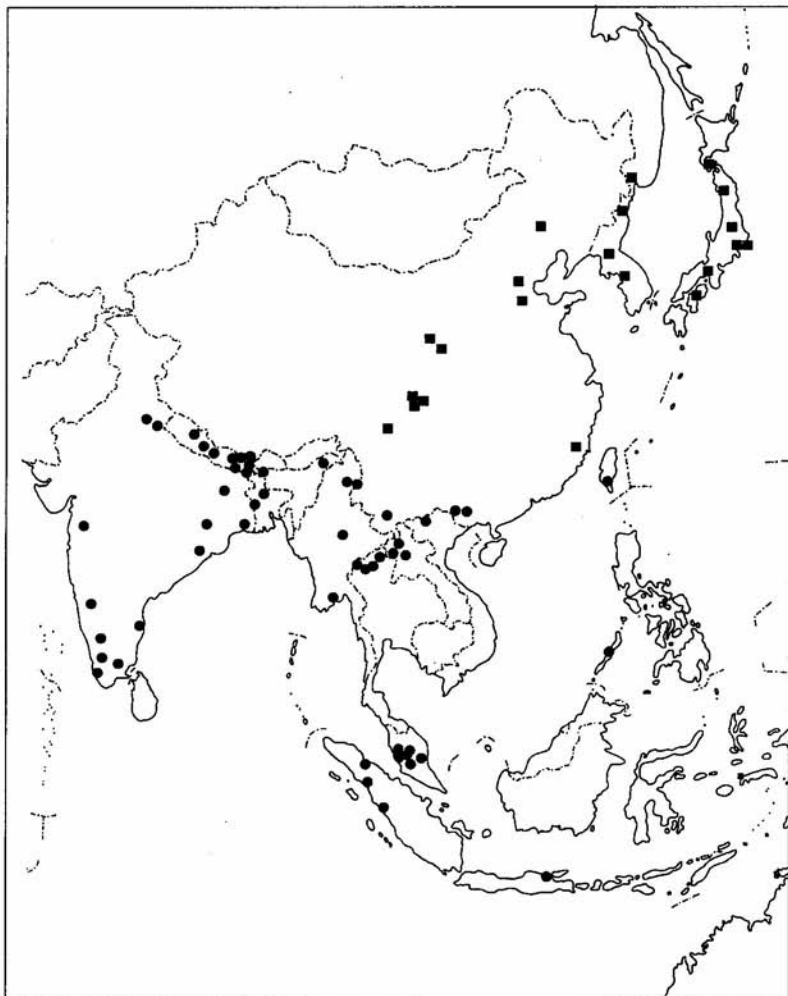


277

274-277. *Aspidimorpha indica*: variation of dorsal pattern

Pronotum elliptical, 1.82-2.15 times wider than long, with maximum width at 1/3 basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra wider than base of pronotum. Humeral angles slightly protruding anterad, rounded. In some specimens from Sumatra, the margin of elytra behind humeral angles is straight or shallowly emarginate and then humeral angles appear slightly angulate. Disc of elytra convex, with conical postscutellar tubercle (fig. 263), and shallowly marked principal impressions. In specimens from the northern part of the range (S China) the postscutellar tubercle is slightly lower



278. Distribution of *Aspidimorpha indica* (black circles) and *Aspidimorpha difformis* (black squares)

than in specimens from the central and the southern parts of the range, but its top is always acute. Puncturation regular, moderately coarse, distinct along the whole length of disc. In area behind humeral callus puncturation is distinctly coarser than on top and in posterior part of disc. Intervals mostly equal in width, approximately three to four times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with sparse hairs.

Clypeus 1.6 times wider than long, slightly convex. Labrum broad, emarginate to 1/4-1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 264).

Length ratio of antennal segments: 100: 42: 109: 68: 64: 42: 51: 51: 55: 58: 100, segment 3 approximately 2.6 times longer than segment 2, and approximately 1.6 times than segment 4 (fig. 267).

Claws with distinct pecten on both sides. Inner pecten with four teeth extending to 2/5-1/2 length of claw (fig. 265), outer pecten with two or three teeth extending to 1/3 length of claw (fig. 266). Last tooth of both pectens shorter than remaining teeth.

Aedeagus slim, almost parallel-sided, apex broadly rounded, with obtuse apical process. Apical part moderately curved ventrad. Ventral side without membrane (figs 297, 298).

HOST PLANTS

Convolvulaceae: Ipomoea japonicus (Gressitt, 1952); *Ipomoea* sp. (Medvedev et Dan, 1982).

TYPE MATERIAL

Aspidomorpha indica: type lost.

Aspidomorpha egena: holotype: "Bengal" "Mhm" "Type" (NRS).

Aspidomorpha sumatrana: 4 syntypes: "Sumatra, Pangherang-Pisang, X 90 e III 91, E. Modigliani" "Type" (2 MCSNG, 2 MM); syntype: "Sumatra, Pangherang, Pisang, 1890-91, E. Modigliani" (ZMK); syntype: "Sumatra, Mt Singalang, Luglio 1878, D. Beccari" (MCSNG); syntype: "Sumatra, Si-Rambé, XII 90-III 91, E. Modigliani" (MCSNG); syntype: "Sumatra, Pea Ragia, X 1890, E. Modigliani" (MCSNG).

DISTRIBUTION

Bangladesh; Burma; S China: Sichuan, Yunnan; India; Indonesia: Sumatra; Laos; Malaysia; Nepal; Philippines: Palawan; Sikkim; Taiwan; Thailand (fig. 278).

REMARKS

Specimens from the northern part of the range (S China, Palawan) have elytral tubercle lower and less acute than specimens from the southern part. Because specimens of *A. difformis* from the southern part of its range (S China, Guizhou) have elytral tubercle higher and more angulate than specimens from NE China,

Korea and Japan, there is a problem with correct identification of specimens of both species from the sympatric area. In these cases only the male genitalia are diagnostic. SPAETH (1904) described *A. sumatrana* from Sumatra (figs 268-273). In comparison with continental specimens of *A. indica* those from Sumatra differ only in generally paler yellow dorsal side, usually uniformly yellow antennae and, in some specimens, shallowly emarginate margin of elytra behind humeral angles. Male genitalia of both forms are identical. In my opinion, *A. sumatrana* represents only a geographic form of *A. indica* on the southern border of its range and should be synonymized with *A. indica*.

***Aspidomorpha* (s. str.) *inquinata* BOHEMAN, 1854**

(figs 279-287, 304, 305, tab. 8: 1)

Aspidomorpha inquinata BOHEMAN, 1854: 309, 1856: 114; 1862: 277; GEMMINGER and HAROLD, 1876: 3649; SPAETH, 1914 c: 545, 1914 e: 68; MAULIK, 1916: 584 (probably misidentification); 1919: 328; BOROWIEC, 1990 a: 685; KIMOTO et al., 1995: 105 (incl. photo); HAITLINGER, 1996: 983 (parasite); KIMOTO, 1998 a: 27 (incl. colour photo).

Aspidomorpha (*Aspidomorpha*) *inquinata*: BOROWIEC, 1999: 188.

DIAGNOSIS

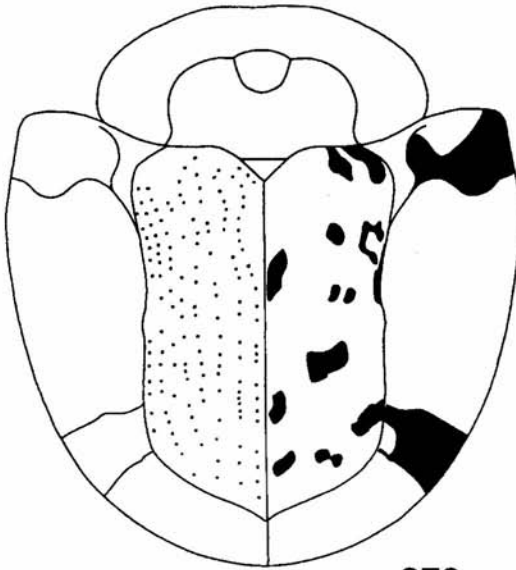
A member of *A. dorsata* group. *A. inquinata* and *A. musta* are the only members of the group with distinct dark spots on elytra. *A. musta* differs in smaller body and less maculate elytra. Elytral pattern of *A. inquinata* also is similar to that of *A. malaccana* from *A. sanctaerucis* group, but *A. malaccana* differs in lack of mandibular teeth. *A. inquinata* differs from other species of *A. dorsata* group that are similar size and have both spots on marginalia, in the characteristic pattern of elytral disc with numerous dark spots. *A. inquinata* and *A. musta* are probably vicariant species, the first is distributed only in the insular part of the Oriental Region (Java, Bali, Lombok), the second in the continental part of the region from NE India to Malay Pen. (including Andamanes).

DESCRIPTION

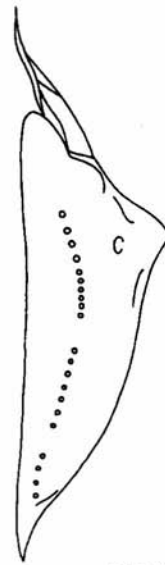
Male: L = 9.5-9.8; W = 8.4-8.8; Lp = 2.8-2.9; Wp = 5.5-5.7; L/W = 1.09-1.13; Wp/Lp = 1.89-1.96; Female: L = 9.4-10.6; W = 8.2-9.5; Lp = 3.0-3.1; Wp = 5.6-6.1; L/W = 1.09-1.14; Wp/Lp = 1.87-1.97. Body slightly trapezoidal or broadly-oval (fig. 279). Sexual dimorphism barely marked.

Pronotum and scutellum yellow. Disc of elytra yellow with a constant black pattern of three spots on interval 2 in 1/3, 2/3 and 4/5 length of disc, spot on interval 4 at basal margin of elytra, spot on interval 4 in principal impressions, spot on intervals 4-5 in 3/5 length of disc, spot on interval 4 in 4/5 length of disc, spot on humeral callus and spot on intervals 7, 8, and spot on interval 9 at base of posterolateral spots on explanate margin of elytra (figs 285, 286). Spots on interval 2 often connected together and form a spot on posterior part of postscutellar tubercle, sometimes also a spot on interval 4 in 4/5 length of disc extends to intervals 5 and 6. In the darkest forms, the spot on humeral callus extends from

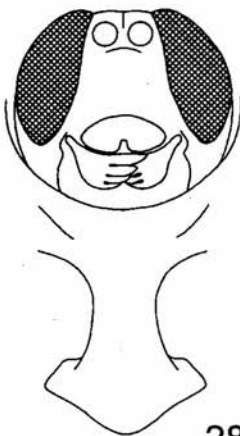
basal margin of elytra to $\frac{2}{5}$ length of disc. Explanate margin of elytra usually with black or brown humeral spots, with yellow window at basal margin of marginalia and posterolateral spots extending to the extreme margin of elytra. Sometimes these spots are invisible on dorsal part of explanate margin, but are distinct on its ventral part. Ventrites and legs yellow. Antennae yellow, last two segments black, sometimes segment 9 infusate.



279



280



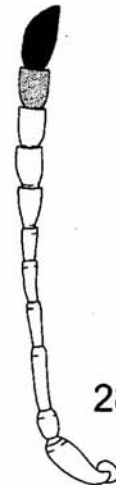
281



282



283

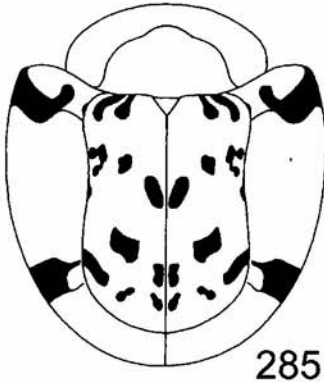


284

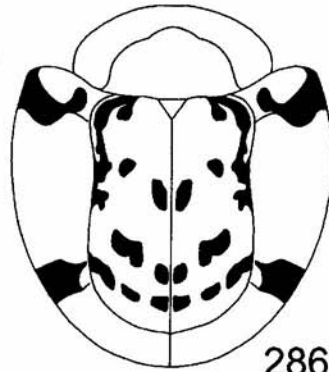
279-284. *Aspidimorpha inquinata*: 279 - body in dorsal view, 280 - body in lateral view, 281 - head and prosternum, 282 - inner side of claw, 283 - outer side of claw, 284 - antenna

Pronotum elliptical, 1.87-1.97 times wider than long, with maximum width in 1/2 basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

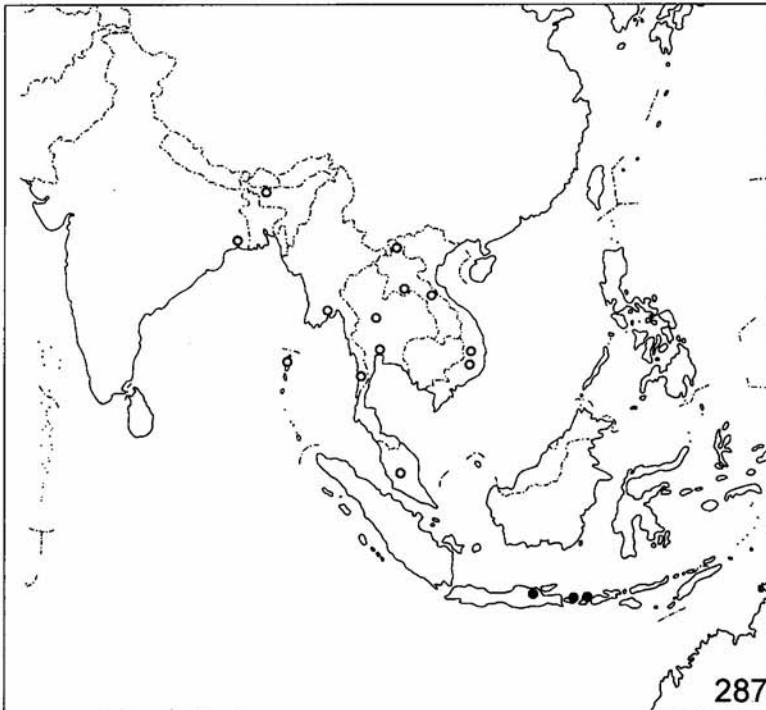
Base of elytra distinctly wider than base of pronotum. Humeral angles slightly protruding anterad, and meet at almost right angle. Disc convex, with large, conical postscutellar tubercle (fig. 280), and distinct principal impressions, with-



285



286



287

285-286. *Aspidimorpha inquinata*: variation of dorsal pattern; 287. Distribution of *Aspidimorpha inquinata* (black circles) and *Aspidimorpha musta* (white circles)

out postscutellar and lateral impressions. Puncturation moderately coarse, distinct along the whole length of disc, regular. Intervals equal in width, approximately five times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with sparse, long, erect hairs, often broken off in dried specimens.

Clypeus 1.7 times wider than long, slightly convex, with more or less distinct elongate impression. Labrum broad, emarginate to half length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 281).

Length ratio of antennal segments: 100: 37: 87: 62: 59: 44: 53: 53: 53: 53: 97, segment 3 approximately 2.4 times longer than segment 2, and approximately 1.4 times longer than segment 4 (fig. 284).

Claws with distinct pecten on both sides. Inner pecten with four teeth extending to 2/5-1/2 length of claw (fig. 282), last tooth shorter, extending to half length of first tooth. Outer pecten with three teeth extending to 1/3 length of claw (fig. 283).

Aedeagus slim, almost parallel-sided, apex broadly rounded with broad and obtuse apical process. Apical part distinctly curved ventrad. Ventral side without membrane (figs 304, 305).

TYPE MATERIAL

Lectotype "Java" "Type" (NRS) – designated by BOROWIEC (1999); 2 paralectotypes "29299" "Java Hffm" "inquinata Hoffm. Bhn. Java" (ZMHU).

DISTRIBUTION

Indonesia: Bali, Java, Lombok. Records from continental Asia concern *A. musta* (fig. 287)

Aspidimorpha (s. str.) *intermedia* n. sp.

(figs 288-293, 306-307, tab. 8: 8)

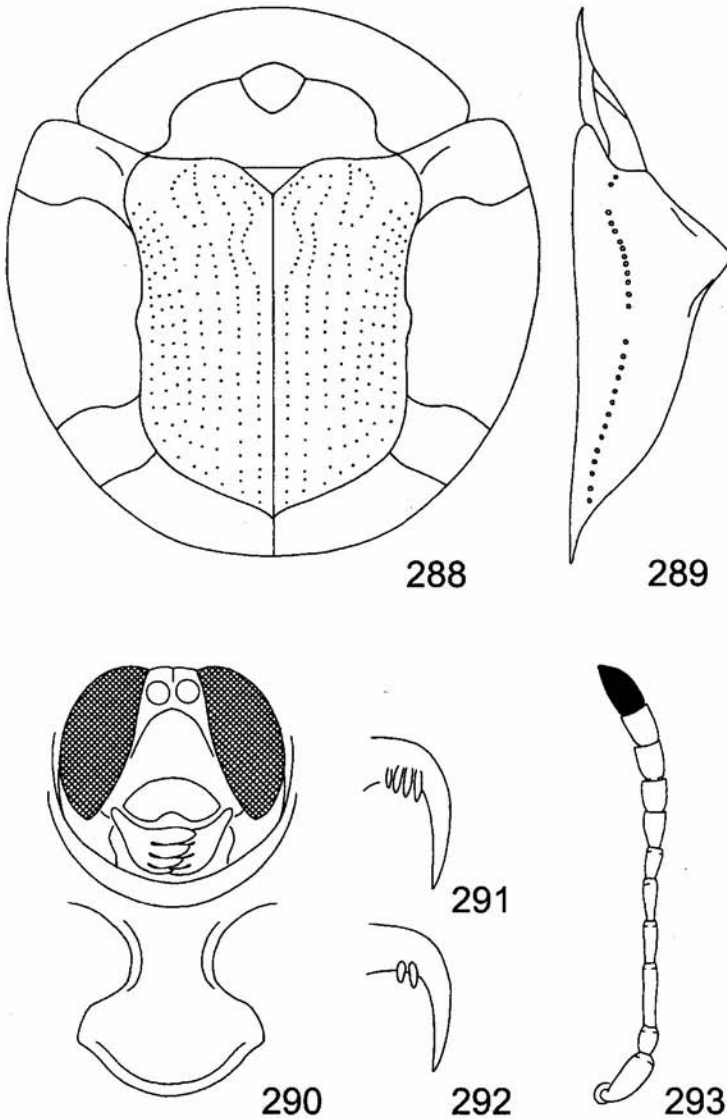
ETYMOLOGY

Named after its intermediate position between *A. castaneipennis* and *A. subcruciata*.

DIAGNOSIS

A member of *A. dorsata* group, but similar in body shape and broad humeral and posterolateral spots on explanate margin of elytra to *A. castaneipennis* from *A. sanctaerucis* group. However, *A. castaneipennis* is distinctly larger than *A. intermedia* and has mandibles without teeth. Similar to *A. intermedia* are also members of *A. dorsata* group: *A. subcruciata* from Philippines, *A. suavis* from Borneo, and *A. pacalis* from Tenimber. *A. suavis* differs in distinct brownish pattern on elytral disc, while elytral disc of *A. intermedia* is uniformly yellow or with barely marked yellowish-red pattern. *A. pacalis* is smaller, with body length

below 10.5 mm (above 10.6 in *A. intermedia*), slimmer elytra, strongly convergent posteriorly, and distinct humeral angles. The most similar is *A. subcruciata*, but differs in much smaller body (length below 10.5 mm), and uniformly yellow antennae (in *A. intermedia* one or two last segments are infuscate). In *A. intermedia* the spots on explanate margin of elytra are darker than, while those in *A. subcruciata* are of the same colour as elytral disc.



288-293. *Aspidimorpha intermedia*: 288 - body in dorsal view, 289 - body in lateral view, 290 - head and prothorax, 291 - inner side of claw, 292 - outer side of claw, 293 - antenna

DESCRIPTION

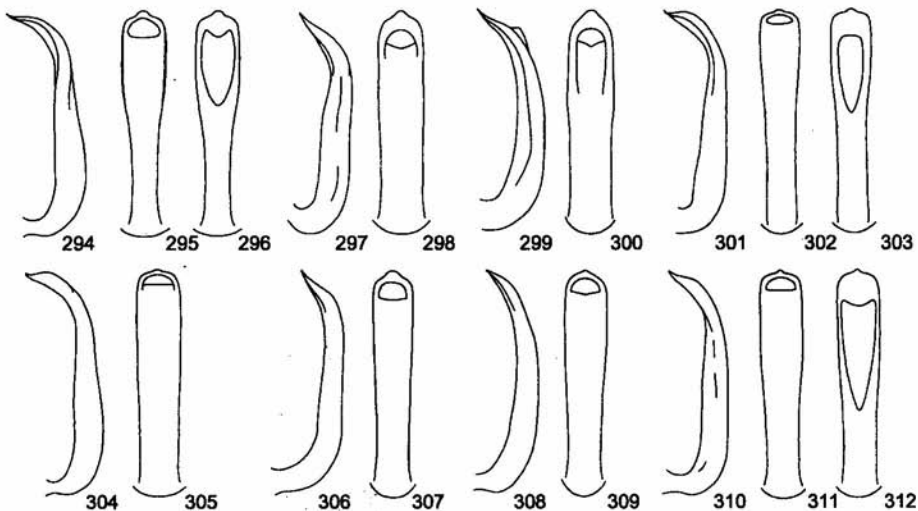
L = 10.7-10.8; W = 10.2-10.6; Lp = 3.2-3.7; Wp = 6.8-7.6; L/W = 1.01-1.05; Wp/Lp = 1.94-2.28. Body almost circular (fig. 288). Sexual dimorphism barely marked.

Pronotum and scutellum yellow to yellowish-brown. Disc of elytra uniformly yellow, yellowish-black to reddish-brown, or with lighter spots near postscutellar tubercle and on sides. Explanate margin of elytra with yellowish-brown or reddish-brown humeral and posterolateral spots with indistinct borders. Humeral spots usually slightly hammer-shaped. Ventriles and legs yellow. Antennae yellow, usually last segment black, sometimes two last segments black, and segment 9 mostly infusate.

Pronotum elliptical, with maximum width in 2/5 basal length, 1.94-2.28 times wider than long, with sides narrowly rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra distinctly wider than base of pronotum. Humeral angles rounded, slightly protruding anterad. Disc convex, with large, conical postscutellar tubercle (fig. 289), and barely marked principal impressions, without postscutellar and lateral impressions. Puncturation moderately coarse to fine, especially in posterior part of disc, distinct along the whole length of disc, regular. Intervals equal in width, approximately five times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with long, sparse hairs.

Clypeus 1.5 times wider than long, slightly convex. Labrum broad, emarginate to 1/4-1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, wide, without impression (fig. 290).



294-312. Aedeagi: 294-296 - *Aspidimorpha fuscopunctata*; 297, 298 - *A. indica*; 299, 300 - *A. inuncta*; 301-303 - *A. limbata*; 304, 305 - *A. inquinata*; 306, 307 - *A. intermedia*; 308, 309 - *A. lobata*; 310-312 - *A. limbipennis* 294, 297, 299, 301, 304, 306, 308, 310 - lateral; 295, 298, 300, 302, 305, 307, 309, 311 - dorsal; 296, 303, 312 - ventral

Length ratio of antennal segments: 100: 43: 103: 71: 71: 50: 57: 50: 53: 57: 96, segment 3 approximately 2.4 times longer than segment 2 and approximately 1.5 times longer than segment 4 (fig. 293).

Claws with short pecten on both sides. Inner pecten with four teeth extending only to 1/4 length of claw (fig. 291), outer pecten with two teeth extending to 1/5 length of claw (fig. 292).

Aedeagus slim, slightly widened apically, apex broadly rounded with obtuse apical process. Apical part gently curved ventrad. Ventral side without membrane (figs 306, 307).

TYPE MATERIAL

Holotype: "Philippines, N Luzon, Cap Engano" (LB); paratype: "Philippines N Luzon, Mallalan, I 1917" (LB); paratype: "Philippines, Palawan, Mantalingajan, 6 IX 1991" (LB).

DISTRIBUTION

Philippines: Luzon, Palawan.

Aspidimorpha (s. str.) *inuncta* BOHEMAN, 1854

(figs 299-300, 313-319, tab. 5: 7, 8)

Aspidomorpha inuncta BOHEMAN, 1854: 301; 1856: 113; 1862: 270; GEMMINGER and HAROLD, 1876: 3649; SPAETH, 1914 c: 543, 1914 e: 68; MAULIK, 1919: 327; BOROWIEC, 1990 a: 685.

Aspidomorpha inuncta: BOROWIEC, 1996: 10.

Aspidomorpha (*Aspidomorpha*) *inuncta*: BOROWIEC, 1999: 189.

Aspidomorpha spaethi MAULIK, 1918: 324; 1919: 328; TAKIZAWA, 1980a: 23 (larva, pupa); 1985 a: 5; BOROWIEC, 1999: 189 (as syn.).

DIAGNOSIS

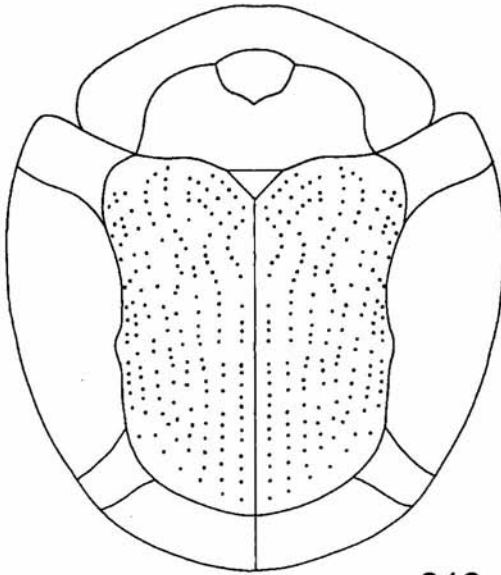
A member of *A. sanctaecrucis* group. The smallest and one of two slimmest species of the group, only the smallest specimens of *A. bataviana* are as small as the largest specimens of *A. inuncta* and only *A. birmanica* has L/W usually above 1.15. *A. inuncta* is smaller than *A. birmanica*, with body length below 11 mm (*A. birmanica* is always above 11 mm), and has distinctly shorter antennae, with third segment less (in *A. birmanica* always more) than two times longer than second segment. Surface of elytral disc of *A. inuncta* is very regular, and ground colour of elytra is yellowish-green, also in dried specimens (it is yellowish-red in *A. birmanica*). The two species are allopatric, *A. birmanica* is known only from Burma and Nepal, while *A. inuncta* from southern India. *A. inuncta* differs from *A. bataviana* in distinctly slimmer body and yellowish-green ground colour of elytra. *A. inuncta* and *A. bataviana* are allopatric, *A. bataviana* is known only from Java, Bali, and Borneo.

DESCRIPTION

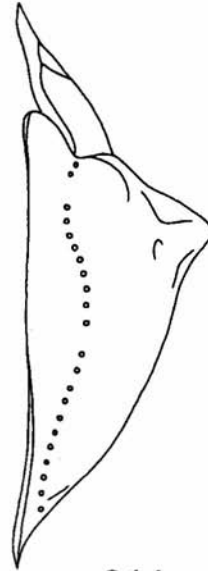
Male: L = 8.0-10.3; W = 6.9-8.6; Lp = 2.7-3.3; Wp = 5.1-6.5; L/W = 1.16-1.20; Wp/Lp = 1.80-1.97; Female: L = 8.6-11.2; W = 7.0-9.1; Lp = 2.9-3.6; Wp =

5.5-7.2; L/W = 1.21-1.25; Wp/Lp = 1.84-2.00. Body broad, oval (fig. 313), sexual dimorphism distinct, male usually smaller and stouter than female.

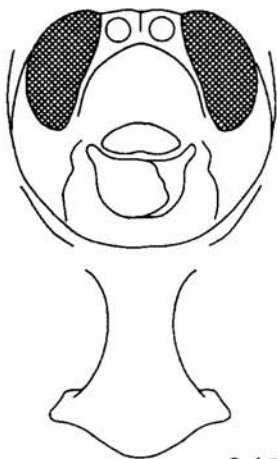
Pronotum and scutellum greenish-yellow, yellow, rarely yellowish-brown. Disc of elytra uniformly greenish-yellow, yellow, rarely yellowish-brown. Explanate margin of elytra with yellow to yellowish-brown humeral and posterolateral spots,



313



314



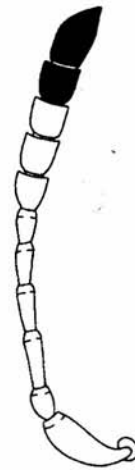
315



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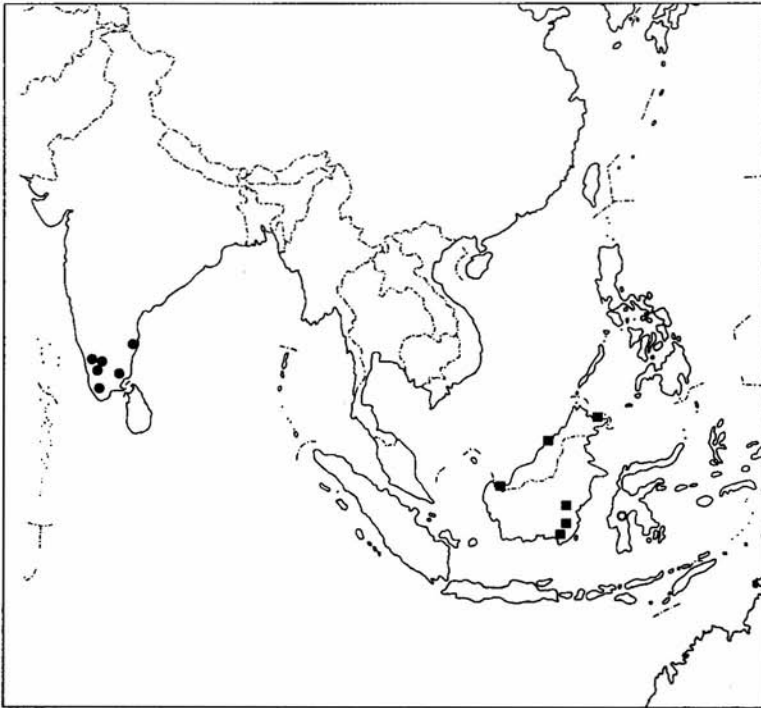
313-318. *Aspidimorpha inuncta*: 313 - body in dorsal view, 314 - body in lateral view, 315 - head and prosternum, 316 - inner side of claw, 317 - outer side of claw, 318 - antenna

rarely spots on explanate margin black. Ventrites and legs yellow. Antennae yellow, usually two last segments black, rarely penultimate segment only partly infuscate.

Pronotum elliptical, 1.8-2 times wider than long, with maximum width in 2/5 basal length, sides narrowly rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra wider than base of pronotum. Humeral angles slightly protrude anterad, and meet at almost right angle. Disc of elytra strongly convex, with large, conical postscutellar tubercle (fig. 314), shallow postscutellar impressions and distinct principal impressions, with absent or barely marked lateral impressions. Punctuation regular, moderately coarse, distinct along the whole length of disc. Punctures in rows tend to be grouped by 3-7 together. Sometimes in anterior part of second interval, there are additional, scattered punctures close to postscutellar impressions. Intervals mostly equal in width, approximately five times wider than punctures. Surface of intervals glabrous. Surface of disc slightly dull, appears slightly irregular, but without distinct folds or wrinkles. Apex of elytral epipleura with hairs.

Clypeus 1.8 times wider than long, flat or slightly impressed. Labrum broad, shallowly emarginate to 1/5 length. Mandibles with only cutting edge, without teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 315).



319. Distribution of *Aspdimorpha inuncta* (black circles), *A. sarasinorum* (white circle) and *A. suavis* (black squares)

Length ratio of antennal segments: 100: 37: 68: 58: 50: 39: 39: 42: 37: 42: 81, segment 3 approximately 1.8 times longer than segment 2 and approximately 1.2 times than segment 4 (fig. 318).

Claws with pecten on both sides. Inner pecten with four teeth extending to 1/2 length of claw, last tooth is the shortest (fig. 316). Outer pecten with three teeth extending to 1/3 length of claw (fig. 317).

Aedeagus slim, slightly widened in middle and apically, apex broadly rounded, with broad and obtuse apical process. Apical part regularly curved ventrad. Ventral side without membrane (figs 299, 300).

HOST PLANTS

Convolvulaceae: Ipomoea sp. (TAKIZAWA 1980); *Argyreia nervosa* (TAKIZAWA 1985 a).

TYPE MATERIAL

Aspidomorpha inuncta: holotype: "Malab." "Reiche" (NRS).

Aspidomorpha spaethi: holotype: "Nilgiri Hills" "Type" "acuta m." "type" "spaethi S. Maulik, type" "Andrewes B.M. 1922-221" (BMNH); paratype: "Nilgiri Hills, H.L. Andrewes 1.09 2000 ft." "cotype" "Asp. spaethi Maulik cotype" (BMNH).

DISTRIBUTION

S India: Kerala, Tamil Nadu (fig. 319).

Aspidomorpha (s. str.) *limbata* (GOLDFUSS, 1805)

(figs 35, 301-303, 320-325, tab. 8: 5, 6)

Cassida limbata GOLDFUSS, 1805: 41; SCHÖNHERR, 1817: 221.

Aspidomorpha limbata: BOHEMAN, 1854: 295, 1856: 112, 1862: 270; GEMMINGER and HAROLD, 1876: 3649; SPAETH, 1914 c: 543; 1914 e: 68, 1926 c: 118; BOROWIEC, 1990 a: 685.

Aspidomorpha (Aspidomorpha) limbata: BOROWIEC, 1999: 190.

Aspidomorpha elevata: BLANCHARD, 1853: 317, not FABRICIUS, 1801: 399.

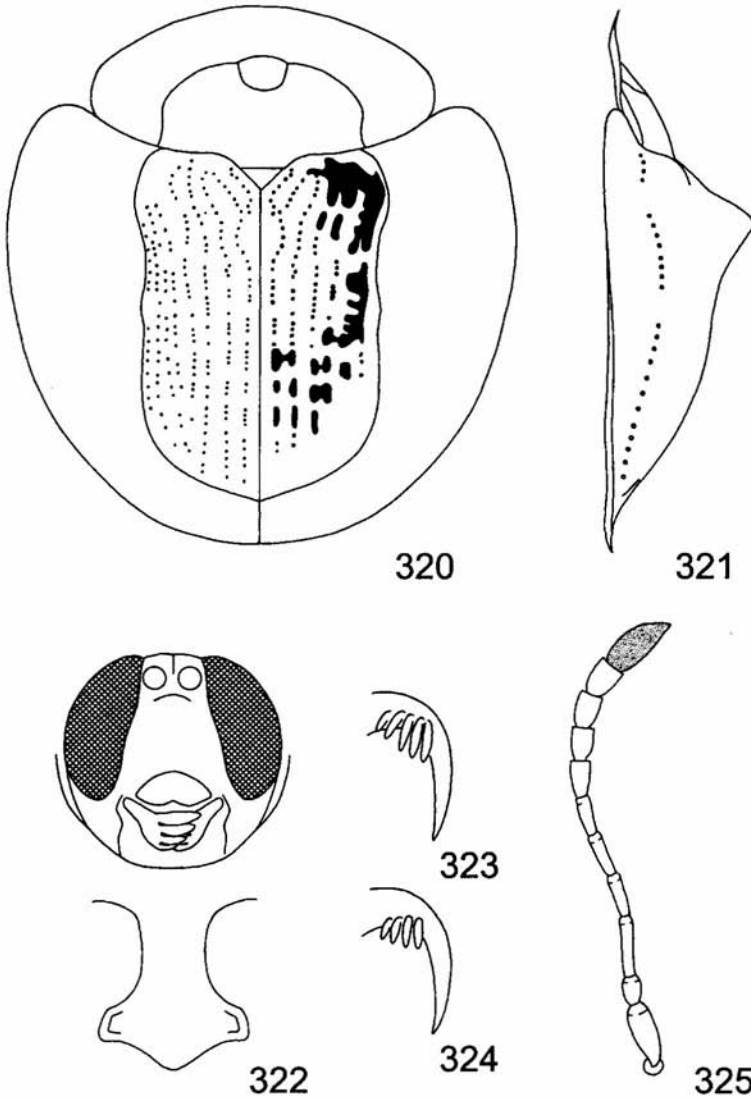
DIAGNOSIS

A member of *A. dorsata* group. Similar to *A. biradiata* in having slim body and dark elytral pattern. *A. limbata* differs in explanate margin of elytra always without spots, whereas explanate margin of *A. biradiata* always has humeral spots and often smaller or larger posterolateral spots. *A. sulawesica*, *A. timorensis* and pale forms of *A. fuscopunctata* also have explanate margin without spots, but differ in elytral disc without distinct black pattern, only *A. sulawesica* has small black spots at the top of postscutellar tubercle and behind humeral callus. *A. sulawesica* distinctly differs in very short inner pecten of claws extending at most to 1/5 length of claw, while in *A. limbata* inner pecten extends to 1/3 length of claw. *A. timorensis* differs also in smaller body length and acuminate humeral angles. *A. fuscopunctata* is stouter than *A. limbata* and has longer inner pecten of claws, extending to 2/3 length of claw.

DESCRIPTION

L = 10.1-11.7; W = 8.8-10.5; Lp = 2.4-3.5; Wp = 5.7-6.8; L/W = 1.07-1.15; Wp/Lp = 1.94-2.37. Body broad-oval to almost circular (fig. 320), sexual dimorphism indistinct.

Pronotum and scutellum yellow. In the palest forms disc of elytra yellow, with dark brown or black elongate spot along each side of disc extending from basal margin of elytra to 1/2-2/3 length of disc and with punctures marked with dark areola at least



320-325. *Aspidimorpha limbata*: 320 - body in dorsal view, 321 - body in lateral view, 322 - head and prosternum, 323 - inner side of claw, 324 - outer side of claw, 325 - antenna

on top of disc. In more frequent, darker forms almost whole disc black, except for yellow elongate spot along each side and around posterior border of disc and yellow spot on postscutellar tubercle, often connected with ragged elongate yellow spot along suture. Explanate margin of elytra yellow, without spots (fig. 320). Ventrites and legs yellow. Antennae yellow, last segment infuscate to black.

Pronotum elliptical, 1.94-2.37 times wider than long, with maximum width in 2/5 basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra distinctly wider than base of pronotum. Humeral angles slightly protruding anterad, rounded. Disc convex, with large, conical postscutellar tubercle (fig. 321), with principal and very shallow lateral impressions, without postscutellar impressions. Puncturation moderately coarse, distinct along the whole length of disc, regular. Intervals equal in width, approximately five times wider than punctures. Surface of intervals glabrous. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with hairs.

Clypeus 1.4 times wider than long, slightly convex. Labrum broad, emarginate to 1/4 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 322).

Length ratio of antennal segments: 100: 43: 96: 70: 70: 60: 56: 50: 53: 53: 106, segment 3 approximately 2.2 times longer than segment 2 and approximately 1.4 times longer than segment 4 (fig. 325).

Claws with distinct pecten on both sides. Inner pecten with five teeth, the first two extending to 1/3 length of claw, and the last two being twice shorter than the first (fig. 323). Outer pecten with four teeth extending to 1/4 length of claw (fig. 324).

Aedeagus slim, widened apically, apex broadly rounded with broad and obtuse apical process. Apical part distinctly curved ventrad. Ventral side with longitudinally striated membrane (figs 301-303).

TYPE MATERIAL

Type lost.

DISTRIBUTION

Indonesia: Java, Sumatra, Salajar; Malaysia (fig. 35).

***Aspidomorpha* (s. str.) *limbipennis* BOHEMAN, 1854 bona sp.**

(figs 310-312, 326-331, tab. 7: 3)

Aspidomorpha limbipennis BOHEMAN, 1854: 285, 1856: 110, 1862: 266; GEMMINGER and HAROLD, 1876: 3649.

Aspidomorpha elevata ssp. *limbipennis*: SPAETH, 1914 c: 543.

Aspidomorpha sanctaecrucis var. *limbipennis*: SPAETH, 1914 e: 69.

Aspidomorpha (*Aspidomorpha*) *limbipennis*: BOROWIEC, 1999: 190.

DIAGNOSIS

A member of *A. sanctaecrucis* group. Most similar to *A. elevata*, especially in large size, very broad body, and very broad, immaculate explanate margin of elytra. However, *A. limbipennis* is distinctly larger, with body length always above 12.5 mm (in *A. elevata* only rare, extremely large specimens extend 13.0 mm, most specimens are below 12.5 mm) and elytra in both sexes wider than or at least as wide as long, while in *A. elevata* only male elytra are particularly broad. Inner pecten of claws extends at most to 2/5 length of claw in *A. limbipennis*, and beyond half length of claw in *A. elevata*. Distribution of *A. limbipennis* is poorly known: with certainty it occurs on Ceylon and I have examined a specimen from the Assam Province of India. Thus, *A. limbipennis* and *A. elevata* are probably allopatric, because the latter is known only from Thailand, Malay Pen. and Sunda Is.

DESCRIPTION

L = 12.5-15.0; W = 13.0-14.5; Lp = 3.5-4.5; Wp = 8.3-9.9; L/W = 0.92-1.02; Wp/Lp = 2.04-2.67. Body extremely broad, in both sexes usually wider than long (fig. 326), sexual dimorphism barely marked.

Pronotum, scutellum, and disc of elytra yellowish-brown. Disc and explanate margin of elytra without spots. Ventrites and legs yellow. Antennae yellow, two last segments black.

Pronotum elliptical, 2.14-2.67 times wider than long, with maximum width in 1/2 basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra distinctly wider than base of pronotum. Humeral angles moderately protruding anterad, broadly rounded. Disc of elytra strongly convex, with large, conical postscutellar tubercle (fig. 327), distinct postscutellar impressions bordered by low elevation, and distinct principal impressions. Lateral impressions barely marked. Puncturation moderately coarse, sparse, in anterior part of disc denser than on slope. Scattered additional punctures sometimes present in anterior part of second or both second and fourth intervals. Punctures in rows tend to be grouped 2-6 together. Intervals mostly equal in width, three to four times wider than punctures. Surface of intervals glabrous and shiny. Surface of disc almost regular in comparison with related species, with only shallow, barely marked impressions. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with long hairs.

Clypeus 1.6 times wider than long, with distinct impression in apical part. Labrum broad, emarginate to 1/5 length. Mandibles with cutting edge, without teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 328).

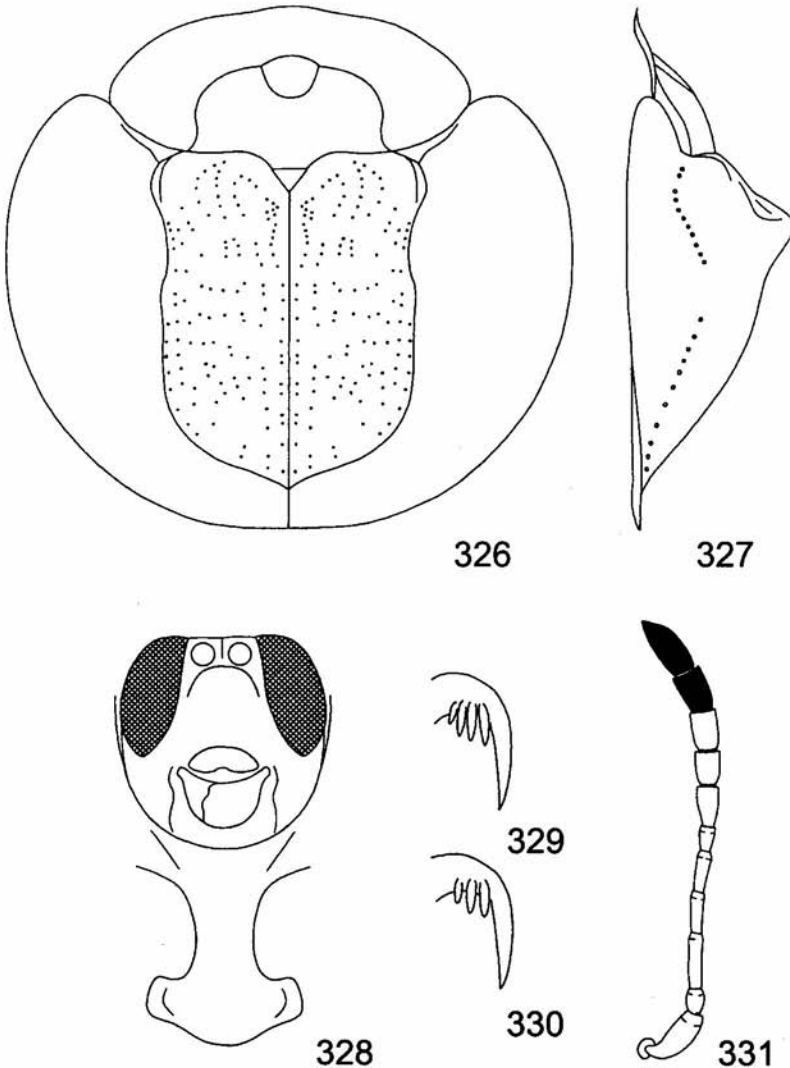
Length ratio of antennal segments: 100: 40: 93: 66: 66: 40: 63: 53: 63: 70: 113, segment 3 approximately 2.3 times longer than segment 2 and approximately 1.4 times than segment 4 (fig. 331).

Claws with distinct pecten on both sides. Inner pecten with four teeth extending to 2/5 length of claw, last tooth is shortest (fig. 329). Outer pecten with three almost equal teeth extending to 1/3 length of claw (fig. 330).

Aedeagus slim, slightly widened apically, apex broadly rounded, with small apical process. Apical part distinctly curved ventrad. Ventral side with elongate, longitudinally striated membrane, which extends to half length of aedeagus (figs 310-312).

TYPE MATERIAL

Lectotype: "Ceylon Nieth." "29287" "limbipennis Bhm" (ZMHU) – designated by BOROWIEC (1999).



326-331. *Aspidimorpha limbipennis*: 326 - body in dorsal view, 327 - body in lateral view, 328 - head and prosternum, 329 - inner side of claw, 330 - outer side of claw, 331 - antenna

DISTRIBUTION

Ceylon; India: Assam. I have examined an old specimen labelled "Java *elevata* F." but probably it was secondarily labelled by misidentification with *A. elevata*.

REMARKS

The species has hitherto been misinterpreted, although it distinctly differs from the other species of the *A. sanctaegrucis* group. SPAETH (1914 e), who was first to reduce it to a subspecies of *A. elevata*, in fact never studied any specimen of *A. limbipennis*. When analysing his unpublished key to the genus *Aspidimorpha* (housed in Manchester Museum) I realized that he confused very broad males of *A. elevata* with *A. limbipennis*.

***Aspidimorpha* (s. str.) *lobata* BOHEMAN, 1854 *bona* sp.**

(figs 308, 309, 332-338, tab. 5: 5)

Aspidimorpha lobata BOHEMAN, 1854: 289, 1856: 111, 1862: 268; GEMMINGER and HAROLD, 1876: 3649; DUVIVIER, 1891: 50; SPAETH, 1914 c: 544; BOROWIEC, 1990 a: 685 (as *bona* sp.); KIMOTO et al., 1995: 106 (in syn. of *sanctaegrucis*).

Aspidimorpha lobata: BOROWIEC, 1996: 10.

Aspidimorpha sanctaegrucis ssp. *lobata*: SPAETH, 1914 e: 70.

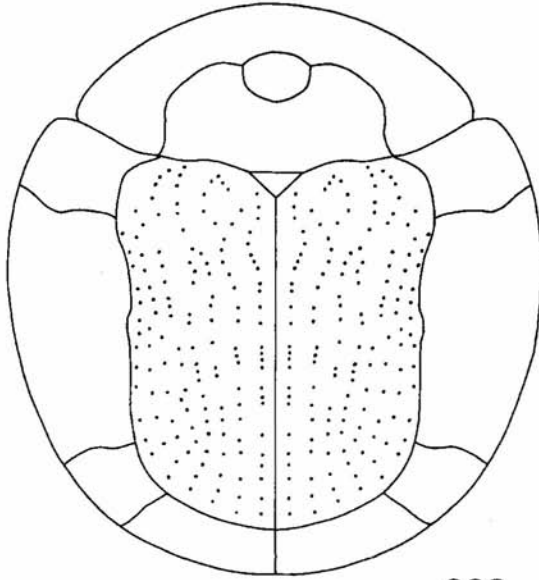
Aspidimorpha (*Aspidimorpha*) *lobata*: BOROWIEC, 1999: 191.

DIAGNOSIS

A member of *A. sanctaegrucis* group. At first glance similar to *A. sanctaegrucis* but differs in less broad body, with elytra less wide than base of pronotum, and surface of elytral disc without distinct wrinkles and impressions. The best distinguishing character is short inner pecten of claws, extending at most to 1/3 length of claw, while inner pecten of *A. sanctaegrucis* claws extends at least to 1/2-2/3 (occasionally in specimens from Assam to 2/5) length of claw. Aedeagus of *A. lobata* without longitudinally striated membrane on ventral side, which is characteristic of *A. sanctaegrucis*. *A. lobata* differs from *A. elevata* in slimmer body, darker elytral disc (reddish yellow, in *A. elevata* pale yellow), presence of both spots on explanate margin of elytra, and short pecten of claws. *A. birmanica* is also similar, but differs in slimmer body, and very long pectens of claws, extending at least to half length of claw; in *A. birmanica* surface of elytra is as irregular as in typical specimens of *A. sanctaegrucis*, while in *A. lobata* the surface is very regular, and only shallowly impressed. *A. innuncta* differs in distinctly smaller size and usually yellowish-green ground colour of elytral disc (reddish-yellow in *A. lobata*). *A. malaccana* differs in maculate elytral disc. *A. bataviana* differs in smaller size of body, and longer pecten on claws. *A. stevensi* differs in smaller body size, spots on explanate margin never hammer-shaped, surface of elytral disc completely regular, without impressions, and longer pecten of claws.

DESCRIPTION

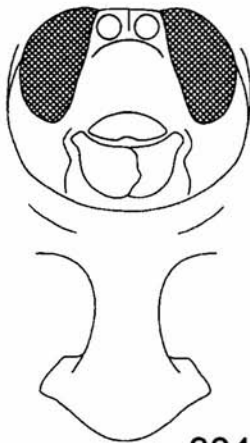
L = 10.8-13.4; W = 9.7-12.4; Lp = 3.6-4.3; Wp = 7.0-8.8; L/W = 1.01-1.15; Wp/Lp = 1.87-2.05. Body broadly-oval to almost circular (fig. 332), especially stout forms occur on Ceylon. Sexual dimorphism barely marked, male slightly stouter than female.



332



333



334



335



336



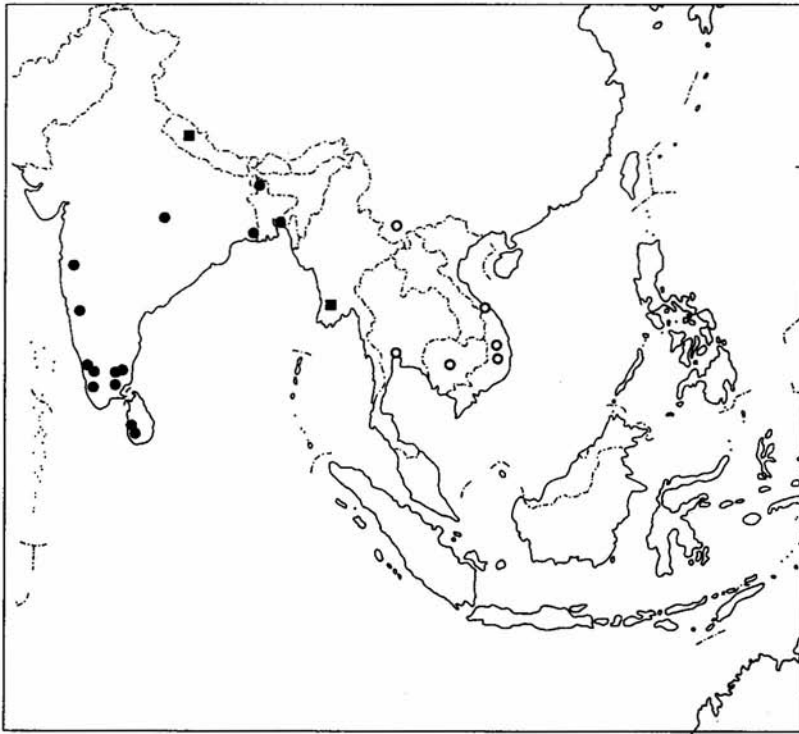
337

332-337. *Aspidimorpha lobata*: 332 - body in dorsal view, 333 - body in lateral view, 334 - head and prosternum, 335 - inner side of claw, 336 - outer side of claw, 337 - antenna

Pronotum and scutellum yellow to reddish-brown. Disc of elytra uniformly yellow-reddish to reddish-brown. Explanate margin of elytra with humeral and posterolateral spots. Humeral spots usually slightly hammer-shaped, but sometimes not widened apically. Ventrites yellow, sometimes yellowish-brown. Legs yellow. Antennae yellow, two last segments black.

Pronotum elliptical, 1.87-2.05 times wider than long, with maximum width in 2/5 basal length, sides narrowly rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra wider than base of pronotum, but usually less than in related species, only in populations from Ceylon base of elytra is distinctly wider than base of pronotum, almost as in *A. sanctaecrucis*. Humeral angles form an almost right angle. Disc of elytra strongly convex, with large, conical postscutellar tubercle (fig. 333), with postscutellar and principal impressions, and without lateral impressions. Postscutellar impressions bordered by distinct fold, also at basal margin of elytra. Puncturation regular, sparse, moderately coarse, distinct along the whole length of disc. Punctures in rows tend to be grouped by 2-7 together. Intervals mostly equal in width, approximately three times wider than punctures. Surface of intervals glabrous, slightly irregular, but distinctly less irregular than in related *A. sanctaecrucis* or *A. elevata*. Explanate margin of elytra



338. Distribution of *Aspidimorpha lobata* (black circles), *Aspidimorpha birmanica* (black squares) and *Aspidimorpha stevensi* (white circles)

glabrous. Apex of elytral epipleura in male with sparse and short, in female long and dense hairs.

Clypeus 1.5 times wider than long, shallowly impressed. Labrum broad, emarginate to 1/3-2/5 length. Mandibles with cutting edge, without teeth. Prosternal process rhomboidal, moderately wide, with fine impression in the middle (fig. 334).

Length ratio of antennal segments: 100: 34: 79: 55: 52: 45: 45: 42: 45: 45: 68, segment 3 approximately 2.3 times longer than segment 2 and approximately 1.4 times than segment 4 (fig. 337).

Claws with distinct pecten on both sides. Inner pecten with three equal teeth extending at most to 1/3 length of claw (fig. 335). Outer pecten with three equal teeth extending to 1/5 length of claw (fig. 336).

Aedeagus slim, slightly widened apically, apex broadly rounded, with blunt apical process. Apical part gently curved ventrad. Ventral side without membrane (figs 308, 309).

TYPE MATERIAL

Not found. Probably some specimens from BMNH identified as *A. sanctaecrucis* and labelled "Ind. or." are syntypes. In ZMHU there is also a specimen labelled "29316" "Jamaica Koll." and marked as a type, but its locality does not correspond with the terra typica from original description – India orientalis.

DISTRIBUTION

Bangladesh, Ceylon, and India (fig. 338).

REMARKS

KIMOTO et al. (1995) synonymized *A. lobata* with *A. sanctaecrucis*, but they never studied specimens of *A. lobata*. In their sense, *A. sanctaecrucis* comprises all taxa related to it (*A. elevata*, *insularis*, *limbipennis*, *lobata*, *stevensi*) and listed in SPAETH's (1914 e) catalogue mostly as subspecies of *A. sanctaecrucis*. In my opinion all these taxa (except "*insularis*" which is only a local form of *A. sanctaecrucis* from Borneo) represent a monophyletic group of related species distinguished by a complex of structural and geographical characters. *A. lobata* distinctly differs from sympatric *A. sanctaecrucis* in very short pecten of tarsal claws.

Aspidimorpha (s. str.) *luzonica* n. sp.

(figs 339-344, 354, 355, tab. 10: 8)

ETYMOLOGY

Named after its terratypica, Luzon of the Philippines Archipelago.

DIAGNOSIS

A member of *A. dorsata* group. *A. luzonica*, *A. bilobata*, and *A. dulcicula* have only humeral spots on elytral marginalia and short inner pecten of claws extending at most to 1/3 length of claw. They are mostly distributed on islands of

the Oriental Region, only *A. dulcicula* occurs also in southern Malay Pen. *A. dulcicula* differs from *A. luzonica* in dark pattern on elytral disc (at least spot at postscutellar tubercle and behind humeral calli); it has also more southern distribution, most records are from Borneo, Sumatra and southern Malay Pen., with only single record from Luzon of the Philippines, while *A. luzonica* is known only from Luzon and Palawan. The most similar to *A. luzonica* is *A. bilobata*, both in size and shape and uniform colour of elytral disc. *A. luzonica* differs in black last antennal segment, while antennae of *A. bilobata* are uniformly yellow. Humeral angles of *A. luzonica* are distinctly marked and margin of elytral marginalia behind humeral angles is slightly emarginate (in *A. lobata* extreme margin is not emarginate, and humeral angles are rounded). *A. biradiata*, form without posterolateral spots, is also similar but differs in brownish to black pattern of elytral disc, while in *A. luzonica* elytral disc is always without dark spots.

DESCRIPTION

Male: L = 9.5; W = 9.2; Lp = 2.8; Wp = 6.0; L/W = 1.03; Wp/Lp = 2.14; Female: L = 11.0; W = 10.5; Lp = 3.2; Wp = 7.3; L/W = 1.05; Wp/Lp = 2.28. Body almost circular (fig. 339), sexual dimorphism indistinct, male slightly smaller than female.

Pronotum and scutellum yellowish-brown. Disc of elytra yellowish-brown. Explanate margin of elytra with complete, yellowish-brown humeral spots. Ventrites and legs yellow. Antennae yellow, last segment black.

Pronotum elliptical, 2.14-2.28 times wider than long, with maximum width in 1/2 basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra distinctly wider than base of pronotum. Humeral angles slightly protruding anterad, form right angle, extreme margin behind humeral angles slightly emarginate. Disc of elytra convex with large conical postscutellar tubercle (fig. 340), barely marked principal impressions, and without postscutellar and lateral impressions. Puncturation fine, numerous and regular, on slope gradually finer to almost obsolete, behind humeral calli distinctly coarser than in central part of disc. Intervals mostly equal in width, approximately five to six times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with dense hairs.

Clypeus approximately 1.4 times wider than long, with fine row in the middle. Labrum broad, emarginate to 1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 341).

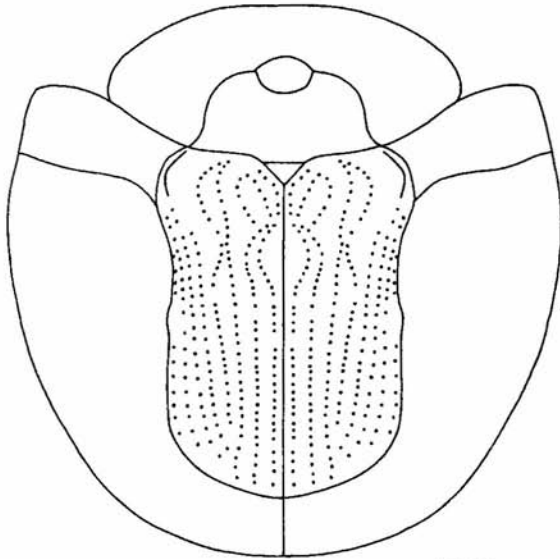
Length ratio of antennal segments: 100: 40: 100: 76: 66: 50: 63: 66: 66: 106, segment 3 approximately 2.5 times longer than segment 2 and approximately 1.3 times than segment 4 (fig. 344).

Claws with pecten on both sides. Inner pecten with three teeth, extending to 1/3 length of claw (fig. 342). Outer pecten with two teeth extending to 1/4 length of claw (fig. 343).

Aedeagus slim, slightly widened apically, apex broadly rounded, with moderately large and obtuse apical process. Apical part distinctly curved ventrad. Ventral side without membrane (fig. 354, 355).

TYPE MATERIAL

Holotype: "Philippines, Luzon, Baguio, Benguet" (LB); paratype: "Philippines, Luzon, Baguio" (LB); paratype: "Philippines, Palawan, Mantalingajan, 6 IX 1991" (LB).



339



340



341



342



343



344

339-344. *Aspidimorpha luzonica*: 339 - body in dorsal view, 340 - body in lateral view, 341 - head and prosternum, 342 - inner side of claw, 343 - outer side of claw, 344 - antenna

DISTRIBUTION

Philippines: Luzon, Palawan.

***Aspidomorpha (s. str.) malaccana* SPAETH, 1937**

(figs 345-353, 356-358, 372, tab. 6: 5, 6)

Aspidomorpha malaccana SPAETH, 1937 b: 137, 1938: 231; BOROWIEC, 1990 a: 686; KIMOTO, 1998: 28; MOHAMEDSAID, 2000 a: 359.

Aspidomorpha malaccana: BOROWIEC, 1996: 10.

Aspidomorpha (Aspidomorpha) malaccana: BOROWIEC, 1999: 191.

DIAGNOSIS

A member of *A. sanctaecrucis* group. Differs from all members of the group in well developed black pattern on elytral disc. Only in forms of *A. sanctaecrucis* from Borneo and in *A. ponderosa* elytral disc has black spots, but they are limited to spot on humeral callus and occasionally to elongate spot behind humeral callus. *A. ponderosa* also differs in short inner pecten of claws extending at most to 1/3 length of claw, whereas inner pectens of *A. malaccana* extend to half length of claw.

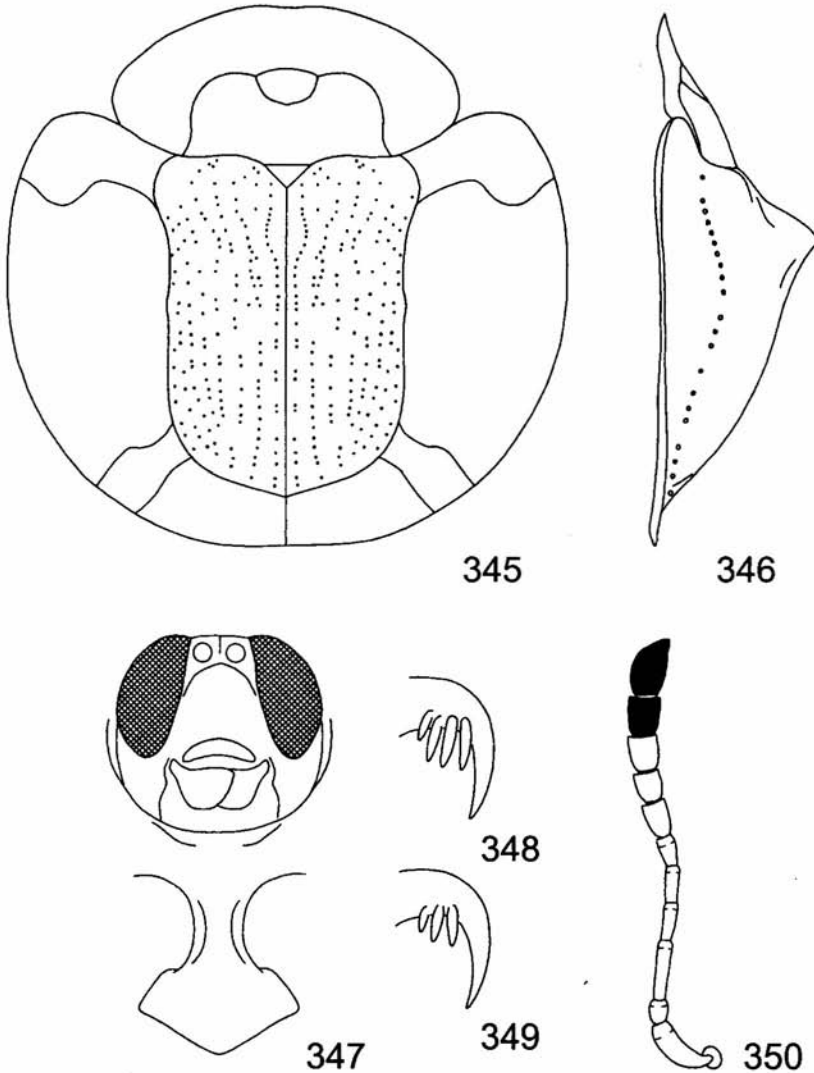
DESCRIPTION

Male: L = 8.9-10.6; W = 9.1-10.8; Lp = 2.9-3.5; Wp = 5.7-6.8; L/W = 0.94-1.00; Wp/Lp = 1.90-2.17; Female: L = 9.5-11.0; W = 9.5-10.8; Lp = 2.9-3.7; Wp = 6.2-6.9; L/W = 1.02-1.04; Wp/Lp = 1.86-2.24. Body circular (fig. 345), sexual dimorphism indistinct, male usually smaller and stouter than female.

Pronotum and scutellum yellow. In the palest forms disc of elytra yellow with punctures marked with yellowish-brown areola, especially on top of disc, in postscutellar area, on sides and in posterior part of disc. Explanate margin of the palest forms with yellowish-brown humeral spots, darker at base of the humeral spot and along anterior margin of marginalia, and usually without posterolateral spots (fig. 352). In darker forms areolae expand and coalesce, especially on sides and on the top of disc, and form one elongate spot on each side of disc and another spot in posterior part of postscutellar tubercle. Explanate margin of these forms with pale brown humeral and posterolateral spots, darker at base (fig. 353). In the darkest forms disc of elytra with spot in posterior part of postscutellar tubercle and elongate spot on each side of disc and in posterior part of disc. Explanate margin of the darkest forms with black humeral and posterolateral spots (fig. 351). Humeral spots usually with triangular, yellow window close to humeral angles. Occasionally disc of elytra completely yellow, and explanate margin with yellowish-brown humeral and posterolateral spots. Ventriles and legs yellow. Antennae yellow, usually two last segments black, sometimes penultimate segment only partly black.

Pronotum ellyptical, 1.86-2.24 times wider than long, with maximum width in 1/3 basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Base of elytra distinctly wider than base of pronotum. Humeral angles rounded. Disc of elytra convex, with large, conical postscutellar tubercle (fig. 346), with shallow postscutellar impressions bordered by low elevation, distinct principal impressions and shallow lateral impressions. Puncturation regular, moderately coarse, distinct along the whole length of disc, but punctures in rows tend to be grouped by 2-7 together. Anterior part of second and sometimes fourth interval



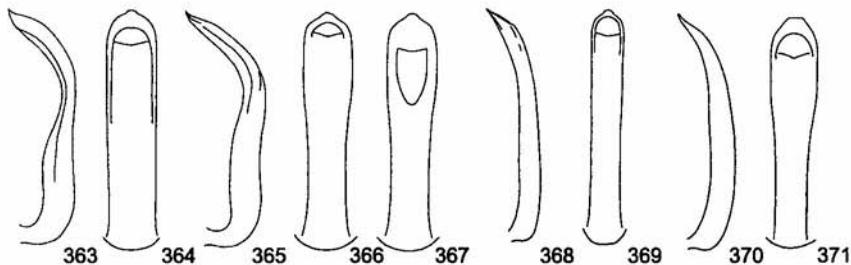
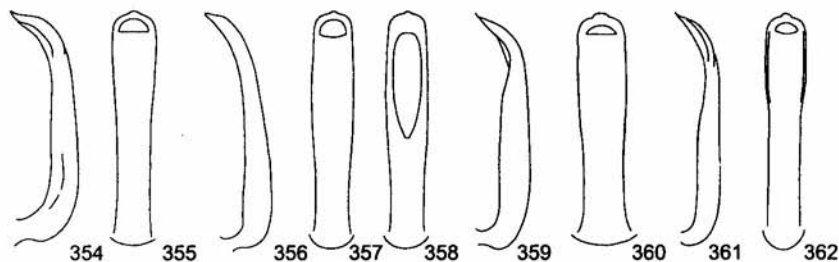
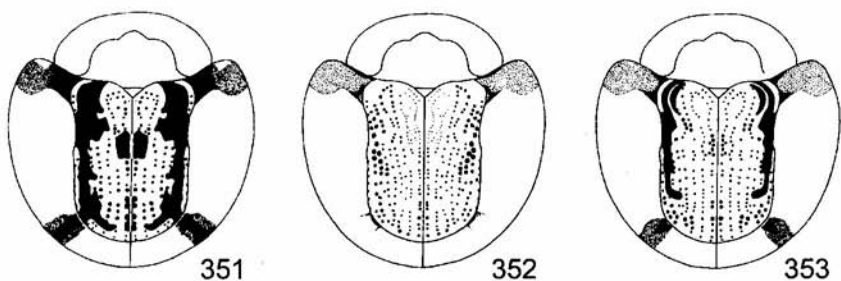
345-350. *Aspidimorpha malaccana*: 345 - body in dorsal view, 346 - body in lateral view, 347 - head and prothorax, 348 - inner side of claw, 349 - outer side of claw, 350 - antenna

usually with additional irregular punctures. Intervals mostly equal in width, approximately three times wider than rows. Surface of intervals glabrous. Surface of disc appears slightly irregular, partly wrinkled and with shallow impressions. Explanate margin of elytra glabrous. Apex of elytral epipleura with dense, erect hairs.

Clypeus 1.5 times wider than long, with impression in the middle. Labrum broad, shallowly emarginate. Mandibles with cutting edge, without teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 347).

Length ratio of antennal segments: 100: 36: 96: 60: 60: 46: 56: 46: 53: 60: 96, segment 3 approximately 2.7 times longer than segment 2 and approximately 1.6 times than segment 4 (fig. 350).

Claws with distinct pecten on both sides. Inner pecten with four teeth extending to 1/2 length of claw, last tooth slightly shorter than reminder teeth (fig. 348). Outer pecten with three teeth extending to 1/3 length of claw (fig. 349).



351-353. *Aspidimorpha malaccana*: variation of dorsal pattern; 354-371. Aedeagi: 354, 355 - *Aspidimorpha luzonica*; 356-358 - *A. malaccana*; 359, 360 - *A. snizeki*; 361, 362 - *A. chandrika*; 363, 364 - *A. miliaris*; 365-367 - *A. mutilata*; 368, 369 - *A. musta*; 370-371 - *A. sarasinorum*; 354, 356, 359, 361, 363, 365, 368, 370 - lateral; 355, 357, 360, 362, 364, 366, 369, 371 - dorsal; 358, 367 - ventral

Aedeagus slim, slightly widened apically, apex broadly rounded, with slightly marked apical process. Apical part gently curved ventrad. Ventral side with longitudinally striated membrane (figs 356-358).

TYPE MATERIAL

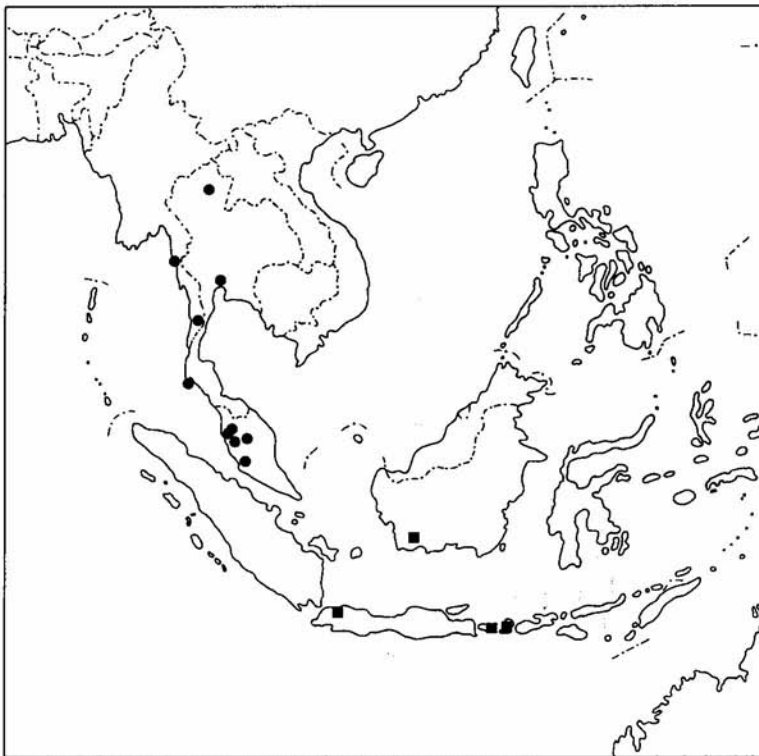
Syntype: "Fed. Malay States" "Balio Gajot Perek" "1925" "H. W. Simmonds" "*malaccana* n. sp. cotyp" (BMNH); syntype: "Salanga, paratyp" (MM); 2 syntypes: "Kwala-Kampsar, Perak, Grubauer 1902, (MM); syntype: "Taiping, Perak, Fed. Malay States, V-16 1924, H. Abraham (MM); syntype: "Kuala Tahan, Pahang, Nov. 1921, F.N.Chasen coll. (MM); syntype: "Mus. Leyden, P. J. v. does de Bye, Typus" (MM); syntype: "Khao Ram, Siam, Feb. 25-1922, paratyp" (MM).

DISTRIBUTION

Burma: Tenasserim; Thailand; Malaysia (fig. 372).

REMARKS

KIMOTO (1998b) suggested that *A. malaccana* is close to *A. inquinata*, but he never studied any specimens of *A. malaccana* (which was not included in his key



372. Distribution of *Aspidimorpha malaccana* (black circles) and *A. bataviana* (black squares)

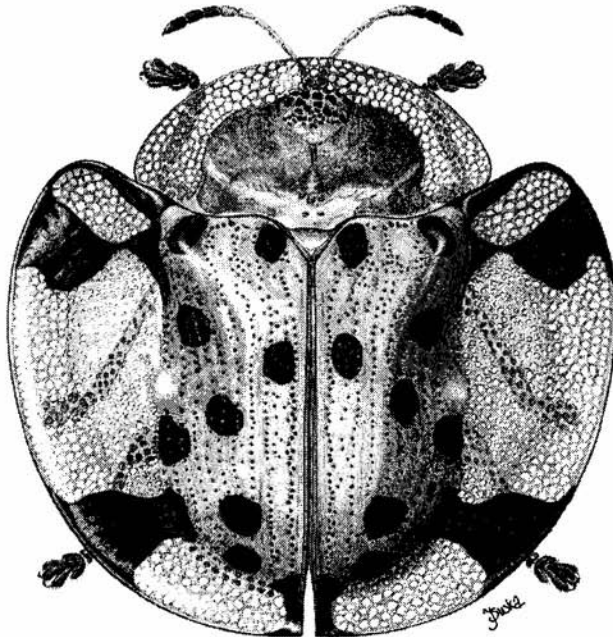
to *Aspidomorpha* of SE Asia). Some specimens of *A. malaccana* and *A. inquinata* are indeed similar in their elytral pattern, but *A. inquinata* has the mandibles with teeth and belongs to the *A. dorsata* group, while *A. malaccana*, like other species of the *A. sanctaecrucis* group, has mandibles untoothed, only with a cutting edge.

***Aspidomorpha* (s. str.) *miliaris* (FABRICIUS, 1775)**

(figs 363, 364, 373-394, tab. 1: 2, 2: 1-3, 4: 1-6)

Cassida miliaris FABRICIUS, 1775: 91, 1781: 111, 1787: 64, 1792: 300, 1801: 400; GOEZE, 1777: 211; GMELIN, 1787: 1640; OLIVIER, 1790: 385, 1808: 943 (incl. fig.); HERBST, 1799: 312; SCHÖNHERR, 1817: 222; ZIMSEN, 1964: 91; BASILEVSKY, 1972: 247.

Aspidomorpha miliaris: BOHEMAN, 1854: 26 1, 1856: 106, 1862: 259; BALY, 1863: 13; GEMMINGER and HAROLD, 1876: 3650; WOLLASTON, 1877: 215; DUVIVIER, 1881: 49; WEISE, 1892 c: 385; 1896: 16, 1897: 102; 1901: 52; SPAETH, 1900: 23, 1903 a: 138, 1912: 116, 1914 e: 69, 1926 c: 117, 1932 c: 135, 1938: 231; SCHULTZE, 1908: 264 (biology); MAULIK, 1916: 584; 1919: 270 (incl. larva, pupa, fig.), 334; GRESSITT, 1938 a: 189; 1938 c: 579; 1939: 140; 1952: 465 (incl. fig., pupa); HINCKS, 1953: 69; CHEN and ZIA, 1961: 441; GRESSITT and KIMOTO, 1963: 952 (incl. fig., pupa); TAKIZAWA, 1980 a: 28 (larva, pupa); 1985 a: 5; 1987: 526; MEDVEDEV and DAN, 1982: 95; MEDVEDEV and EROSHKINA, 1982: 104, 105; 1988: 123; LIZHONG, 1982: 53; 1989: 86; YU, 1983: 795, 1986: 682; ZAITSEV and MEDVEDEV, 1983: 140 (larva); BOROWIEC, 1985: 26; 1990 a: 686; CHEN et al., 1986: 584, 636, pl. XIV (incl. colour fig.); BASU and HALDER, 1987: 237;



373. *Aspidomorpha miliaris*, dorsal view

- KIMOTO, 1991: 26, 1998: 28 (incl. colour photo); MOHAMEDSAID, 1993: 44 (colour photo), 1994: 370, 2000 a: 359, 2000 b: 375; MEDVEDEV, 1995: 20, 1997: 265; KIMOTO et al., 1995: 105 (incl. photo); KIMOTO and CHU, 1996: 133; RAMESH, 1996: 140-142; REID, 1997: 39; MEDVEDEV and SPRECHER-UEBERSAX, 1999: 348.
- Aspidomorpha* [sic] *miliaris*: WEISE, 1910 a: 143.
- Aspidomorpha miliaris*: BOROWIEC, 1992: 148 (incl. fig.), 1996: 11.
- Aspidomorpha miiialis* [sic]: KIMOTO, 1981: 57.
- Aspidomorpha (Aspidomorpha) miliaris*: BOROWIEC, 1999: 192.
- Aspidomorpha miliaris* ab. *flaveola* WEISE, 1910: 143; SPAETH, 1914 e: 69.
- Aspidomorpha miliaris* ab. *inundata* WEISE, 1910: 143; SPAETH, 1914 e: 69.
- Cassida quatuordecim-punctata* OLIVIER, 1808: 943; BOHEMAN, 1856: 204, 1862: 487; GEMMINGER and HAROLD, 1876: 3650; SPAETH, 1914 e: 69 (as syn. of *miliaris*).
- Aspidomorpha celebensis* BLANCHARD, 1853: 316; BOHEMAN, 1962: 281; GEMMINGER and HAROLD, 1876: 3648; WEISE, 1896 c: 16 (as syn. of *amplissima*).
- Aspidomorpha celenbensis* [sic!]: KIMOTO, 1998: 29.
- Aspidomorpha amplissima* BOHEMAN, 1854: 260, 1856: 106, 1862: 259; GEMMINGER and HAROLD, 1876: 3648; WEISE, 1896 c: 16 (as syn. of *miliaris*); WĘGRZYNOWICZ and WĄSOWSKA, 1996: 40.

DIAGNOSIS

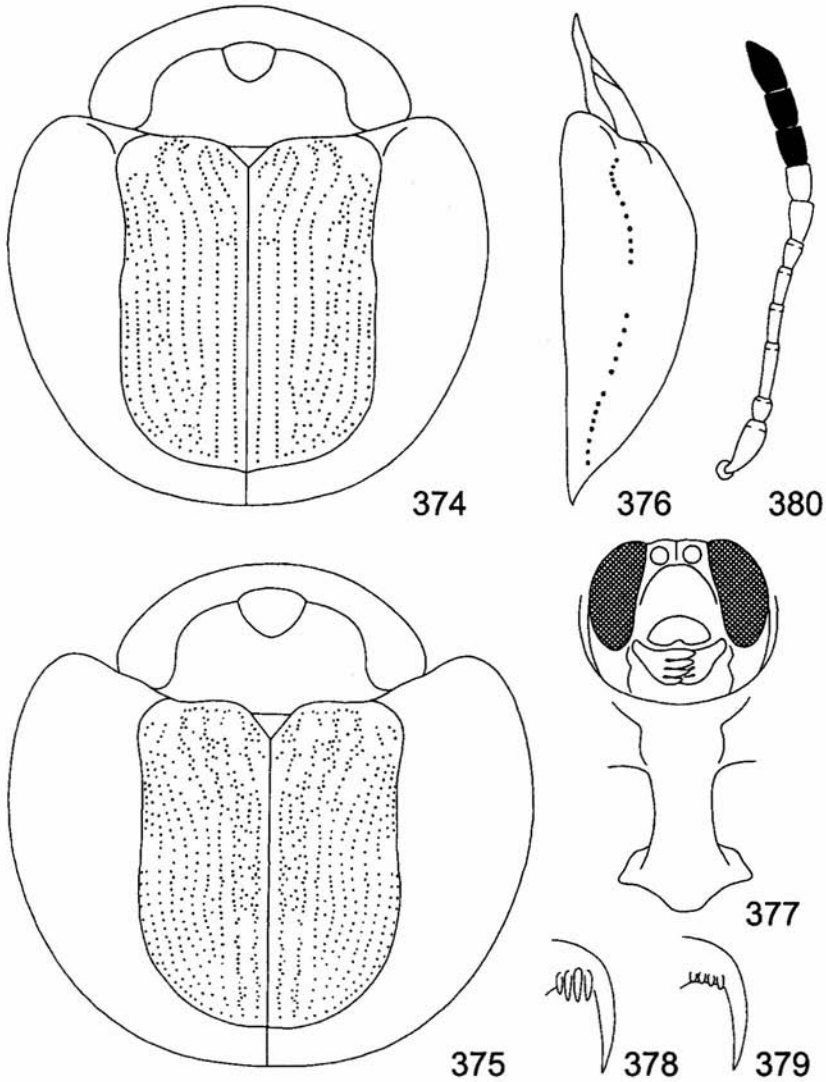
A. miliaris and *A. hexaspilota* form a group of species, which is characterized by moderate to large, circular body, and regularly convex elytral disc without postscutellar tubercle. Both species usually have black maculate elytral disc. *A. miliaris* differs from *A. hexaspilota* in larger size ($L = 9.7-15.7$ mm, in *A. hexaspilota* $L = 9.1-9.3$) and at least two last antennal segments infuscate (in *A. hexaspilota* only last antennal segment and occasionally apex of penultimate segment are infuscate). *A. hexaspilota* usually forms aberrations with only few and very small spots on elytral disc, while in *A. miliaris* distinctly maculate forms predominate. In other species groups only males of *A. sarawacensis* from *A. sanctaecrucis* group may look similar to the palest forms of *A. miliaris*. In *A. sarawacensis* elytral disc of is always uniformly yellow, and mandibles are without teeth (as in other species of *A. sanctaecrucis* group), while in *A. miliaris* at last anterior border of explanate margin of elytra is infuscate and mandibles are toothed.

DESCRIPTION

Male: $L = 9.7-15.7$; $W = 9.1-15.8$; $Lp = 3.0-4.7$; $Wp = 5.5-9.4$; $L/W = 0.95-1.13$; $Wp/Lp = 1.82-2.13$; Female: $L = 11.5-14.9$; $W = 10.1-13.1$; $Lp = 3.3-4.3$; $Wp = 6.5-8.7$; $L/W = 1.07-1.21$; $Wp/Lp = 1.88-2.13$. Body circular (figs 373-375), sexual dimorphism varies between populations (figs 374, 375), males from the Philippines, Sumatra and Ceylon often hypertrophic, much wider than females; in continent populations sexual dimorphism is usually less pronounced than in insular populations.

Pronotum and scutellum yellow. Elytral disc yellow, with variable pattern of black spots. In the palest form only humeral calli with spot and anterior margin of marginalia narrowly black (fig. 381), in the darkest form almost whole elytra black with small yellow postscutellar area, yellow window in the middle of marginalia, and yellow spot along central margin of marginalia (fig. 393). These extremes are connected by a spectrum of intermediates (figs 382-392). Explanate

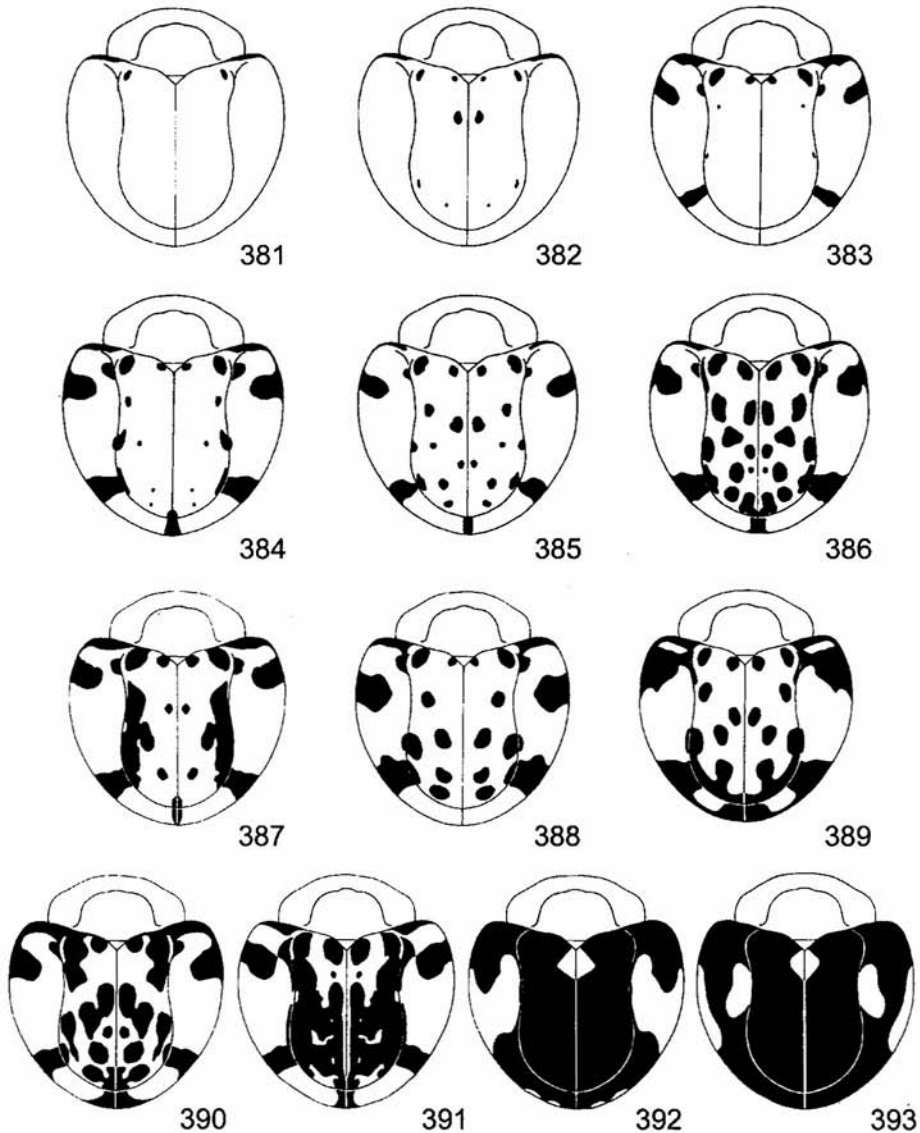
margin of elytra rarely immaculate (figs. 381, 382), usually with both humeral and posterolateral spots, humeral spots usually separated from anterior margin of marginalia, only in the darkest form extend to anterior border of explanate margin. Ventrites and legs uniformly yellow, only sometimes a brown to black transverse spot in posterior part of metathorax. Abdomen in the middle infuscate to black, thorax occasionally black except for lateral plates and central part. Antennae



374-379. *Aspidimorpha miliaris*: 374, 375 - body in dorsal view (374 - female, 375 - male), 376 - body in lateral view, 377 - head and prosternum, 378 - inner side of claw, 379 - outer side of claw, 380 - antenna

yellow, usually three, occasionally only two last segments infuscate to black, sometimes segments 7 and 8 also infuscate.

Pronotum elliptical, 1.82-2.13 times wider than long, with maximum width in 1/3 basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.



381-393. *Aspidimorpha miliaris*: variation of dorsal pattern

Elytral base distinctly wider than base of pronotum. Humeral angles broadly rounded. Elytral disc regularly convex with top of convexity in postscutellar point, without tubercles (fig. 376) and impressions. Puncturation regular, fine to moderately coarse, distinct along the whole length of disc. Second interval usually with additional sparse, irregularly scattered punctures, sometimes also there are additional punctures in anterior part of interval 3 and 4. In populations from eastern part of range (Oriental region) punctures are usually finer and denser, rows tend to be irregularity, and additional punctures on intervals more numerous than in populations from New Guinea and Australia, in which punctures are coarser, rows more regular, additional punctures on intervals less numerous, intervals 3 and 4 sometimes without punctures. Intervals mostly equal in width, approximately five times wider than punctures. Surface of intervals glabrous and shiny to slightly dull. Surface of elytra is more glabrous in populations from New Guinea and Australia than in populations from most part of the Oriental region. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura without hairs.

Clypeus 1.5 times wider than long, slightly convex. Labrum broad, shallowly emarginate to 1/5 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, with elongate impression along middle (fig. 377).

Length ratio of antennal segments: 100: 50: 104: 71: 64: 54: 77: 64: 66: 66: 100, segment 3 approximately two times longer than segment 2 and approximately 1.4 times longer than segment 4 (fig. 380).

Claws with distinct pecten on both sides. Inner pecten with three to five almost equal teeth extending to 1/3-2/5 length of claw (fig. 378). Outer pecten with four equal, very short teeth, only slightly extending beyond margin of claw (fig. 379).

Aedeagus slim, in populations from the Oriental region usually almost parallel-sided to slightly widened apically, broadly rounded apically, with obtuse apical process; in populations from New Guinea and Australia aedeagus is usually distinctly widened apically, with apical process very small, often obsolete. Also, in some insular Oriental populations aedeagus slightly differs from typical one, e.g. in hypertrophic males from Sumatra aedeagus is usually slimmer than in continental populations, while in populations of hypertrophic males from the Philippines and New Guinea it is stouter, with less marked apical process than in populations from India or Indochina. Apical part distinctly curved ventrad. Ventral side without membrane (figs 363, 364).

HOST PLANTS

Convolvulaceae: *Calonyction bona-nox*, *Convolvulus* sp., *Ipomoea triloba*, *I. pescaprae*, *I. batatas* (GRESSITT 1952); *Ipomoea* sp. (TAKIZAWA 1980, 1985 a; MEDVEDEV i DAN 1982).

TYPE MATERIAL

Aspidomorpha miliaris: 4 syntypes: "St. Helenae" "400.71" (3 ZMK, 1 BMNH).

Aspidomorpha miliaris ab. *flaveola*: 4 syntypes: "Java Staud" (ZMHU).

Aspidomorpha miliaris ab. *inundata*: 3 syntypes: "Manila W. SCHULTZE" (ZMHU).

Cassida quatuordecimpunctata: type lost.

Aspidomorpha celebensis: holotype: "Museum Paris, Célébés Macassar, Jacquinet 1841" (MNHM).

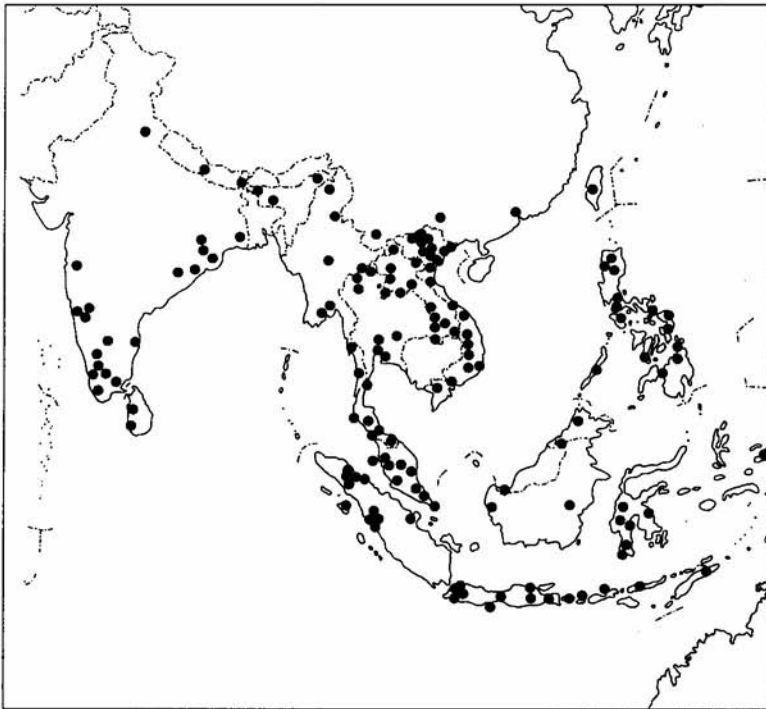
Aspidomorpha amplissima: lectotype: "Manilla" Mhm." "Type" (NRS) – designated by BOROWIEC (1999).

DISTRIBUTION

Widespread, known from the whole Oriental Region, both continental and insular, and in the Australian Region from New Guinea to NE Australia (fig. 394).

REMARKS

A. miliaris is the most common and widespread species, the only one present in whole Oriental and part of Australian Regions. It is especially variable in body shape and elytral pattern. Populations from some islands (Sumatra, Philippines) are more dimorphic sexually than from other parts of the range; males from these populations tend to form hypertrophic phenotypes with extremely wide elytral marginalia. Populations from New Guinea and Australia usually have reduced



394. Distribution of *Aspidomorpha miliaris*

elytral pattern; they also are slimmer, with more glabrous surface of elytra than in populations from the Oriental Region. Also, aedeagi slightly vary geographically. Sometimes different forms occur in the same areal e.g. on Sumatra populations of small specimens with hypertrophic male marginalia and slim aedeagi were observed, next to typical large form with less dimorphic elytra and stout aedeagi. On Philippine Is. occur both hypertrophic and typical form, although hypertrophic males from this region have aedeagi usually stouter than males of typical form. Strongly hypertrophic males occur also in some populations from Malaysia. The variability is usually mosaic, only populations from Australian Region have several correlated characters. REID (pers. inf.) suggested that Australian forms belong to a separate species. Unfortunately, I had no possibility to study populations from the border area between Australian and Oriental Regions (Moluccas, Seram, Tenimber, Aru) thus cannot confirm the presumed morphological gaps.

Aspidimorpha (s. str.) *moluccana* SPAETH, 1935

(figs 395-401, tab. 9: 8)

Aspidomorpha moluccana SPAETH, 1935 b: 94.

Aspidimorpha (*Aspidimorpha*) *moluccana*: BOROWIEC, 1999: 192.

DIAGNOSIS

The taxonomic position of *A. moluccana* is unclear, because only females are known. In small body size it is similar to *A. indica* and *A. furcata* groups. *A. moluccana* differs from all members of either group in almost completely black elytral disc and yellowish-brown spots on explanate margin of elytra. Puncturation of its elytral disc is finer than in remainder species, gradually smaller posterad, on slope barely marked.

DESCRIPTION

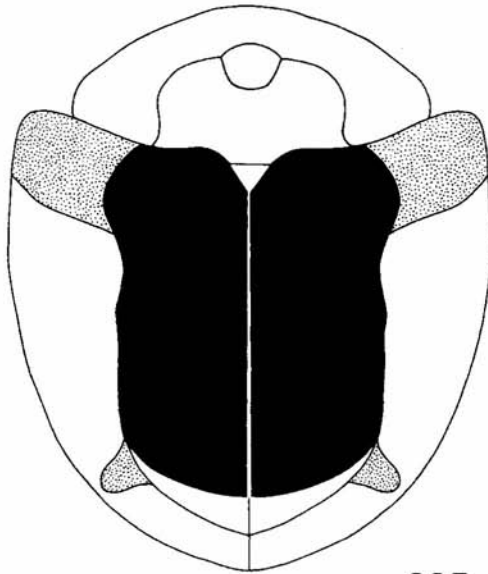
L = 7.7; W = 6.4; Lp = 2.4; Wp = 4.9; L/W = 1.20; Wp/Lp = 2.04. Body slightly triangular (fig. 395), sexual dimorphism unknown, the only two known specimens are females.

Pronotum and scutellum yellow. Elytral disc black, except for narrow, yellow, transverse band at posterior border of disc. Explanate margin of elytra with yellowish brown humeral and posterolateral spots of indistinct borders. Humeral spots extend to extreme margin, posterolateral spots to half width of explanate margin (fig. 395). Ventrites, legs, and antennae uniformly yellow.

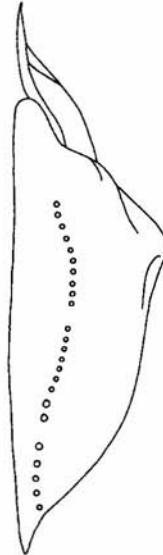
Pronotum ellyptical, two times wider than long, with maximum width in basal 1/3 length, sides moderately rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Elytral base distinctly wider than base of pronotum. Humeral angles protruding anterad, form right but blunt angle. Elytral disc convex with distinct, conical postscutellar tubercle (fig. 396), with postscutellar and principal but without lateral impressions. Puncturation regular, very fine, gradually finer posterad, on

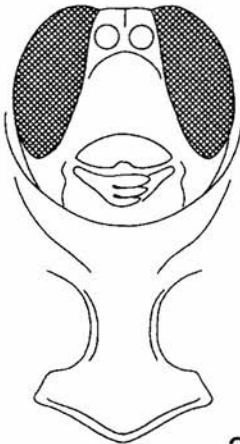
slope barely marked. Intervals equal in width, approximately six times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with hairs.



395



396



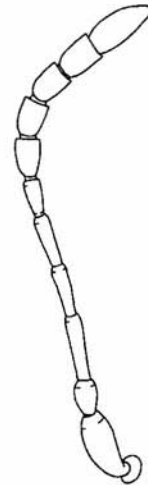
397



398



399



400

395-400. *Aspidimorpha moluccana*: 395 - body in dorsal view, 396 - body in lateral view, 397 - head and prosternum, 398 - inner side of claw, 399 - outer side of claw, 400 - antenna

Clypeus 1.4 times wider than long, in apical half with distinct impression. Labrum broad, emarginate to 1/4 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 397).

Length ratio of antennal segments: 100: 53: 100: 80: 80: 50: 56: 50: 50: 103, segment 3 approximately 1.9 times longer than segment 2 and approximately 1.3 times than segment 4 (fig. 400).

Claws with distinct pecten on both sides. Inner pecten with four teeth extending to 2/5-1/2 length of claw (fig. 398), outer pecten with two teeth extending to 1/3 length of claw (fig. 399).

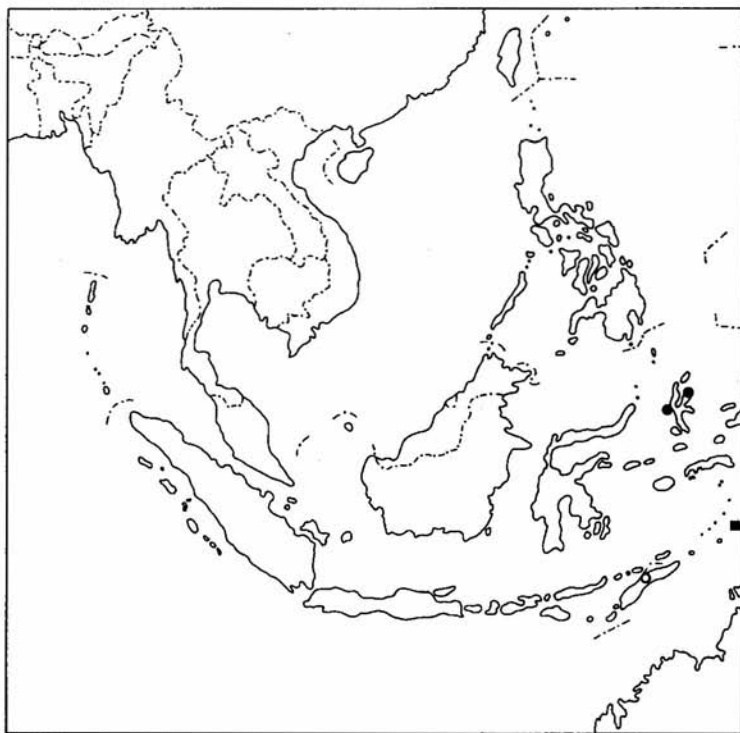
Aedeagus unknown, two known specimens are females.

TYPE MATERIAL

Holotype: "Halmaheira Soakonorra Kükenthal." (SM); paratype: "Ternate Aequisonorra, Beccari, 1874.XI" (MM).

DISTRIBUTION

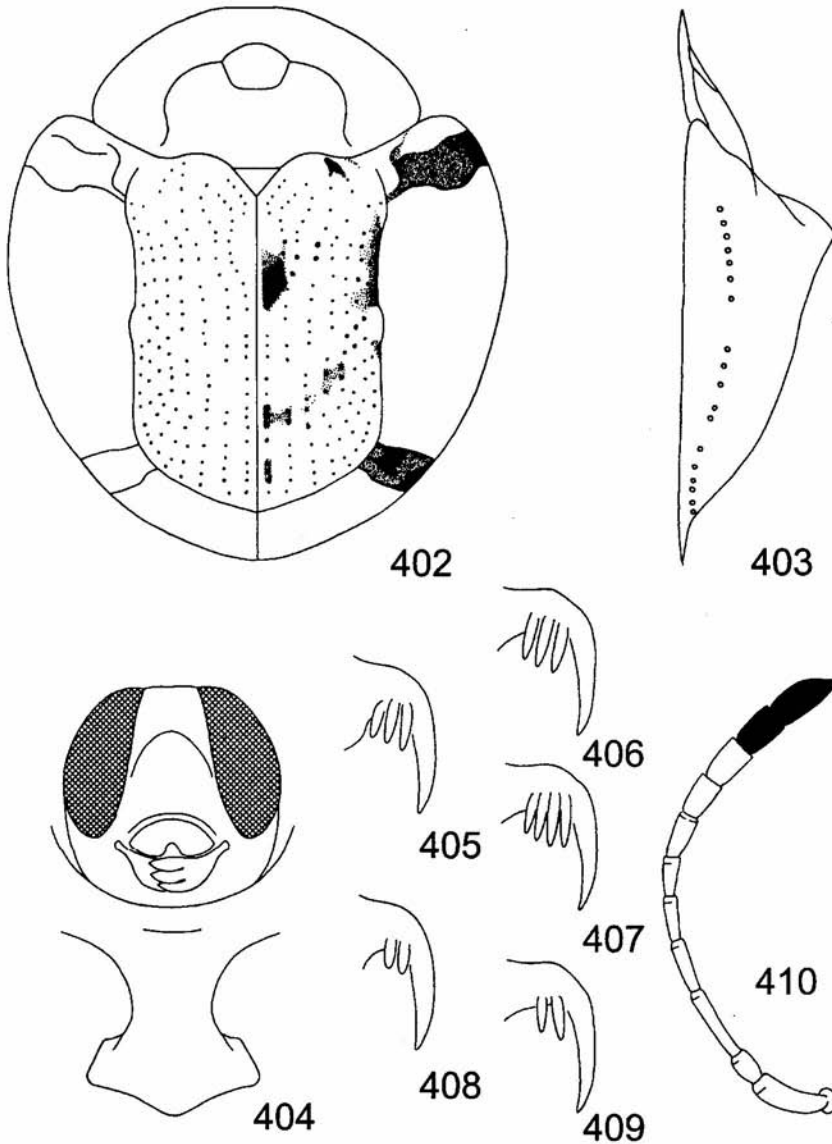
Indonesia: Moluccas. Known only from two specimens (fig. 401).



401. Distribution of *Aspidimorpha moluccana* (black circles), *Aspidimorpha pacalis* (black square) and *Aspidimorpha timorensis* (white circle)

***Aspidimorpha* (s. str.) *musta* SPAETH, 1914 new status**
(figs 287, 368, 369, 402-412, tab. 8: 2)

Aspidomorpha inquinata ssp. *musta* SPAETH, 1914 c: 545; BOROWIEC, 1999: 189.



402-410. *Aspidimorpha musta*: 402 - body in dorsal view, 403 - body in lateral view, 404 - head and prothorax, 405, 406, 407 - inner side of claw, 408, 409 - outer side of claw, 410 - antenna

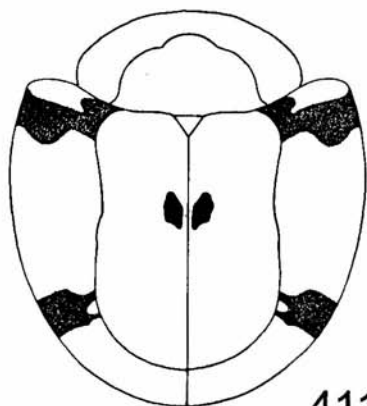
DIAGNOSIS

A member of *A. dorsata* group. At first glance *A. musta* is the most similar to *A. inquinata*. Both species have dark maculate elytra, but *A. inquinata* differs in larger size and heavily maculate elytra. These two species are allopatric, *A. musta* is mostly continental distributed from E India to Indochina (including Andamanes), while *A. inquinata* is insular and occurs on Java, Bali, and Lombok. Elytral pattern of *A. musta* is also similar to that of *A. malaccana* from the *A. sanctaecrucis* group, but *A. malaccana* has toothless mandibles.

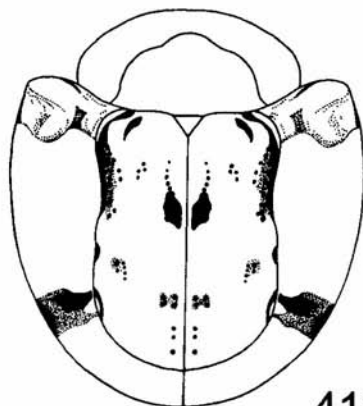
DESCRIPTION

Male: L = 8.2-8.3, W = 7.2-7.3, Lp = 2.5-2.7, Wp = 5.00-5.15, L/W = 1.14, Wp/Lp = 1.91-2.00; female: L = 9.2-9.6, W = 8.0-8.2, Lp = 2.7-3.1, Wp = 5.40-5.75, L/W = 1.15-1.17, Wp/Lp = 1.85-2.00. Body slightly pentagonal (fig. 402). Sexual dimorphism barely marked, males slightly smaller than females.

Pronotum and scutellum yellow. Disc yellow with dark brown to black pattern: elongate, more or less rhomboidal spot on interval 2 in 1/3 length of disc, and punctures marked with areola in first row from 2/3 length of disc to posterior border, on interval 4 at basal margin of elytra, on interval 4 in principal impressions, on sides of disc, and in 2/3 length of disc, sometimes areolae coalesce and form more or less visible V- shaped pattern across elytral disc. In dark forms areolae on sides of disc expand and coalesce, form in humeral area an elongate spot (fig. 412). In pale forms elytral disc only with rhomboidal spot on interval 2 in 1/3 length of disc (fig. 411). Explanate margin of elytra usually with brown to black humeral and posterolateral spots, humeral spots with yellow window at its basal margin. Both spots are distinctly darker on the ventral as compared to the dorsal side of marginalia (figs 411, 412). Ventriles and legs yellow. Antennae yellow, two last segments black, sometimes segment 9 slightly infuscate.



411



412

Pronotum elliptical, 1.87-1.97 times wider than long, with maximum width in 1/3 basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Elytral base distinctly wider than base of pronotum. Humeral angles protruding anterad, form almost right but blunt angle, less marked than in related *A. inquinata*. Disc convex, with distinct, conical postscutellar tubercle (fig. 403) and more or less distinct principal impressions, without postscutellar and lateral impressions. Puncturation moderately coarse, regular, distinct along the whole length of disc. Intervals equal in width, only on sides narrower than on the top, approximately five times wider than rows. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with sparse, long, erect hairs, often broken in dried specimens.

Clypeus 1.3 times wider than long, slightly convex, with elongate impression in the middle. Labrum broad, emarginate almost to 1/2 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 404).

Length ratio of antennal segments: 100: 44: 103: 73: 59: 53: 65: 53: 59: 59: 94, segment 3 approximately 2.3 times longer than segment 2 and approximately 1.4 times longer than segment 4 (fig. 410).

Claws with distinct pecten on both sides. Inner pecten with three (sometimes four) teeth extending to 2/5-1/2 length of claw (figs 405-407). Outer pecten with two teeth extending to 1/3 length of claw (figs 408, 409).

Aedeagus slim, almost parallel-sided, apex broadly rounded with broad and obtuse apical process. Apical part curved ventrad. Ventral side without membrane (figs 368, 369).

TYPE MATERIAL

Syntype "Assam" "cotyp" (MM); syntype "Andamans" "cotyp" (MM); 2 syntypes "Andaman Islands" "Cape Vemberley" "Type" and "cotyp" (MM); syntype "Andaman Is." "cotyp" (MM); 3 syntypes: "Tenasserim, Thagata, Fea, Apr. 1887" (MCSNG); syntype: "Tenasserim, Meekan, Fea, Apr. 1887".

DISTRIBUTION

Andaman Is.; Burma; India: Assam; Laos; Malaysia; Thailand; Vietnam (fig. 287).

REMARKS

My examination of many specimens of *A. musta* and *A. inquinata* shows constant and clear differences between these taxa. Therefore *A. inquinata* ssp. *musta* should be treated as a good species.

Aspidomorpha (s. str.) *mutilata* BOHEMAN, 1854

(figs 365-367, 413-430, tab. 12: 1-5)

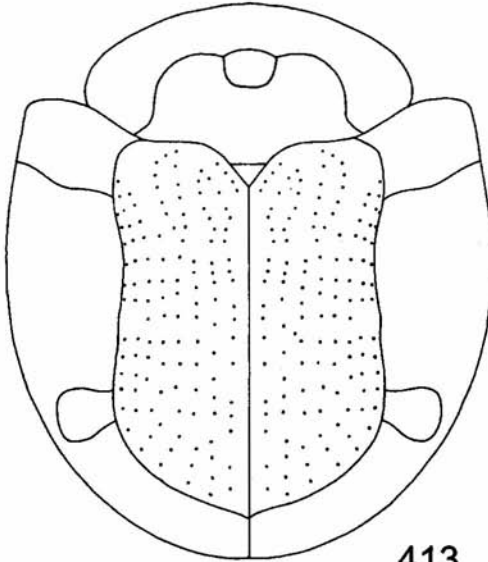
Aspidomorpha mutilata BOHEMAN, 1854: 316, 1856: 115, 1862: 280; BALY, 1863: 14; GEMMINGER and HAROLD, 1876: 3650; SPAETH, 1914 c: 545, 1914 c: 69, 1926 c: 118; HINCKS, 1953: 70; BOROWIEC, 1990 a: 687; KIMOTO et al., 1995: 106; MOHAMEDSAID, 2000 a: 359.

Aspidomorpha mutilata: BOROWIEC, 1996: 11.

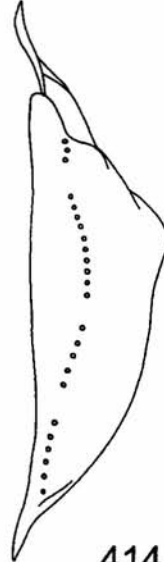
Aspidomorpha (Aspidomorpha) mutilata: BOROWIEC, 1999: 193.

Aspidomorpha mutilata ab. *jucunda* SPAETH, 1914 c: 546.

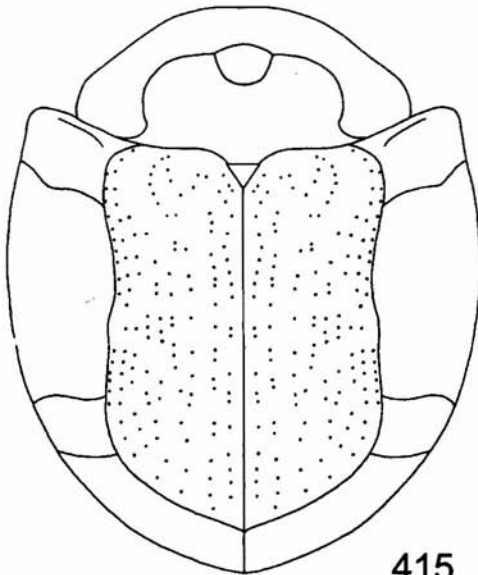
Aspidomorpha mutilata var. *jucunda*: SPAETH, 1914 e: 69.



413



414



415



416

413-416. *Aspidomorpha mutilata*: 413, 414 - male, 415, 416 - female; 413, 415 - body in dorsal view, 414, 416 - body in lateral view

Coptocyclus glabrata BOHEMAN, 1855: 469, 1856: 198, 1862: 475; SPAETH, 1909: 396 (as syn. of *A. egena* BOH.); HINCKS, 1953: 70.

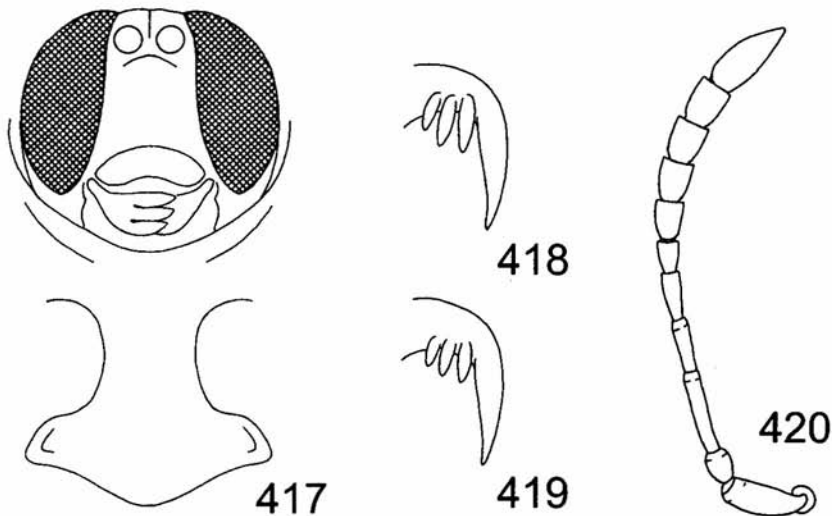
Ctenochira glabrata: GEMMINGER and HAROLD, 1876: 3664; WAGENER, 1877: 73.

Aspidomorpha glabrata: SPAETH, 1914d: 546; HINCKS, 1953: 70.

Aspidomorpha mutilata ab. *glabrata*: SPAETH, 1914 e: 69.

DIAGNOSIS

A member of *A. indica* group. In small size it is also similar to *A. furcata* group, but differs in slim, not spoon-like aedeagus. Characteristic for *A. mutilata* is coarse puncturation of sides of elytral disc. Only *A. indica* has almost as strong puncturation as *A. mutilata*, but in *A. mutilata* it is distinctly sparser, especially in posthumeral part of disc. *A. indica* is usually larger (length 6.2-8.5 mm), and its sexual dimorphism is barely marked, while *A. mutilata* is smaller (length 5.9-8.0 mm), with distinct sexual dimorphism (males stouter than females, with elytra less converging posterad). Both species are mostly allopatric, *A. indica* is generally continental, with a few localities in Sumatra, while *A. mutilata* is very common in Java, Bali, and Lombok but very rare in Sumatra and southern Malay Pen. At first glance *A. mutilata* also is similar to *A. difformis*, but *A. difformis* differs in low and obtuse postscutellar tubercle, and apex of aedeagus strongly curved ventrad. These two species are allopatric - *A. difformis* occurs in eastern Palearctic Region south to Guizhou Province in China. *A. mutilata* also is similar to forms of *A. furcata* with spots on explanate margin of elytra, but *A. furcata* differs in elytral disc with fine puncturation and spoon-shaped aedeagus. *A. amabilis* and *A. mutilata* are sympatric, but *A. amabilis* has elytral disc with fine puncturation and spoon-shaped aedeagus.

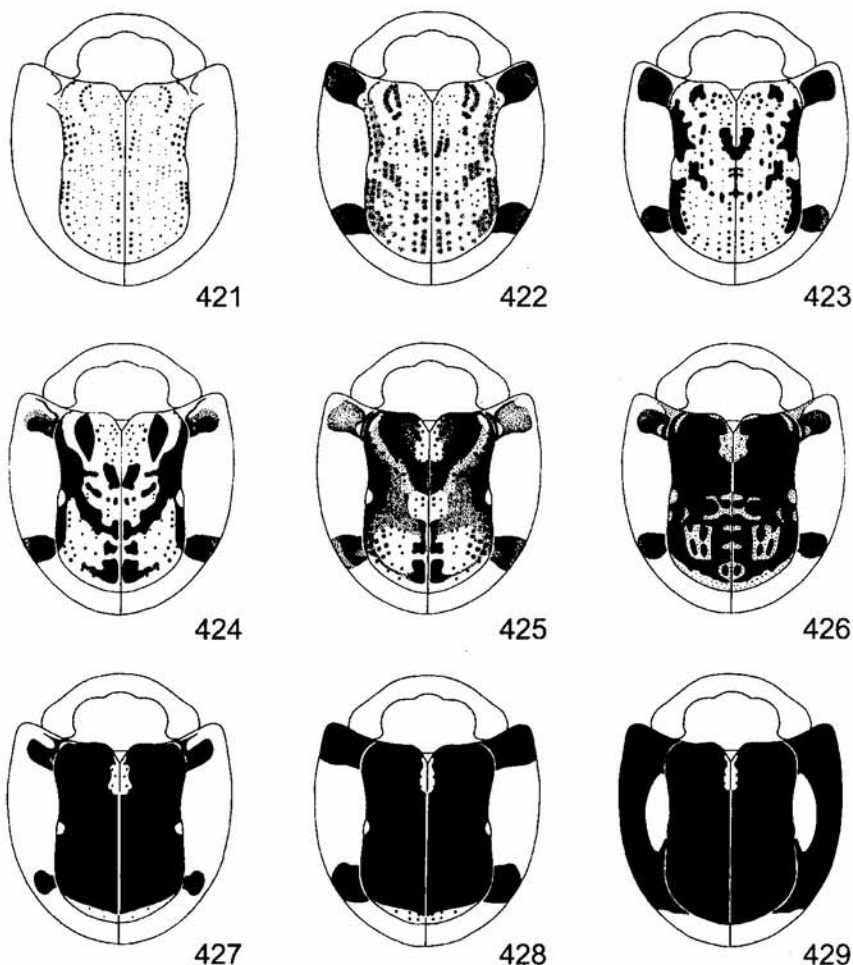


417-420. *Aspidomorpha mutilata*: 417 - head and prosternum, 418 - inner side of claw, 419 - outer side of claw, 420 - antenna

DESCRIPTION

Male: $L = 5.9-7.2$; $W = 4.9-6.3$; $Lp = 1.8-2.1$; $Wp = 3.5-4.4$; $L/W = 1.13-1.22$; $Wp/Lp = 1.84-2.22$. Female: $L = 6.4-8.0$; $W = 5.4-6.7$; $Lp = 2.0-2.6$; $Wp = 3.8-4.8$; $L/W = 1.18-1.25$; $Wp/Lp = 1.84-1.95$. Body oval to almost circular (figs 413, 415). Sexual dimorphism distinct, males smaller and stouter than females, apex of elytra in male broadly rounded (fig. 413), in female sides of elytra slightly converging posterad (fig. 415).

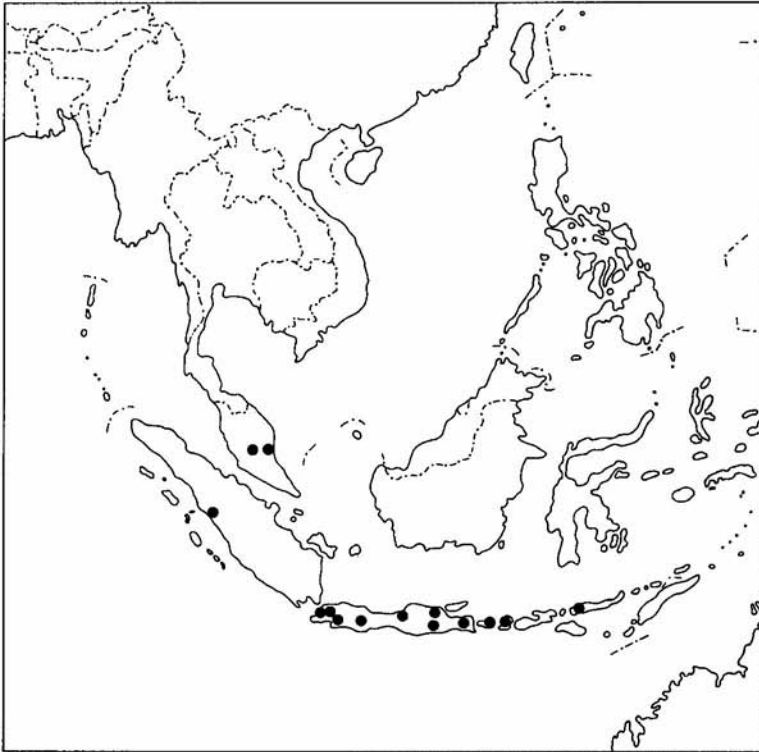
Pronotum and scutellum yellow. In females disc of elytra usually yellow with punctures marked with yellowish-brown or brown areola (fig. 421). Often areolae on sides of disc, in anterior part at fourth interval, and on the top of disc are larger and darker than other (figs 422, 423). In males areolae of sides of anterior part of



421-429. *Aspidimorpha mutilata*: variation of dorsal pattern

disc, and on the top of disc increase to form dark brown pattern with: elongate spot along each side of disc, connected with transverse band in 1/3 length of disc, spot on fourth interval at basal margin of elytra, spot on the top of postscutellar tubercle, and spot in posterior part of disc, between intervals 1-3 (fig. 424). Often the pattern extends, especially in anterior part of disc (fig. 426), or disc is mostly dark brown except a yellow spot in postscutellar area and yellow transverse band along posterior border of disc (figs 427-429). Sometimes males are as pale as females, but females only occasionally are as dark as males. Explanate margin of elytra usually with humeral and posterolateral spots (figs 422-428). In pale forms explanate margin sometimes without spots (fig. 421). Spots are usually of same colour as pattern on disc or distinctly darker at base and paler apically, and often do not extend to extreme margin of explanate margin. In the darkest forms humeral spots are connected with posterolateral spots by elongate band along extreme margin (fig. 429). Ventrites and legs yellow. Antennae yellow, last segment usually slightly darker yellow or yellowish-brown.

Pronotum elliptical, 1.84-2.22 times wider than long, with maximum width in basal 1/3 length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.



430. Distribution of *Aspidimorpha mutilata*

Elytral base wider than base of pronotum. Humeral angles protrude anterad and form almost right angle. Extreme margin of elytra, especially in male, slightly emarginate behind humeral angles. Elytral disc convex with obtuse, conical postscutellar tubercle (figs 414, 416) and with more or less distinct principal impressions. Puncturation regular, moderately coarse, distinct along the whole length of disc. Puncturation of disc sides, behind humeral callus distinctly coarser than on top of disc. Intervals mostly equal in width, 2-3 times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with sparse hairs.

Clypeus 1.2 times wider than long, slightly convex, in anterior part with more or less distinct impression. Labrum broad, emarginate to 1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 417).

Length ratio of antennal segments: 100: 39: 100: 63: 57: 36: 45: 48: 51: 51: 106, segment 3 approximately 2.6 times longer than segment 2 and approximately 1.6 times than segment 4 (fig. 420).

Claws with distinct pecten on both sides. Inner pecten with three teeth extending to 2/5 length of claw (fig. 418), outer pecten with three teeth extending to 1/3 length of claw (fig. 419).

Aedeagus slim, slightly widened apically, apex broadly rounded, with moderately and obtuse apical process. Apical part strongly curved ventrad. Ventral side with small, longitudinally striated membrane (figs 365-367).

TYPE MATERIAL

Aspidomorpha mutilata: lectotype: "29306" "mutilata Bhm. Java" "mutilata N Java Bhm" (ZMHU) – designated by BOROWIEC (1999); paralectotype: "29306" "mutilata Bhm. Java" "mutilata N Java Bhm" (ZMHU); paralectotype: "Java" "Schh." "Type" (NRS).

Coptocyclus glabrata: holotype: "Brasil" "Sturm" "Type" (NRS).

Aspidomorpha mutilata ab. *jucunda*: 3 syntypes: "Java, Malang" "Type" (MM).

DISTRIBUTION

Indonesia: Bali, Java, Lombok, Sumatra; Malaysia: Pahang (fig. 430).

Aspidomorpha (s. str.) *orbicularis* BOHEMAN, 1854

(figs 235-239, 431-437, 458, 459, tab. 10: 4-6)

Aspidomorpha orbicularis BOHEMAN, 1854: 255, 1856: 106; 1862: 258; GEMMINGER and HAROLD, 1876: 3650; SPAETH, 1914 e: 69; Shaw, 1972: 65; BOROWIEC, 1990 a: 688.

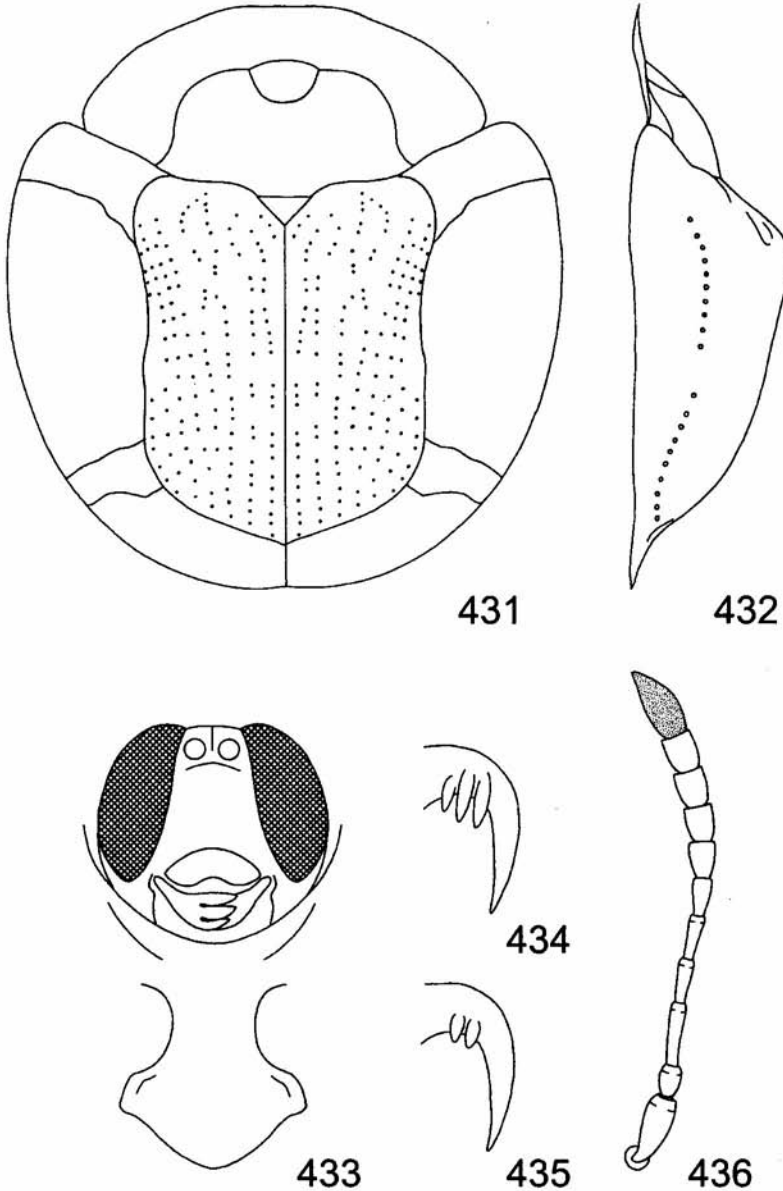
Aspidomorpha orbicularis: BOROWIEC, 1996: 12.

Aspidomorpha (*Aspidomorpha*) *orbicularis*: BOROWIEC, 1999: 195.

Aspidomorpha Bakeri SPAETH, 1916: 349; BOROWIEC, 1990 a: 688 (as syn.).

DIAGNOSIS

A. orbicularis and *A. fusconotata* form a distinct group, which is characterized by circular body and elytral disc without postscutellar tubercle. Both are endemic to the Philippines. At first glance these species are very similar, espe-

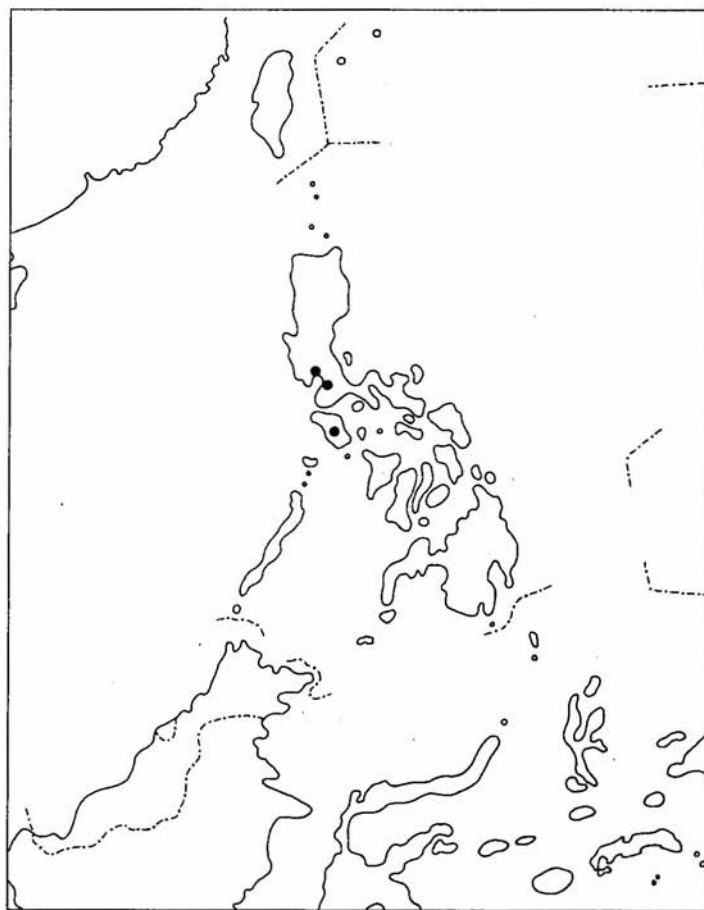


431-436. *Aspidimorpha orbicularis*: 431 - body in dorsal view, 432 - body in lateral view, 433 - head and prosternum, 434 - inner side of claw, 435 - outer side of claw, 436 - antenna

cially have similarly variable pattern on elytral disc, but forms with dark ring on elytral disc predominate in *A. orbicularis*, while most specimens of *A. fusconotata* have reticulate elytra. Also forms with spots on explanate margin of elytra are more common in *A. orbicularis* than in *A. fusconotata*. *A. orbicularis* is usually smaller than *A. fusconotata*. The best distinguishing character is length of inner pecten of claws, which extends only to 1/3 length of claw in *A. orbicularis*, and at least to 2/5 in *A. fusconotata*.

DESCRIPTION

Male: L = 6.4-7.1; W = 5.8-6.5; Lp = 2.2-2.4; Wp = 4.2-4.7; L/W = 1.06-1.11; Wp/Lp = 1.82-2.00; Female: L = 8.3; W = 7.6; Lp = 2.7; Wp = 5.2; L/W = 1.09; Wp/Lp = 1.92. Body circular (fig. 431). Sexual dimorphism barely marked but the only examined female is distinctly larger than all examined males.



437. Distribution of *Aspidimorpha orbicularis*

Pronotum and scutellum yellow. Elytral disc yellow with yellowish-brown or dark brown ring which surrounds disc usually without touching its border (figs 238, 239). In some cases the ring can be reduced to reticular pattern, which usually is stronger coloured on sides and in posterior part of disc. Such forms usually have small dark ring in postscutellar area (fig. 236). In extreme cases ring is reduced to elongate spot along sides of disc (fig. 235). Forms with distinct ring on disc have explanate margin of elytra with humeral and posterolateral spots (figs 238, 239). In forms with reticular pattern on disc or with elongate spot on each sides of disc explanate margin without spots (figs 235-237). Ventrites and legs yellow. Antennae yellow, last segment more or less distinctly infusate, but never black.

Pronotum elliptical, 1.82-2.00 times wider than long, with maximum width in the middle, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Elytral base wider than base of pronotum. Humeral angles rounded, slightly protrude anterad. Elytral disc regularly convex, with top of convexity in postscutellar point, without postscutellar tubercle (fig. 432), and with shallow principal impressions, without postscutellar and lateral impressions. Punctuation moderately coarse, distinct along the whole length of disc and regular. Intervals equal in width, three to four times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with very sparse hairs, in male sparser than in female.

Clypeus 1.4 times wider than long, slightly convex, without impression. Labrum broad, emarginate to 1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig.433).

Length ratio of antennal segments: 100: 43: 90: 66: 56: 53: 53: 50: 53: 110, segment 3 approximately 2.1 times longer than segment 2 and approximately 1.4 times longer than segment 4 (fig. 436).

Claws with pecten on both sides. Inner pecten with three teeth extending to 1/3 length of claw (fig. 434), outer pecten with two short teeth extending to 1/5 length of claw (fig. 435).

Aedeagus slim, slightly widened apically, apex broadly rounded with broad and obtuse apical process. Apical part gently curved ventrad. Ventral side without membrane (figs 458, 459).

TYPE MATERIAL

Aspidomorpha orbicularis: lectotype: "Ind. or." "M. Gall." "Type" (NRS) – designated by BOROWIEC (1999); paralectotype with the same data belongs to *A. fusconotata* Boh.; paralectotype: "29285" "orbicularis Boh.* Manila Meyer" (ZMHU).

Aspidomorpha bakeri: holotype: "Los Banos, P.I., Baker" "Typ. unic." (MM).

DISTRIBUTION

Philippines: Luzon, Mindoro (fig. 437).

***Aspidomorpha* (s. str.) *orientalis* BOHEMAN, 1856**

(figs 438-447, 450-452, 606, tab. 3: 4-6)

Aspidomorpha orientalis BOHEMAN, 1856: 107; 1862: 259; GEMMINGER and HAROLD, 1876: 3650;

SPAETH, 1914 c: 69; MAULIK, 1919: 336 (incl. fig.); BOROWIEC, 1990 a: 688.

Aspidomorpha (*Aspidomorpha*) *orientalis*: BOROWIEC, 1999: 195.*Aspidomorpha olivacea* WAGENER 1881: 49; SPAETH, 1914 c: 547 (as syn.).*Aspidomorpha orientalis* var. *olivacea*: MAULIK, 1919: 336.*Aspidomorpha orientalis* ab. *olivacea*: SPAETH, 1914 c: 69.

DIAGNOSIS

A very distinct species, more similar to the *A. cincta* group from Africa than to any species from the Oriental Region. Because of elongate body, regular convex elytral disc without tubercles, semicircular pronotum with maximum width at the base, and elytral base only slightly wider than base of pronotum, *A. orientalis* is more similar to the Oriental *Conchyloctenia nigrovittata* than to the members of the genus *Aspidomorpha*. However, *A. orientalis* has flat clypeus, like other species of the genus *Aspidomorpha*, while in the genus *Conchyloctenia* clypeus is always distinctly convex, especially its anterior margin before antennal insertions. Both species distinctly differ in elytral pattern and ground colour of elytra which is yellow in *A. orientalis* and red in *Conchyloctenia nigrovittata*. *A. orientalis* is one of only few species from Oriental Region with partly black ventrites.

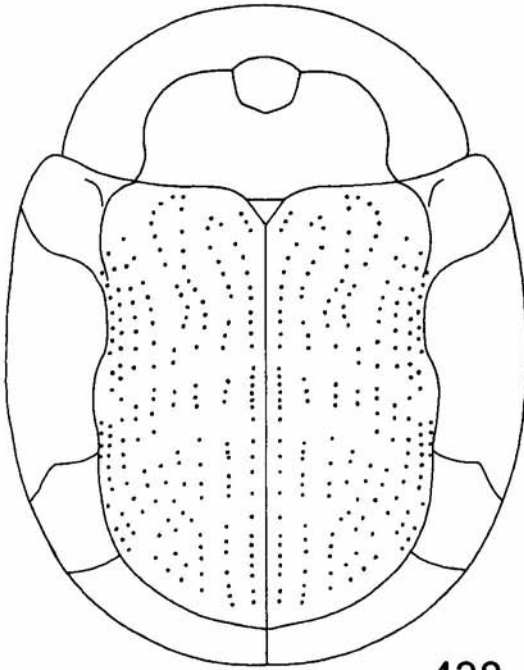
DESCRIPTION

L = 7.8-10.0; W = 6.3-7.5; Lp = 2.3-3.2; Wp = 4.9-6.0; L/W = 1.24-1.42; Wp/Lp = 1.87-2.16. Body oval (fig. 438). Sexual dimorphism indistinct, male slightly stouter than female.

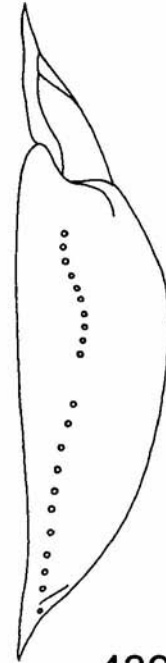
Pronotum and scutellum yellow. Elytral disc yellow, in typical forms with numerous black spots shown in figs 444, 445. In rare forms, the pattern on disc composed of transverse bands and elongate spots, in extreme cases disc of elytra black with a small yellow spot behind scutellum (fig. 447). Rarely spots on disc brown (fig. 446). In typical forms explanate margin of disc with humeral and posterolateral spots. Sometimes humeral spots reduced to a small spot at the base of humeral callus (fig. 444). In the darkest forms extreme margin also has sutural spot (figs 446, 447). Clypeus, prosternum, and large part of mesothorax yellow. Margins of coxal cavities and lateral plates of mesosternum black. Base of metathorax with a large, black, transverse spot. Abdomen brown to black, except for yellow apex and sides of abdominal sternites. Dark colour sometimes reduced to a spot at the base of metathorax and to narrow brownish line along bases of abdominal sternites. Legs yellow. Antennae yellow, last segment usually infuscate, sometimes penultimate segments also slightly infuscate, especially at apex.

Pronotum semicircular, 1.87-2.16 times wider than long, with maximum width almost at the base. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Elytral base only slightly wider than base of pronotum. Humeral angles almost right. Disc regular convex, with top of convexity at 1/3-1/2 length of disc (fig. 439),



438



439



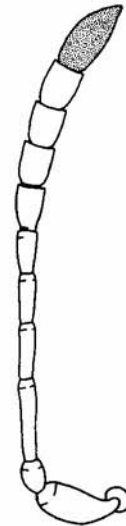
440



441



442



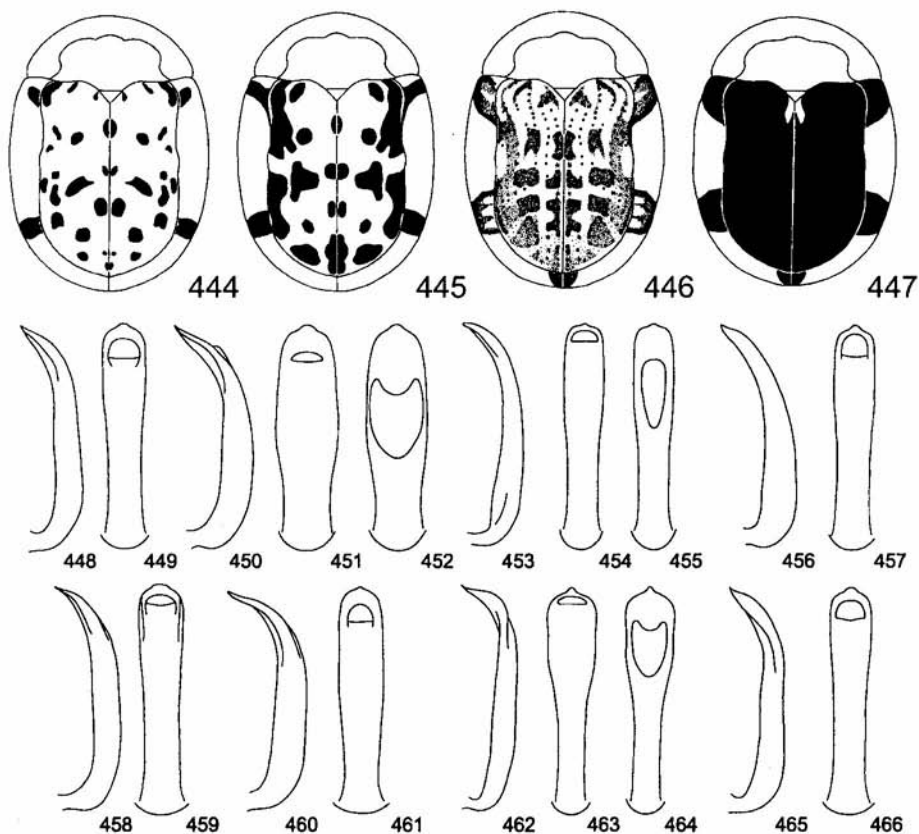
443

438-443. *Aspidimorpha orientalis*: 438 - body in dorsal view, 439 - body in lateral view, 440 - head and prosternum, 441 - inner side of claw, 442 - outer side of claw, 443 - antenna

in posterior half slightly depressed, without tubercles and impressions. Punctuation moderately coarse, sparse, distinct along the whole length of disc, slightly denser on sides and in posterior part of disc than on top. Intervals flat. Interval 3 usually slightly wider than the following one, both approximately four times wider than punctures, other intervals approximately three times wider than punctures. Surface of intervals glabrous. Explanate margin smooth and glabrous. Apex of elytral epipleura without hairs.

Clypeus 1.5 times wider than long, slightly convex. Labrum broad, emarginate to 1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, broad, with shallow impression in the middle (fig. 440).

Length ratio of antennal segments: 100: 40: 106: 73: 63: 56: 56: 50: 53: 53: 106, segment 3 approximately 2.7 times longer than segment 2 and approximately 1.5 times longer than segment 4 (fig. 443).



444-447. *Aspdimorpha orientalis*: variation of dorsal pattern; 448-466. Aedeagi: 448, 449 - *Aspdimorpha quadrilobata*; 450-452 - *A. orientalis*; 453-455 - *A. sanctaecrucis*; 456, 457 - *A. sarawacensis*; 458, 459 - *A. orbicularis*; 460, 461 - *A. ponderosa*; 462-464 - *A. suavis*; 465, 466 - *A. subcruciata*; 448, 450, 453, 456, 458, 460, 462, 465 - lateral; 449, 451, 454, 457, 459, 461, 463, 466 - dorsal; 452, 455, 464 - ventral

Claws with distinct pecten on both sides. Inner pecten with four, rarely five equal teeth extending to 2/5-1/2 length of claw (fig. 441), outer pecten with three teeth extending to 1/4 length of claw (fig. 442).

Aedeagus stout, widest at half length, with broad and obtuse apical process. Apical part moderately curved ventrad. Ventral side with broad membrane occupying almost the whole width of aedeagus (figs 450-452).

TYPE MATERIAL

Aspidomorpha orientalis: holotype: "Ind or" "Saund." "Type" (NRS).

Aspidomorpha olivacea: holotype: "Himalaya" "Typus" (MM).

DISTRIBUTION

N India: Punjab, Uttar Pradesh, and Sikkim (fig. 606).

Aspidomorpha (s. str.) *pacalis* SPAETH, 1926

(figs 401, 467-472, tab. 8: 3)

Aspidomorpha pacalis SPAETH, 1926 a: 310.

Aspidomorpha (*Aspidomorpha*) *pacalis*: BOROWIEC, 1999: 195.

DIAGNOSIS

A member of *A. dorsata* group, but more similar to *A. aurata* and *A. australasiae* from New Guinea, than to other species of the group from the Oriental Region. Some specimens of *A. aurata* are very similar in elytral pattern to *A. pacalis*, but *A. aurata* differs in longer inner pecten of claws extending at least to 2/5-1/2 length of claw, while in *A. pacalis* the pecten extends only to 1/3 length of claw. *A. australasiae* differs in lower and obtuse postscutellar tubercle. Among species from the Oriental Region similar are *A. suavis*, *A. timorensis*, *A. intermedia*, and *A. subcruciata*. *A. suavis* differs in dark pattern on elytral disc. *A. timorensis* is slimmer and has more acuminate humeral angles. *A. intermedia* and *A. subcruciata* have distinctly broader spots on explanate margin of elytra, and much broadly rounded humeral angles. None of these species occur on Tenimber Is., the only locality of *A. pacalis*.

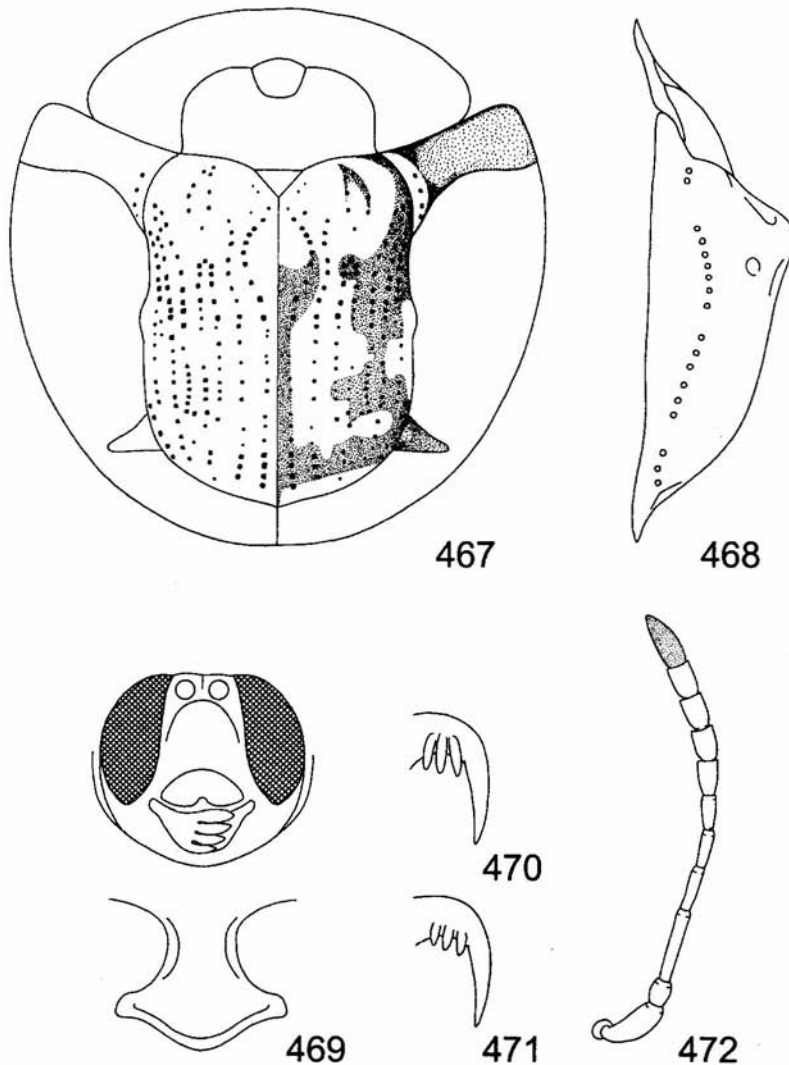
DESCRIPTION

L = 9.0; W = 8.3; Lp = 2.9; Wp = 5.7; L/W = 1.08; Wp/Lp = 1.96. Body almost circular (fig. 467). Sexual dimorphism unknown, the species is known only from holotype.

Pronotum and scutellum yellow. Elytral disc yellow with reddish-yellow pattern, with an elongate irregular spot along each side of disc, a spot on postscutellar tubercle, and a small, inverse-V spot at the base of fourth interval; elytral punctures with reddish-yellow areola. Explanate margin of elytra with complete yellowish-red humeral and incomplete posterolateral spots, extending only to half width of explanate margin (fig. 467). Ventrites and legs yellow. Antennae yellow, last segment brown.

Pronotum elliptical, 1.96 times wider than long, with maximum width in $2/5$ basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Elytral base wider than base of pronotum. Humeral angles slightly protrude anterad and form almost right angles. Disc convex, with distinct conical postscutellar tubercle (fig. 468), and distinct principal impressions, but without postscutellar and lateral impressions. Punctuation fine and regular, moderately coarse, slightly coarser on the sides of disc. Second interval wider than punctures, approximately



467-472. *Aspidimorpha pacalis*: 467 - body in dorsal view, 468 - body in lateral view, 469 - head and prosternum, 470 - inner side of claw, 471 - outer side of claw, 472 - antenna

seven times, remaining intervals five to six times. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous. Apex of elytral epipleura with hairs.

Clypeus 1.3 times wider than long, with shallow, elongate impression in the middle. Labrum broad, emarginate to 1/4 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 469).

Length ratio of antennal segments: 100: 40: 113: 70: 60: 46: 46: 50: 50: 50: 93, segment 3 approximately 2.8 times longer than segment 2 and approximately 1.6 times longer than segment 4 (fig. 472).

Claws with distinct pecten on both sides. Inner pecten with three teeth, extending to 1/3 length of claw (fig. 470), outer pecten with three teeth extending to 1/4 length of claw (fig. 471).

Aedeagus not available, the holotype is a female.

TYPE MATERIAL

Holotype: "Tenimber Sunda Ins." "pacalis m. SPAETH det. Typ. unic." "Typus" (MM).

DISTRIBUTION

Indonesia: Tenimber Is. [= Tanimbar] (fig. 401).

Aspidomorpha (s. str.) *ponderosa* BOHEMAN, 1862

(figs 203, 460, 461, 473-478, tab. 6: 3)

Aspidomorpha ponderosa BOHEMAN, 1862: 266; GEMMINGER and HAROLD, 1876: 3650; SPAETH, 1914 e: 72, 1926 a: 308; BOROWIEC, 1990 a: 688.

Aspidomorpha (*Aspidomorpha*) *ponderosa*: BOROWIEC, 1999: 196.

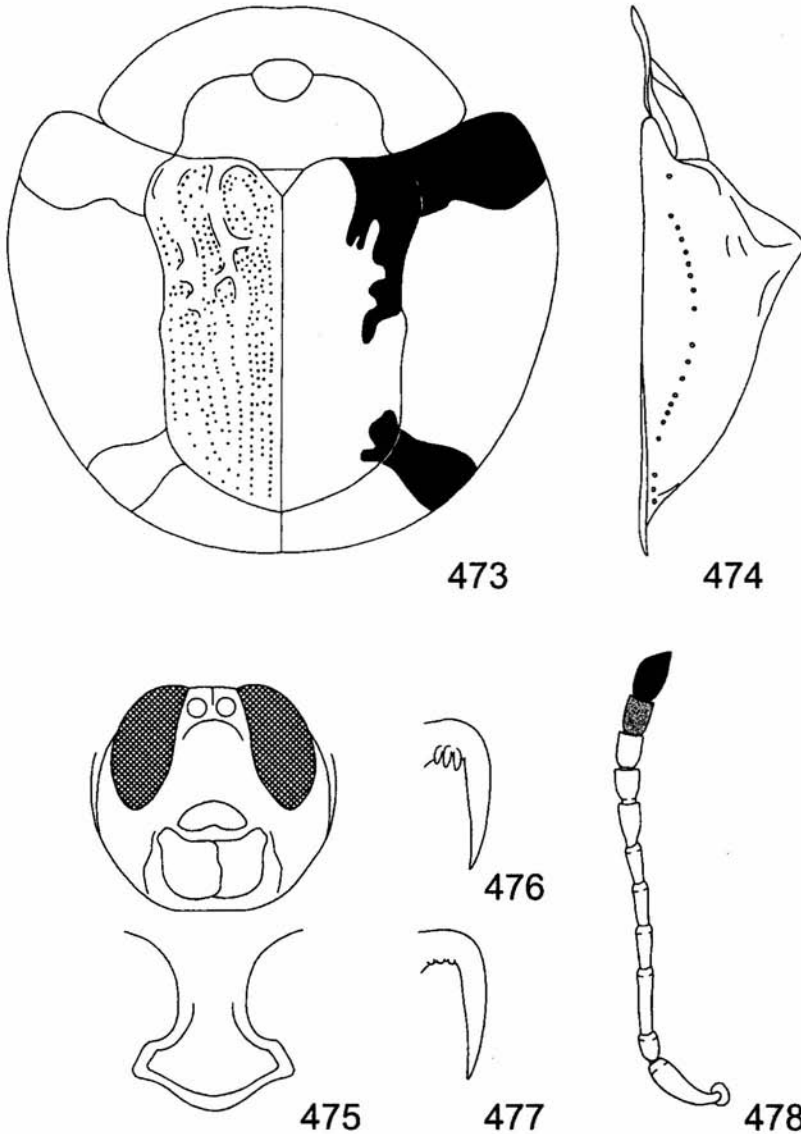
DIAGNOSIS

A member of *A. sanctaecrucis* group. This species and *A. castaneipennis* form a subgroup characterized by very short inner pecten of claws extending at most to 1/4 length of claw. Both species have surface of elytral disc less irregular than the remaining species of group, in particular *A. castaneipennis* is completely smooth in the posterior part. Impressions on elytral disc of *A. ponderosa* are deeper than in *A. castaneipennis*. Postscutellar impression is bordered by distinct fold in *A. ponderosa*, while it is no bordering or only a faint elevation is present in *A. castaneipennis*. Elytra of *A. ponderosa* usually have spots on explanate margin of elytra that are darker than background of disc, and usually a dark spot on humeral callus, while in *A. castaneipennis* spots of explanate margin are the same colour as disc and disc is never spotted. The two species are allopatric: *A. ponderosa* is endemic to Moluccas, while *A. castaneipennis* occupies western part of Sunda Is., Philippines, Malay Peninsula, and Vietnam. *A. tamdaoensis* from Vietnam and *A. lobata* from India, Ceylon, and Bangladesh have also short pecten of claws but differ in irregular surface of elytral disc, puncturation being especially coarse and impressed in *A. tamdaoensis*, with interspaces forming irregular folds. *A. lobata* also differs in

stouter body, with elytral base only slightly wider than pronotum, while in *A. ponderosa* elytral base is distinctly wider than pronotum.

DESCRIPTION

Male: L = 12.4-12.5; W = 11.9-12.6; Lp = 3.8-4.0; Wp = 8.1-8.5; L/W = 0.99-1.04; Wp/Lp = 2.12-2.13; Female: L = 14.5-15.0; W = 14.0-14.5; Lp = 4.6-5.0;



473-478. *Aspidimorpha ponderosa*: 473 - body in dorsal view, 474 - body in lateral view, 475 - head and prosternum, 476 - inner side of claw, 477 - outer side of claw, 478 - antenna

$Wp = 9.1-9.5$; $L/W = 1.03$; $Wp/Lp = 1.90-1.98$. Body circular (fig. 473), sexual dimorphism only slightly marked, males smaller and stouter than females.

Pronotum and scutellum yellowish-brown to reddish brown. Elytral disc yellowish-brown to reddish-brown, usually with two spots: first in anterior part of disc between the fold bordering postscutellar impressions and the border of disc, and second spot on side of disc, close to posterolateral spots on explanate margin. Occasionally, elytral disc monochromatic, without spots. Explanate margin of elytra with humeral and posterolateral spots yellowish-brown to black (fig. 473), and humeral spots usually hammer-shaped. Ventrites and legs yellow. Antennae yellow, two last segments black, or segment 10 brown.

Pronotum elliptical, 1.90-2.13 times wider than long, with maximum width at 1/3 basal length, sides rounded. Disc moderately convex, glabrous, usually dullish, sometimes shiny. Explanate margin glabrous, dullish to shiny.

Elytral base distinctly wider than base of pronotum. Humeral angles almost rightangled. Elytral disc strongly convex with very large, conical postscutellar tubercle (fig. 474) and distinct postscutellar impressions bordered by a high fold, and distinct principal impressions. Puncturation regular, dense, moderately coarse, distinct along the whole length of disc. Punctures in a row tend to groups. Additional irregular punctures often occurs in anterior part of second interval and sometimes in anterior part of fourth interval. Intervals are mostly equal in width, approximately three times wider than punctures. Surface of disc, especially in the anterior part, is slightly irregular, and shows shallow impressions. Explanate margin is glabrous. Whole surface of elytra slightly dull. Apex of elytral epipleura bears erect hairs.

Clypeus 1.5 times wider than long, in the anterior part with a fine impression. Labrum broad and emarginate to 1/3 length. Mandibles with a cutting edge only, without teeth. Prosternal process rhomboidal, moderately wide, with an impression in the middle (fig. 475).

Length ratio of antennal segments: 100: 35: 88: 59: 59: 53: 59: 41: 44: 47: 76, segment 3 approximately 2.5 times longer than segment 2 and approximately 1.5 times than segment 4 (fig. 478).

Claws with short pecten on both sides. Inner pecten with three equal teeth extending only to 1/5 length of claw (fig. 476). Outer pecten with three teeth only slightly extending beyond margin of claw (fig. 477).

Aedeagus slim, slightly widened apically, apex broadly rounded, with small apical process. Apical part strongly curved ventrad. Ventral side without membrane (figs 460, 461).

TYPE MATERIAL

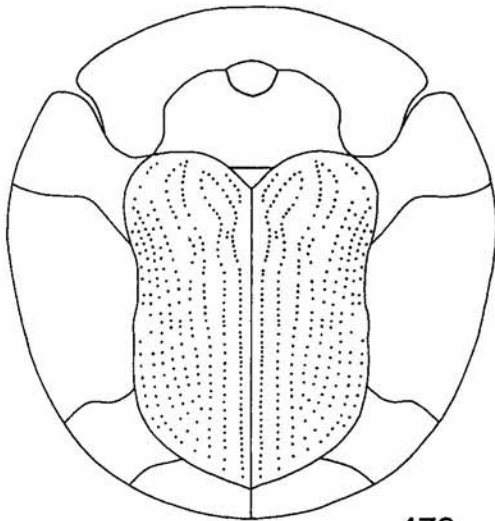
Lectotype: "Amboin" "Type" (NRS) – designated by BOROWIEC (1999).

DISTRIBUTION

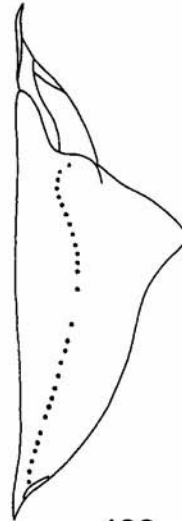
Indonesia: Ambon, Buru, Seram (fig. 203).

***Aspidomorpha (s. str.) quadrilobata* BOHEMAN, 1856**
(figs 448, 4449, 479-487, tab. 10: 9)

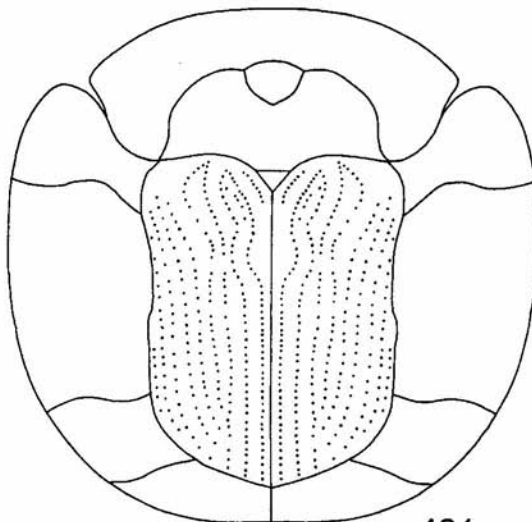
Aspidomorpha quadrilobata BOHEMAN, 1856: 111; 1862: 268; BALY, 1863: 13 (misidentification);
GEMMINGER and HAROLD, 1876: 3650; SPAETH, 1914 e: 69; HAITLINGER, 1996: 989 (parasite).
Aspidomorpha quadrilobata: BOROWIEC, 1996: 12.
Aspidomorpha (Aspidomorpha) quadrilobata: BOROWIEC, 1999: 197.



479



480



481



482

479-482. *Aspidomorpha quadrilobata*: 479, 480 - male, 481, 482 - female; 479, 481 - body in dorsal view, 480, 482 - body in lateral view

DIAGNOSIS

The only member of *A. quadrilobata* group. Mandibles toothless as in *A. sanctaecrucis* group, but *A. quadrilobata* differs in having pronotum with emarginate sides and humeral angles strongly protruding anterad.

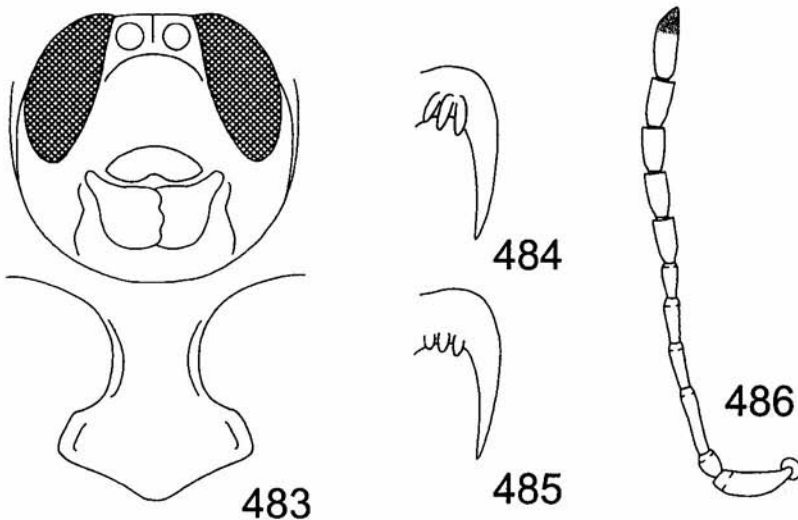
DESCRIPTION

Male: L = 11.3-13.5; W = 11.0-12.5; Lp = 4.0-4.4; Wp = 7.8-9.0; L/W = 1.02-1.08; Wp/Lp = 1.88-2.04; Female: L = 11.9; W = 11.5; Lp = 4.1; Wp = 7.7; L/W = 1.03; Wp/Lp = 1.88. Body slightly trapezoidal (figs 479, 481), male stouter than female, usually with humeral angles more protruding anterad, and with anterior margin of each elytron forms right angle (fig. 479), although some large females have humeral angles as strongly protruding anterad as in males.

Pronotum and scutellum yellowish-brown to reddish brown. Elytral disc uniformly yellowish-brown to reddish-brown. Explanate margin of elytra usually with yellowish-brown to reddish-brown humeral and posterolateral spots, occasionally without spots. Ventrites and legs yellow. Antennae yellow, top of last segments black or infusate, rarely antennae completely yellow.

Pronotum trapezoidal, 1.90-2.13 times wider than long, with maximum width at 1/2 basal length, with distinct lateral angles, sides behind angle usually shallowly emarginate, especially in males. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Elytral base wider than base of pronotum. Humeral angles strongly protrude anterad and surround sides of pronotum. Anterior margin of each elytron forms a distinct obtuse to almost right angle. Elytral disc convex, with large, conical postscutellar tubercle (figs 480, 482), barely marked principal impressions, and

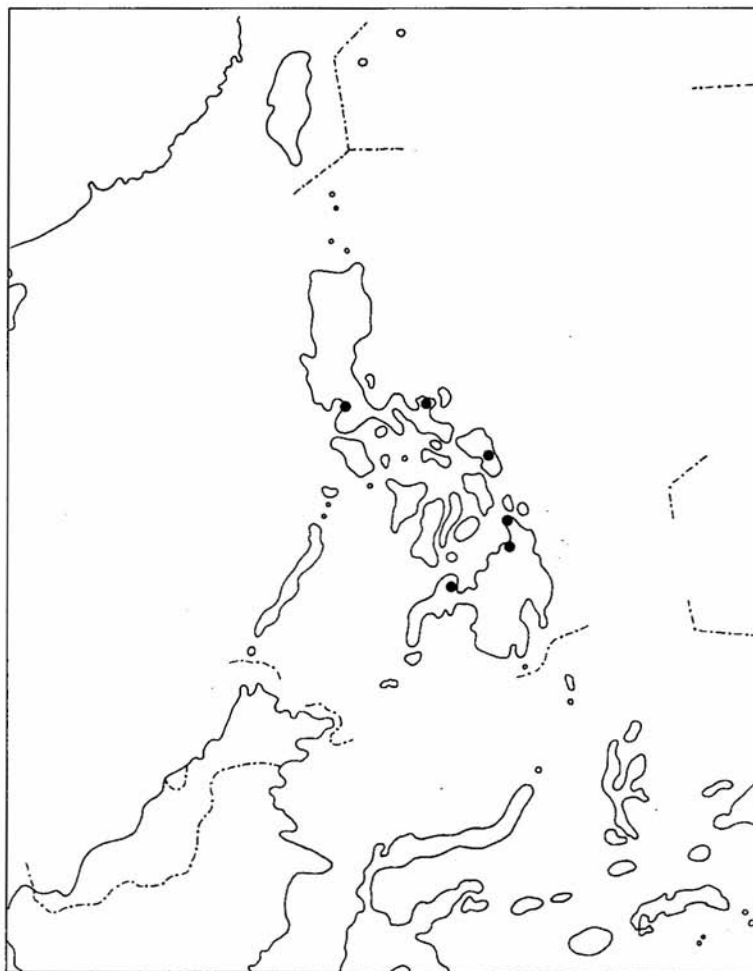


483-486. *Aspidimorpha quadrilobata*: 483 - head and prosternum, 484 - inner side of claw, 485 - outer side of claw, 486 - antenna

without postscutellar and lateral impressions. Puncturation regular, moderately coarse, distinct along the whole length of disc. In anterior part of second interval there is usually a group of additional, irregular punctures. Intervals mostly equal in width, approximately five times wider than punctures. Surface of intervals glabrous and shiny. Surface of disc glabrous. Explanate margin glabrous and shiny. Apex of elytral epipleura with hairs.

Clypeus 1.7 times wider than long, slightly convex. Labrum broad, shallowly emarginate. Mandibles toothless with cutting edge only. Prosternal process rhomboidal, moderately wide, without impression (fig. 483).

Length ratio of antennal segments: 100: 33: 93: 63: 63: 46: 60: 56: 56: 63: 100, segment 3 approximately 2.8 times longer than segment 2 and approximately 1.5 times than segment 4 (fig. 486).



487. Distribution of *Aspidimorpha quadrilobata*

Claws with short pecten on both sides. Inner pecten with three, equal teeth extending to 1/4 length of claw (fig. 484). Outer pecten with three teeth, which reach only slightly beyond margin of claw (fig. 485).

Aedeagus slim, slightly widened apically, apex broadly rounded, with broad and obtuse apical process. Apical part gently curved ventrad. Ventral side without membrane (figs 448, 449).

TYPE MATERIAL

Lectotype: "Manilla" "Brit. Mus." "Type" (NRS) – designated by BOROWIEC (1999).

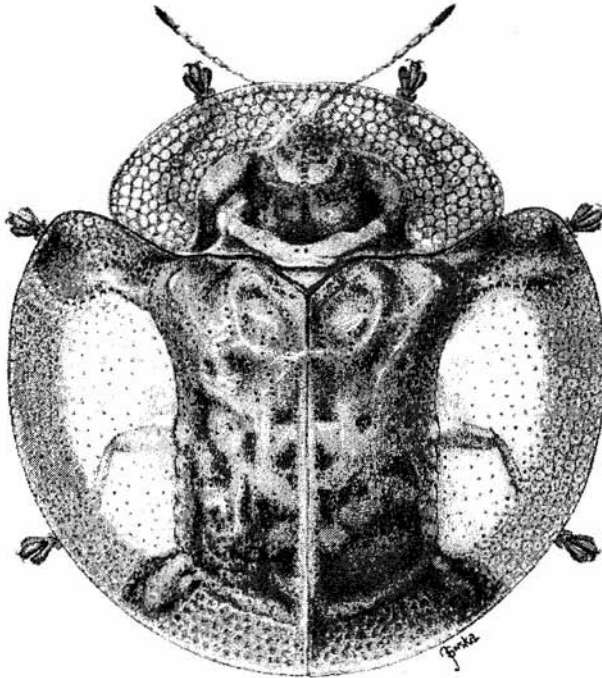
DISTRIBUTION

Philippines: Luzon (fig. 487).

Aspidimorpha (s. str.) *sanctaerucis* (FABRICIUS, 1792)

(figs 453-455, 488-498, tab. 1: 1, 5: 3, 4)

Cassida St. Crucis FABRICIUS, 1792: 450, 1801: 401; HERBST, 1799: 301; ILLIGER, 1806: 227; SCHÖNHERR, 1817: 223; ZIMSEN, 1964: 91.



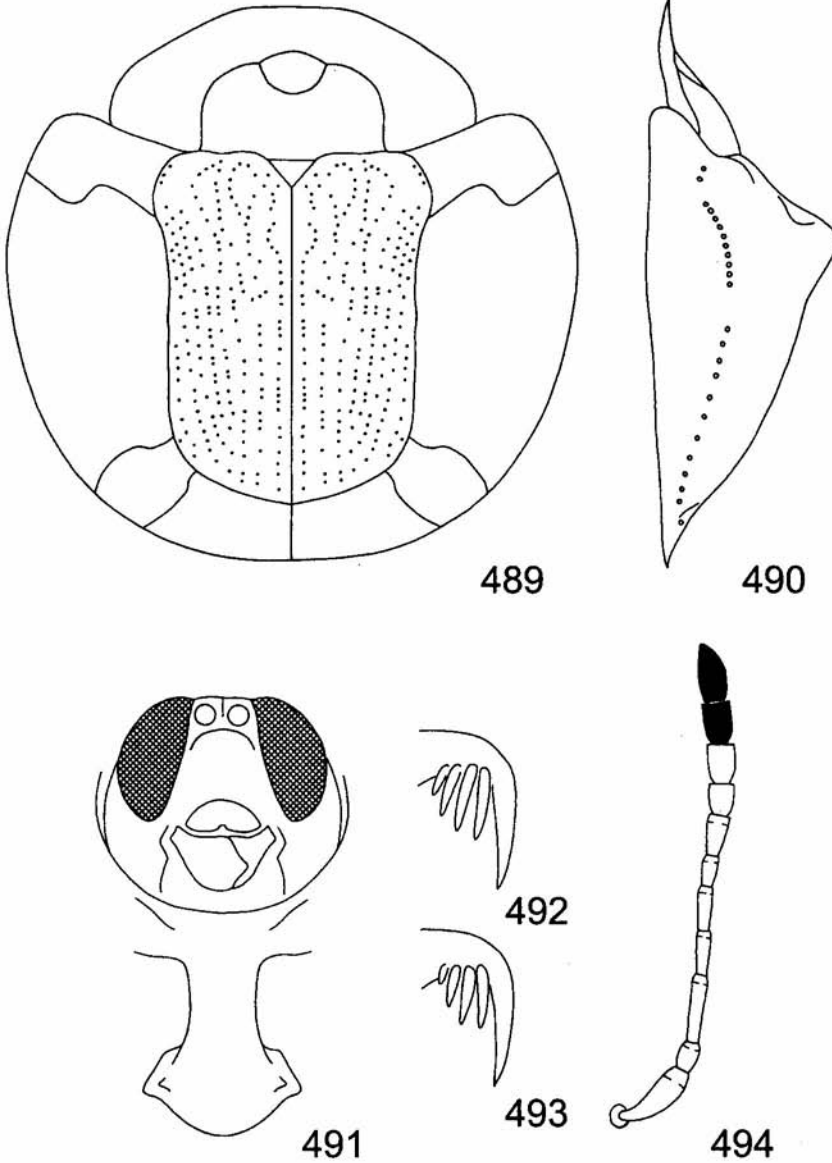
488. *Aspidimorpha sanctaerucis*, habitus

- Aspidomorpha St. Crucis*: BOHEMAN, 1854: 287, 1856: 111, 1862: 267 (*St. taе crucis*); BALY, 1863: 13; MORSBACH, 1865: 114 (*Sanctae crucis*); GEMMINGER and HAROLD, 1876: 3650; MASTERS, 1889: 998; WEISE, 1897: 102 (*St. crucis*); SPAETH, 1900: 23 (*St-Crucis*), 1914 e: 69, 1938: 231; MAULIK, 1916: 586, 1919: 273 (incl. larva, pupa, fig.), 329; SPAETH and REITTER, 1926: 10; GRESSITT, 1938 a: 189, 1938 c: 580, 1939: 140, 1952: 466 (incl. fig., pupa); CHEN and ZIA, 1961: 441; GRESSITT and KIMOTO, 1963: 953 (incl. fig., pupa); WILCOX, 1975: 154; TAKIZAWA, 1980 a: 27 (larva, pupa), 1985 a: 5, 1985 c: 113; KIMOTO, 1981: 57, 1998: 31 (incl. colour photo); MEDVEDEV and DAN, 1982: 95; MEDVEDEV and EROSHKINA, 1982: 105, 106; 1988: 124; LIZHONG, 1982: 54, 1989: 86; YU, 1983: 795 (*sanctae-crucis*), 1986: 683; ZAITSEV and MEDVEDEV, 1983: 144 (larva); BOROWIEC, 1985 a: 26, 1990 a: 688; BASU, 1985: 213; CHEN et al., 1986: 586, 636, pl. XIV (incl. colour fig.); BASU and HALDER, 1987: 237; MEDVEDEV, 1992: 35 (*sanctae-crucis*), 1997: 264; MOHAMEDSAID, 1993: 46 (colour photo), 2000 a: 359; KIMOTO et al., 1995: 106 (incl. photo); HAITLINGER, 1996: 985, 988 (parasites); REID, 1998: 303; MEDVEDEV and SPRECHER-UEBERSAX, 1999: 348.
- Aspidomorpha Sanctae-Crucis* [sic]: DUVIVIER, 1891: 50.
- Aspidomorpha sanctaе crucis*: BOROWIEC, 1996: 12.
- Aspidomorpha (Aspidomorpha) sanctaе crucis*: BOROWIEC, 1999: 198.
- Aspidomorpha sactaе crucis* [sic]: MOHAMEDSAID, 2000 b: 375.
- Aspidomorpha st. crucis* var. *insularis* SPAETH, 1912 d: 118.
- Aspidomorpha sanctaе crucis* ssp. *insularis*: SPAETH, 1914 e: 70.
- Aspidomorpha sanctae crucis* ssp. *insularis*: SPAETH, 1926 c: 117.
- Cassida jamaicensis*: OLIVIER, 1790: 386, 1808: 952; HERBST, 1799: 303, not LINNAEUS, 1758; SPAETH, 1914 e: 69 (as syn. of *sanctaе crucis*).
- Aspidomorpha bajula* BOHEMAN, 1854: 288, 1856: 111, 1862: 267; GEMMINGER and HAROLD, 1876: 3648; SPAETH, 1914 e: 69 (as syn. of *sanctaе crucis*); BOROWIEC, 1990 a: 685 (as syn. of *lobata*).
- Aspidomorpha fraterna* BALY, 1863: 11, 13; GEMMINGER and HAROLD, 1876: 3649; WEISE, 1897: 103 (as syn. of *sanctaе crucis*).
- Aspidomorpha sanctaе crucis* var. *fraterna*: SPAETH, 1914 c: 70.
- Aspidomorpha sanctae-crucis fraterna*: GRESSITT, 1939: 140.
- Aspidomorpha orientalis* Dej.: GEMMINGER and HAROLD, 1876: 3650 (nomen nudum).

DIAGNOSIS

The most common and variable species of the *A. sanctaе crucis* group. Typical specimens, with well developed spots on marginalia are similar to *A. birmanica*, *A. lobata*, *A. stevensi*, *A. bataviana*, and *A. tamdaoensis*. *A. birmanica* is distinctly slimmer (L/W 1.15-1.25, in *sanctaе crucis* 0.97-1.14). *A. lobata* has distinctly shorter pecten of tarsal claws, extending at most to 1/3 length of claw (in *sanctaе crucis* to 2/5-1/2 length), it is also stouter, with elytral base less wider than base of pronotum, and surface of elytra less irregular than in *A. sanctaе crucis*, with sparser puncturation. *A. bataviana* is very similar and looks like a miniature of *A. sanctaе crucis*; it is usually less than 10.5 mm long (only the largest specimens reach 11.5 mm), while in *A. sanctaе crucis* body length is usually above 11.5 mm (only the smallest males can be smaller, up to 10.5 mm). *A. stevensi* differs in shorter antennae, with third segment only twice as long as the second, while in *A. sanctaе crucis* it is at least 2.3 times as long as the second segment. Elytral surface of *A. stevensi* is more regular, with sparser puncturation and less impressions. The most similar is *A. tamdaoensis* but it distinctly differs in prosternal collar and anterior half of prosternal process densely pubescent, and pecten of claws shorter, extending at most to 1/4 length of claw. Untypical forms of *A. sanctaе crucis*, with partly reduced spots on marginalia, can be difficult to

distinguish from *A. elevata* and large specimens of *A. bataviana*, but all three species are mostly allopatric (see remarks to *A. sanctaecrucis* and *A. elevata*). *A. ponderosa* and *A. castaneipennis* are similar in body size and colouration but differ in more regular elytral surface and very short pecten of claws, extending at most to 1/4 length of claw. Rare specimens of *A. malaccana*, with reduced elytral



489-494. *Aspidimorpha sanctaecrucis*: 489 - body in dorsal view, 490 - body in lateral view, 491 - head and prothorax, 492 - inner side of claw, 493 - outer side of claw, 494 - antenna

pattern, are also similar but their punctures of elytra are marked with black, especially on sides of disc, while in *A. sanctaerucis* punctures are always without dark marking (except ab. *insularis* from Borneo).

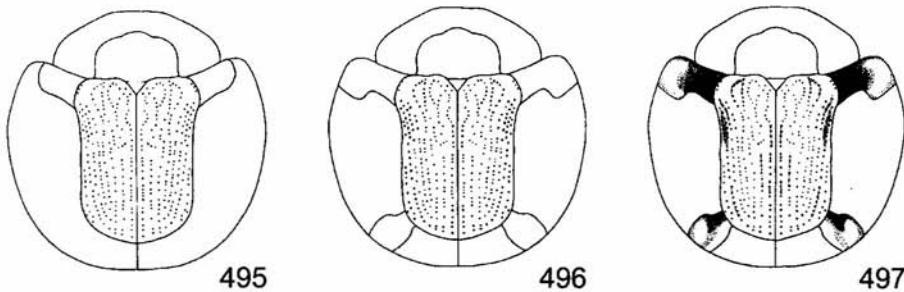
DESCRIPTION

L = 10.0-14.9; W = 9.8-14.1; Lp = 3.3-4.6; Wp = 6.2-9.8; L/W = 0.99-1.10; Wp/Lp = 1.88-2.14. Body circular (fig. 489), sexual dimorphism indistinct, males usually slightly smaller and stouter than females.

Pronotum and scutellum yellow to yellowish-brown, rarely reddish-brown. Elytral disc monochromatic yellow, yellowish-red to yellowish-brown (figs 495, 496). In typical forms explanate margin of elytra with reddish-brown humeral and posterolateral spots; humeral spots usually hammer-shaped, often with small yellow window close to humeral angle (fig. 496). In forms from Borneo spots on marginalia are often partly or completely black, especially on underside of explanate margin, sometimes area of disc below humeral callus also is black (fig. 497). In form from Hainan posterolateral spots are often absent and humeral spots partly reduced to diagonal spot extending at most to half width of marginalia (fig. 495). The ab. *fraterna* from Indochina also has reduced posterolateral spots and humeral spots often not hammer-shaped; the "*fraterna*" forms are always females and may be rare hybrids of *A. sanctaerucis* with other species of the genus. Ventrites yellow to yellowish-brown. Legs yellow. Antennae yellow, two last segments black.

Pronotum elliptical, 1.88-2.14 times wider than long, with maximum width in 2/5 basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Elytral base distinctly wider than base of pronotum. Humeral angles slightly protruding anterad, broadly rounded. Elytral disc strongly convex, with large, conical postscutellar tubercle (fig. 490), with distinct, bordered by fold postscutellar impressions, and with principal and lateral impressions. Sometimes each lateral impression is split into two small impressions. Puncturation moderately coarse, distinct along the whole length of disc. Punctures tend to group; elytral folds often disturb the regularity of rows. Additional, irregular punctures often occur in anterior part of second interval. Intervals mostly equal in width, approxi-



495-497. *Aspidimorpha sanctaerucis*: variation of dorsal pattern

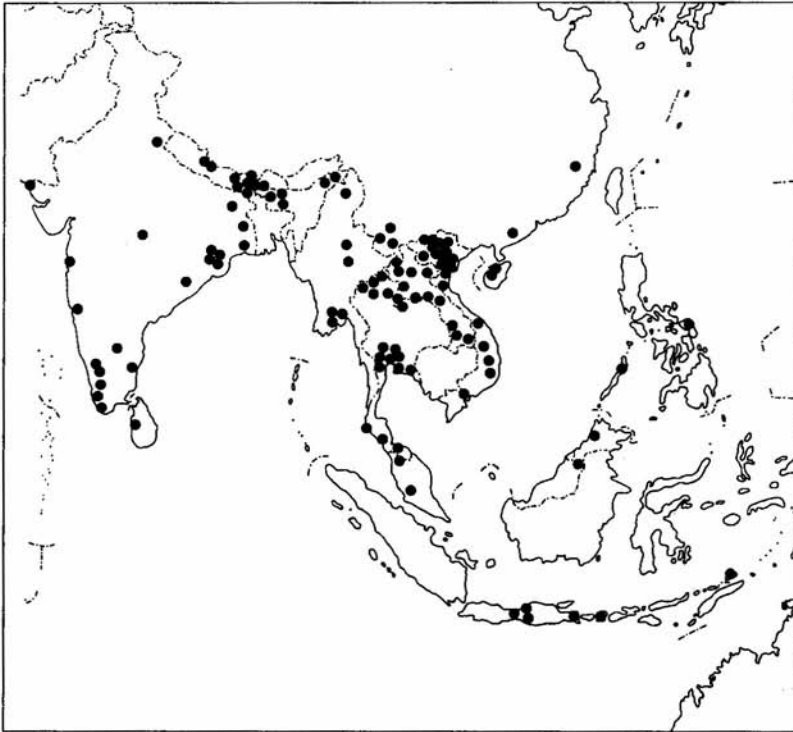
mately three times wider than punctures. Surface of intervals smooth and usually glabrous. Surface of elytra more or less irregular, the most irregular in populations from Himalaya, Assam, and N Vietnam, the most regular in populations from Hainan and Borneo. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with long, erect hairs.

Clypeus approximately 1.4 times wider than long, usually with a shallow impression in the middle. Labrum broad, shallowly emarginate to $1/3-2/5$ length. Mandibles toothless with cutting edge only, without teeth. Prosternal process rhomboidal, moderately wide, with a fine impression in the middle (fig. 491).

Length ratio of antennal segments: 100: 35: 88: 59: 59: 41: 53: 41: 50: 55: 82, segment 3 approximately 2.5 times longer than segment 2 and approximately 1.5 times than segment 4 (fig. 494).

Claws with distinct pecten on both sides. Inner pecten usually with three teeth in anterior legs, and four teeth in middle and hind legs (fig. 492). In most populations inner pecten extends to $1/2-2/3$ length of claw, in some populations (especially from Assam and N Vietnam) only to $2/5$ length of claw. Outer pecten with three or four teeth, extending to $1/3-1/2$ length of claw (fig. 493).

Aedeagus slim, slightly widened apically, apex broadly rounded, with small, obtuse apical process, in specimens from Borneo aedeagus sometimes without



498. Distribution of *Aspidimorpha sanctaerucis*

apical process. Apical part moderately curved ventrad. Ventral side with distinct, longitudinally striated membrane (figs 453-455).

HOST PLANT

Convolvulaceae: *Ipomoea* sp. (GRESSITT 1952; TAKIZAWA 1980, 1985 a; MEDVEDEV et DAN 1982).

TYPE MATERIAL

Cassida sanctaerucis: 2 syntypes: "America insulis" "401.80" (ZMK).

Aspidomorpha bajula: holotype: "America?" "Mhn" "Type" (NRS).

Aspidomorpha sanctaerucis var. *insularis*: syntype: "Sumatra, cotypus" (MM); 2 syntypes: "Lawas Aug. 24 1909" "Sarawak Moulton" "cotyp" (MM); syntype: "S. O. Borneo, cotyp" (MM).

Aspidomorpha fraterna: holotype: "Cambodja" "Type" (BMNH).

DISTRIBUTION

Bhutan; Burma; Cambodja; Ceylon; China: Fujian, Guangdong, Guangxi, Hainan, Sichuan, Yunnan; India; Indonesia: Borneo, Java, Seram, Sumatra; Laos; Malaysia; Nepal; Pakistan: Karachi; Philippines: Samar (?introduced); Sikkim; Thailand; Vietnam (fig. 498).

REMARKS

It is extremely variable species. Relationships between *A. sanctaerucis*, *A. elevata*, and *A. bataviana* need detailed genetic and bionomical studies. It is possible that these taxa partly crossbreed, because some of the examined specimens have intermediate characters, e.g. *A. fraterna* described from Indochina is intermediate between *A. sanctaerucis* and *A. elevata* and all studied "*fraterna*" phenotypes were females (chrysomelid beetles hybrids often are parthogenetic). The mountain populations of *A. sanctaerucis* from Assam are distinctly larger, and have stronger elytral sculpture but slightly shorter pectens on claws than lowland populations. It is also possible that *A. sanctaerucis*, *A. elevata*, and *A. bataviana* are vicariant species or, as suggested by several authors, geographic forms of the same species. Intermediate specimens were collected in the overlapping part of the areas in Thailand and Malaysia, but it is difficult to say whether it was a result of crossing. I have observed also a tendency to reduce of spots on the marginalia, which is typical of *A. elevata*, in populations of genuine *A. sanctaerucis* from the Hainan Is., which may be a result of genetic drift. Females of this insular form are very difficult to distinguish from females of *A. elevata*. Maculate forms of *A. sanctaerucis* (described as var. *insularis*) occurs in Borneo where typical *A. elevata* is absent (although it is common on neighbouring Sunda Is.), while typical specimens of *A. sanctaerucis* were collected on Java and Sumatra (although in a small number) where *A. elevata* is one of the most common species of the genus. Also are unclear relationships between *A. sanctaerucis* and *A. bataviana*. *A. bataviana* differs from *A. sanctaerucis* only in size and looks like its miniature. Both are sympatric in Borneo (where, however, *A. bataviana* is rare)

but I did not find intermediates from this island. By contrast on Java, where *A. bataviana* is sympatric with an as common as *A. elevata*, I found intermediate specimens between these taxa.

***Aspidomorpha* (s. str.) *sarasinorum* SPAETH, 1932**

(figs 370-371, 499-504, tab. 7: 5)

Aspidomorpha sarasinorum SPAETH, 1932 a: 199.

Aspidomorpha (*Aspidomorpha*) *sarasinorum*: BOROWIEC, 1999: 199.

DIAGNOSIS

A very distinct species. A member of *A. sanctaecrucis* group but differs from all species of the group in circular body, with elytral base only slightly wider than pronotum. Its elytral pattern is unique.

DESCRIPTION

Male: L = 10.8; W = 10.5; Lp = 3.8; Wp = 7.4; L/W = 1.03; Wp/Lp = 1.95. Body circular (fig. 499), no sexual dimorphism.

Pronotum and scutellum yellow. Elytral disc yellow with dark brown to black spot on humeral callus extending from elytral base to 2/5 length of disc, and broad transverse band in posterior part of disc. Explanate margin of elytra without spots. Ventrites and legs yellow. Antennae yellow, last segment black, penultimate segment yellow at the base and black apically.

Pronotum elliptical, approximately twice wider than long, with maximum width in 1/2 basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

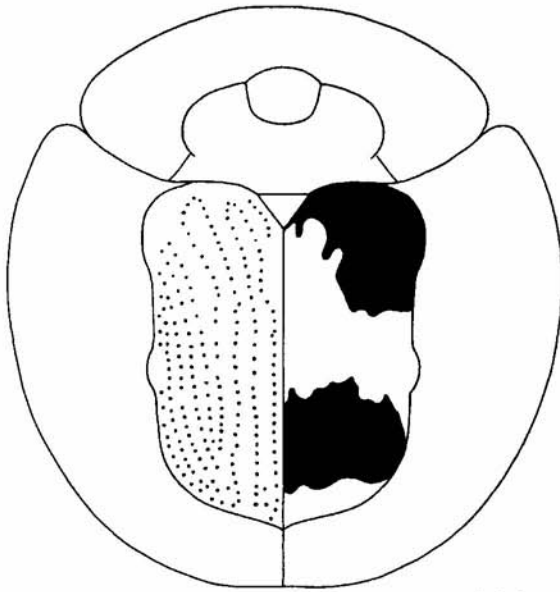
Elytral base only slightly wider than base of pronotum. Humeral angles angulate, moderately protruding anterad. Elytral disc convex, with large, conical postscutellar tubercle (fig. 500), shallow principal impressions, and without postscutellar and lateral impressions. Puncturation regular, moderately coarse, distinct along the whole length of disc. Intervals mostly equal in width, approximately four times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with distinct, erect, hairs.

Clypeus approximately 1.5 times wider than long, slightly convex. Labrum broad, emarginate to 1/3 length. Mandibles toothless with cutting edge only. Prosternal process rhomboidal, moderately wide, without impression (fig. 501).

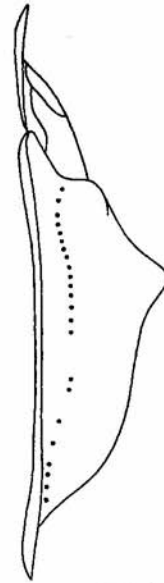
Length ratio of antennal segments: 100: 46: 100: 66: 73: 53: 66: 66: 80: 80: 120, segment 3 approximately 2.1 times longer than segment 2 and approximately 1.5 times than segment 4 (fig. 504).

Claws with very short pecten on both sides. Inner pecten with four teeth only slightly extending beyond margin of claw (fig. 502). Outer pecten with two teeth only slightly extending beyond margin of claw (fig. 503).

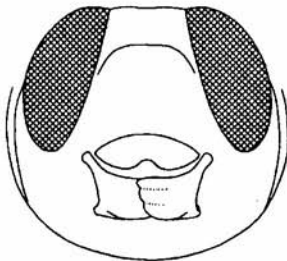
Aedeagus slim, slightly widened apically, apex broadly rounded, with truncate apical process. Apical part gently curved ventrad. Ventral side without membrane (fig. 370, 371).



499



500



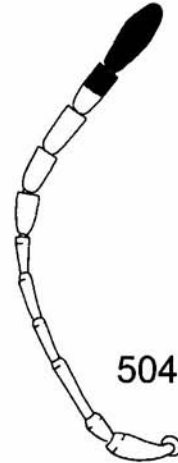
501



502



503



504

499-504. *Aspidimorpha sarasinorim*: 499 - body in dorsal view, 500 - body in lateral view, 501 - head and prothorax, 502 - inner side of claw, 503 - outer side of claw, 504 - antenna

TYPE MATERIAL

Holotype: "Celebes, Luwu, Kalaena Gbg. 4 XI 1885, Dr. Sarasin" (NMB).

DISTRIBUTION

Indonesia: Sulawesi (fig. 319).

***Aspidomorpha* (s. str.) *sarawacensis* SPAETH, 1904**

(figs 261, 456, 457, 505-511, tab. 7: 4)

Aspidomorpha sarawacensis SPAETH, 1904: 73; 1912 d: 117, 1914 e: 70; BOROWIEC, 1990 a: 689.

Aspidomorpha (*Aspidomorpha*) *sarawacensis*: BOROWIEC, 1999: 199.

DIAGNOSIS

A member of *A. sanctaerucis* group. *A. sarawacensis* differs from all species of the group in elytral disc without postscutellar tubercle. Specimens of *A. miliaris* without pattern on elytral disc are similar at first glance to *A. sarawacensis*, but *A. miliaris* always has black anterior margin of explanate margin of elytra (in *A. sarawacensis* it is of the same colour as the surface of marginalia), and its elytral disc is densely punctured, with punctures arranged in distinct rows, while in *A. sarawacensis* puncturation of disc is so sparse as to appear irregular. Both species distinctly differ in structure of mouth part, *A. sarawacensis* has mandibles without teeth, as all species of *A. sanctaerucis* group, while *A. miliaris* has distinctly toothed mandibles.

DESCRIPTION

Male: L = 10.2-10.5; W = 10.1-10.7; Lp = 2.9-3.2; Wp = 6.2-6.3; L/W = 0.98-1.01; Wp/Lp = 1.97-2.14; Female: L = 12.3-13.3; W = 12.5-13.0; Lp = 3.3-3.8; Wp = 7.1-7.5; L/W = 0.98-1.02; Wp/Lp = 1.87-2.27. Body very broad (fig. 505, 506), sexual dimorphism distinct, male distinctly smaller than female.

Pronotum and scutellum yellow to yellowish-brown. Elytral disc uniformly yellow to yellowish-brown. Explanate margin of elytra without spots. Ventrites and legs yellow. Antennae yellow, three last segments black, sometimes 9th segment dark-brown to black only in apical part.

Pronotum elliptical, 1.87-2.27 times wider than long, with maximum width in 1/3 basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

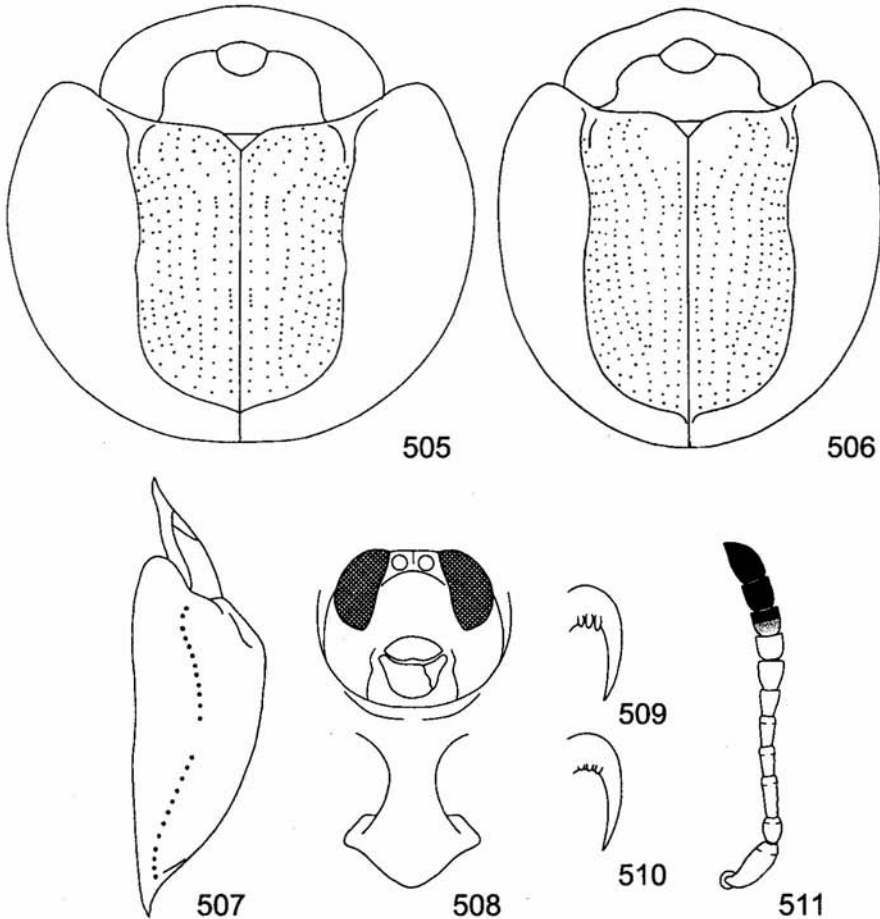
Elytral base distinctly wider than base of pronotum. Humeral angles broadly rounded. Elytral disc regularly convex with top of convexity in postscutellar point, without postscutellar tubercle (fig. 507), with shallow postscutellar impressions, and distinct principal impressions. Puncturation regular, moderately coarse, distinct along the whole length of disc. Additional, sparse, irregularly disposed punctures are sometimes present in anterior part of second interval. Intervals mostly equal in width, approximately five times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with hairs.

Clypeus 1.5 times wider than long, with distinct impression in the middle. Labrum broad, shallowly emarginate to 1/5 length. Mandibles toothless with cutting edge only. Prosternal process rhomboidal, moderately wide, with broad, elongate impression (fig. 508).

Length ratio of antennal segments: 100: 41: 70: 50: 53: 41: 50: 41: 44: 53: 85, segment 3 approximately 1.7 times longer than segment 2 and approximately 1.4 times than segment 4 (fig. 511).

Claws with very short pecten on both sides. Inner pecten with three teeth extending to 1/6 length of claw (fig. 509). Outer pecten with three teeth only slightly extending beyond margin of claw (fig. 510).

Aedeagus slim, slightly widened apically, apex broadly rounded, with obtuse apical process. Apical part gently curved ventrad. Ventral side without membrane (figs 456, 457).



505-511. *Aspidimorpha sarawacensis*: 505, 506 - body in dorsal view (505 - male, 506 - female), 507 - body in lateral view, 508 - head and prosternum, 509 - inner side of claw, 510 - outer side of claw, 511 - antenna

TYPE MATERIAL

Syntype: "Borneo, Sarawak" "Type" (MM); 2 syntypes: "Borneo Sarawak, 1863-66, coll. G. Doria" (MCSNG).

DISTRIBUTION

Malaysia: continental: Cameron Highlands, Borneo: Sabah, Sarawak (fig. 261).

***Aspidimorpha* (s. str.) *snizeki* n. sp.**

(figs 359, 360, 512-517, tab. 13: 3)

ETYMOLOGY

Dedicated to the Czech collector M. SNIZEK, who sent me many interesting Oriental cassids.

DIAGNOSIS

A member of *A. indica* group. Similar also to specimens of *A. furcata* possessing both humeral and posterolateral spots on explanate margin of elytra. The most similar to *A. snizeki* are *A. indica* and *A. difformis*. *A. indica* differs in having distinctly higher and more angulate postscutellar tubercle, and longer pecten on claws, extending to half length of claw at least on mid and hind claws; Puncturation of elytral disc is slightly coarser but sparser in *A. indica* than in *A. snizeki*, with punctures in posthumeral part distinctly coarser than in central part of disc. *A. difformis* differs in sparser but coarser puncturation of elytra and longer pecten of claws, its northern populations also differ in distinctly lower postscutellar tubercle. The best distinguishing character is structure of aedeagus, which in *A. difformis* has its apical part strongly bent ventrad, almost at a right angle with to stem of penis, while in *A. snizeki* apical part of aedeagus is gently curved ventrad. Forms of *A. furcata* with both humeral and posterolateral spots on explanate margin of elytra differ in more angulate postscutellar tubercle and spoon-like aedeagus.

DESCRIPTION

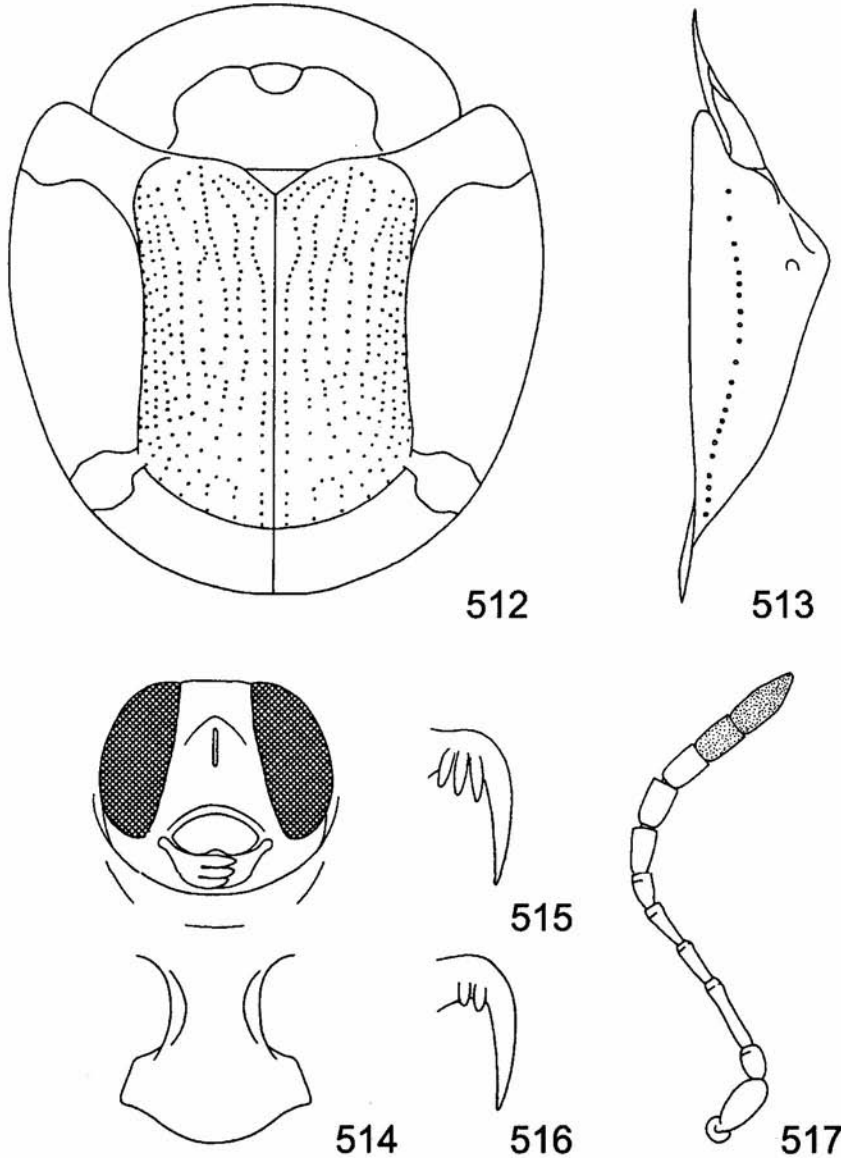
Male: L = 8.15, W = 7.2, Lp = 2.5, Wp = 5.1, L/W = 1.13, Wp/Lp = 2.04. Body broadly-oval (fig. 512), sexual dimorphism unknown, the only examined specimen is male.

Pronotum and scutellum yellow. Elytral disc yellow, punctures without areolae, only marginal row brown marked. Explanate margin of elytra with brown humeral and posterolateral spots (fig 512). Ventrites and legs yellow. Antennae yellow, two last segments infuscate.

Pronotum elliptical, 2.04 times wider than long, with maximum width in 1/3 basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Elytral base wider than base of pronotum. Humeral angles rounded, slightly protrude anterad. Elytral disc convex with conical but obtuse postscutellar tuber-

cle (fig. 513), with well marked principal impression, and without postscutellar and lateral impressions. Punctuation regular, fine, slightly finer but denser than in related species of *indica* group; especially in first, second, and submarginal rows punctures are more numerous than in *A. indica* and *A. difformis*. Punctuation



512-517. *Aspidimorpha snizeki*: 512 - body in dorsal view, 513 - body in lateral view, 514 - head and prosternum, 515 - inner side of claw, 516 - outer side of claw, 517 - antenna

in submarginal row behind humeral callus is as fine as on central part of disc. Intervals mostly equal in width, approximately four to five times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with sparse hairs.

Clypeus 1.3 times wider than long, slightly elevated at base of antennae, with elongate impression in the middle, close to the top. Labrum broad, emarginate to 1/6 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 514).

Length ratio of antennal segments: 100: 54: 123: 77: 77: 62: 77: 77: 69: 77: 123, segment 3 approximately 2.3 times longer than segment 2 and approximately 1.6 times than segment 4 (fig. 517).

Claws with distinct pecten on both sides. Inner pecten with three teeth extending to 2/5 length of claw (fig. 515), outer pecten with two teeth extending to 1/4 length of claw (fig. 516).

Aedeagus slim, slightly narrowed basally, apex broadly rounded, with broad and obtuse apical process. Apical part gently curved ventrad. Ventral side without membrane (figs 359, 360).

TYPE MATERIAL

Holotype: "CHINA-Guizhou, 60 km N of Kaili, Shibing-Yuntai Shan, 21-26 V 1995, E. Jendek & O. Šauša" (LB).

DISTRIBUTION

China: Guizhou.

Aspidomorpha (s. str.) *stevensi* BALY, 1863 *bona* sp.

(figs 338, 518-523, tab. 6: 4)

Aspidomorpha Stevensi BALY, 1863: 11, 13; GEMMINGER and HAROLD, 1876: 3651; BOROWIEC, 1990 a: 689; MOHAMEDSAID, 2000 a: 359.

Aspidomorpha stevensi: BOROWIEC, 1996: 13.

Aspidomorpha (Aspidomorpha) stevensi: BOROWIEC, 1999: 200.

Aspidomorpha sanctaecrucis ssp. ?*Stevensi*: SPAETH, 1914 e: 70.

Aspidomorpha yunnana CHEN et ZIA, 1964: 132; CHEN et al., 1986: 588, 636, pl. XIV (incl. colour fig.); BOROWIEC, 1990 a: 689 (as syn. of *stevensi*); KIMOTO et al., 1995: 106 (in syn. of *sanctaecrucis*).

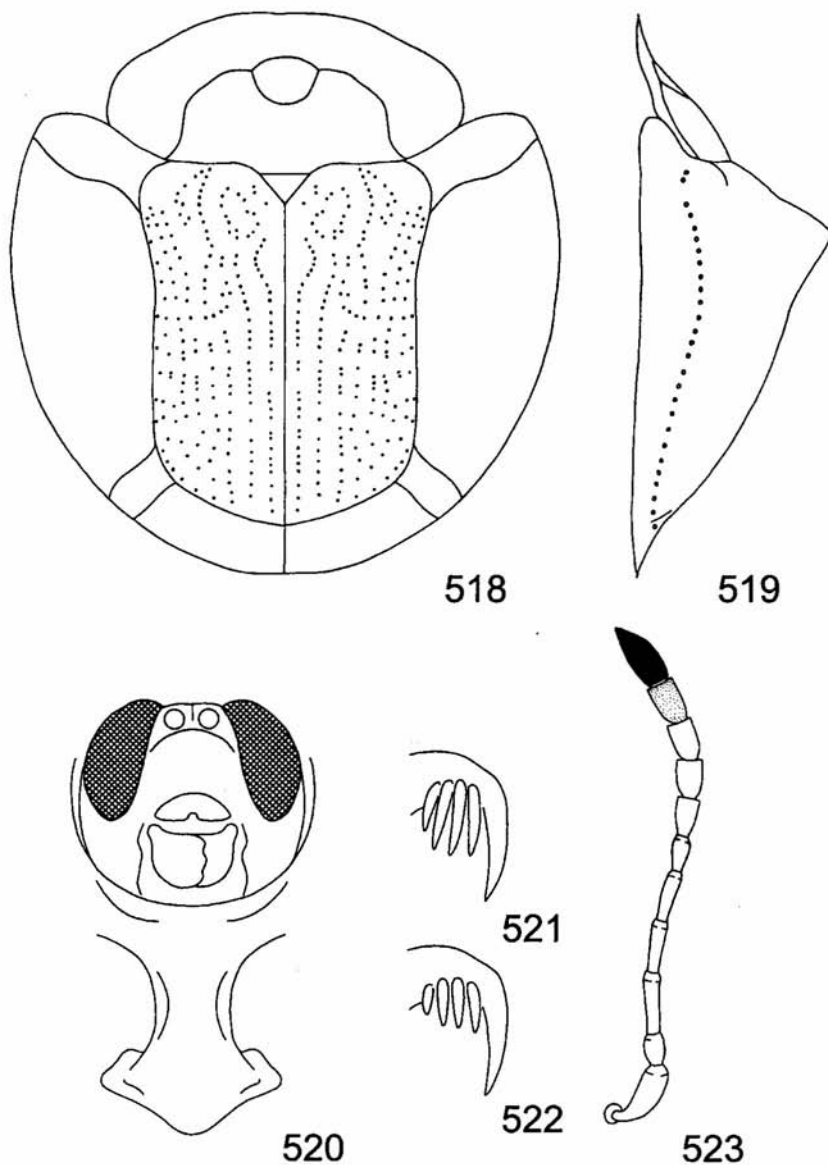
Aspidomorpha yunnanica [sic]: CHEN et ZIA, 1964: 138.

Aspidomorpha vietnamica MEDVEDEV et EROSHKINA, 1982: 113, 105, 106; 1988: 124; MEDVEDEV and DAN, 1982: 95; ZAITSEV and MEDVEDEV, 1983: 143 (larva); BOROWIEC, 1990 a: 689 (as syn. of *stevensi*); ZAITSEV, 1992: 179 (pupa).

DIAGNOSIS

A member of *A. sanctaecrucis* group. In complete spots on explanate margin of elytra and long inner pecten of claws similar to *A. birmanica*, *A. lobata*, and *A. bataviana*. *A. birmanica* is distinctly slimmer, with L/W 1.15-1.25 (in *A. stevensi* 0.97-1.14), and has very irregular surface of elytral disc (which is

smooth in *A. stevensi*). *A. lobata* appears stouter and has distinctly shorter inner pecten of claws, extending at most to 1/3 length of claw (in *A. stevensi* to 2/5-1/2), elytral base in *A. lobata* is narrower than base of pronotum, and surface of elytral disc slightly irregular (but not as irregular as in *A. birmanica*). *A. bataviana* is usually distinctly smaller and with irregular surface of its elytral



518-523. *Aspidimorpha stevensi*: 518 - body in dorsal view, 519 - body in lateral view, 520 - head and prosternum, 521 - inner side of claw, 522 - outer side of claw, 523 - antenna

disc. None of relatives have infusate sutural margin of elytra. *A. sanctaecrucis* has distinctly longer antennae with third segment above 2.3 times longer than the second, while in *A. stevensi* third segment is at most twice longer than the second. *A. castaneipennis* and *A. ponderosa* (of the same group) distinctly differ in very short inner pecten of claws extending at most to 1/4 length of claw. Rare specimens of *A. malaccana* with reduced pattern on elytral disc are similar to *A. stevensi*, but *A. malaccana* differs in slightly irregular surface of elytral disc. At last, *A. tamdaoensis* differs in more sculptured elytra and densely pubescent prosternal collar.

DESCRIPTION

L = 10.4; W = 9.9; Lp = 3.4; Wp = 6.4; L/W = 1.05; Wp/Lp = 1.88. Body circular (fig. 518), sexual dimorphism is unknown, all examined specimen were females.

Pronotum and scutellum yellowish-brown. Elytral disc uniformly yellowish-brown, only apical part of sutural margin infusate. Explanate margin of elytra with complete humeral and posterolateral spots, uniformly wide or slightly narrowed apically, but never hammer-shaped. Ventrites and legs yellow. Antennae yellow, last segment black, sometimes penultimate segment partly infusate.

Pronotum elliptical, 1.9 times wider than long, with maximum width in 1/3 basal length, sides rounded. Disc slightly convex, glabrous and shiny. Explanate margin glabrous and shiny.

Elytral base distinctly wider than base of pronotum. Humeral angles slightly protruding anterad, almost rightangled. Elytral disc strongly convex, with large, conical postscutellar tubercle (fig. 519), barely marked postscutellar impressions, distinct principal impressions, and without lateral impressions. Puncturation moderately coarse, regular, distinct along the whole length of disc. Additional, irregularly disposed punctures in anterior part of second and fourth intervals. Intervals mostly equal in width, approximately three times wider than punctures. Surface of intervals glabrous and shiny, without folds, looks almost regular or only slightly irregular. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with hairs.

Clypeus 1.7 times wider than long, slightly impressed. Labrum broad, emarginate to 1/3 length. Mandibles toothless, with cutting edge only. Prosternal process rhomboidal, moderately wide, not impressed apically (fig. 520).

Length ratio of antennal segments: 100: 43: 87: 75: 75: 50: 56: 53: 56: 56: 100, segment 3 approximately twice longer than segment 2 and only 1.2 times than segment 4 (fig. 523).

Claws with distinct pecten on both sides. Inner with four teeth, extending to 2/3 length of claw (fig. 521), outer pecten also with four teeth extending to half length of claw (fig. 522).

Aedeagus not examined, only female specimens were available.

HOST PLANT

Convolvulaceae: Ipomoea sp. (MEDVEDEV et DAN 1982).

TYPE MATERIAL

Aspidomorpha stevensi: holotype: "Cambodja" "BALY coll." "Type" (BMNH).

Aspidomorpha yunnana: holotype: "[label with Chinese words]" (ASB).

Aspidomorpha vietnamica: paratype: "7. Vietnam, Prov. Daklak, ca. 40 km NW of Buon Ma Thuot, Buon YU Wam, 450 m, 2-3.V.1986, leg. L. Medvedev, S. Golovatch et al." "Paratypus" (LB); paratype: SRV Prov., Gialai-Contum, Ha-Nung, 50 km N Ankne, 17 VI 1980" "*Ipomoea (Convolvulaceae)*" "paratypus" (MNHN).

DISTRIBUTION

Cambodja; China: Yunnan; Thailand; N Vietnam (fig. 338).

REMARKS

KIMOTO et al. (1995) synonymized *A. stevensi* with *A. sanctaerucis*, but these two species differ not only in adult characters but also in the morphology of larvae (ZAITSEV i MEDVEDEV 1983).

***Aspidomorpha (s. str.) suavis* SPAETH, 1912**

(figs 319, 462-464, 524-529, tab. 8: 7)

Aspidomorpha suavis SPAETH, 1912: 118, 1914 e: 70.

Aspidomorpha (Aspidomorpha) suavis: BOROWIEC, 1999: 200.

DIAGNOSIS

A member of *A. dorsata* group. Body shape and broad spots on explanate margin of elytra are similar as in *A. castaneipennis* from *A. sanctaerucis* group, but *A. castaneipennis* is distinctly larger and has mandibles without teeth. The most similar species are *A. intermedia*, *A. subcruciata* from the Philippines, and *A. pacalis* from Tenimber. *A. suavis* differs from its relatives in distinct brownish pattern on elytral disc, while elytral disc of *A. intermedia* and *A. subcruciata* is uniformly yellow or with barely marked yellowish-red pattern. *A. pacalis* also differs in slimmer elytra, abruptly converging posterad, and distinctly marked humeral angles.

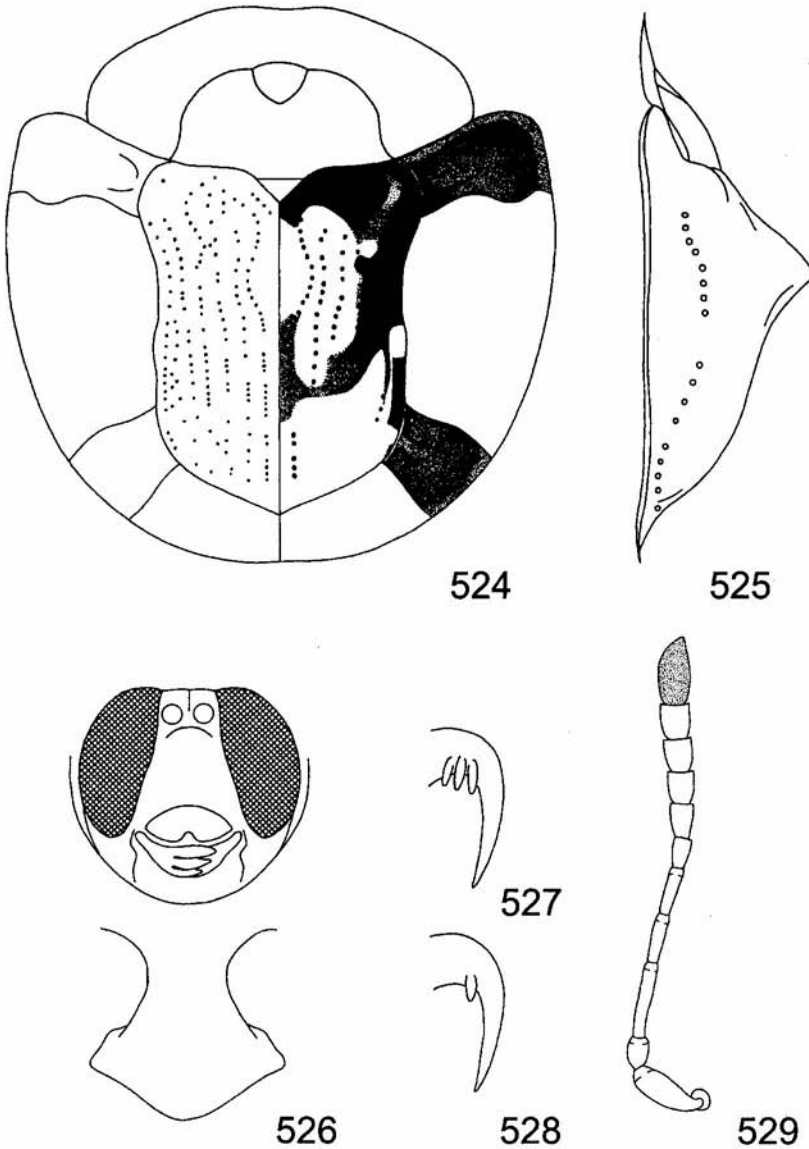
DESCRIPTION

L = 9.0-10.0; W = 8.9-9.5; Lp = 2.6-3.2; Wp = 6.0-6.2; L/W = 0.98-1.06; Wp/Lp = 1.93-2.30. Body circular (fig. 524). Sexual dimorphism indistinct, male slightly smaller and stouter than female.

Pronotum and scutellum yellow. Elytral disc yellow with dark brown spot at basal margin of elytra, between humeral callus and scutellum, and a dark brown elongate spot extending from humeral callus to base of posterolateral spots on each side of disc. Darke forms have the spot in anterior part of disc connected with an elongate side spot, which is also connected with an irregular transverse band in 2/3 length of disc. Sometimes the band connects with an elongate spot, extending from 1/3 to 2/3 length of disc on first interval. Explanate margin of elytra with complete, dark-brown

humeral and posterolateral spots (fig. 524), humeral spots are slightly hammer-shaped. Ventrites and legs yellow. Antennae yellow, last segment infusate, but never black.

Pronotum elliptical, 1.93-2.30 times wider than long, with maximum width in $2/5$ basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.



524-529. *Aspidimorpha suavis*: 524 - body in dorsal view, 525 - body in lateral view, 526 - head and prothorax, 527 - inner side of claw, 528 - outer side of claw, 529 - antenna

Elytral base distinctly wider than base of pronotum. Humeral angles rounded, slightly protruding anterad. Disc convex, with large, conical postscutellar tubercle (fig. 525), and barely marked principal impressions, and without postscutellar and lateral impressions. Puncturation moderately coarse, regular, distinct along the whole length of disc. Intervals equal in width, approximately five times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with sparse hairs.

Clypeus 1.3 times wider than long, with small impression in apical part. Labrum broad, emarginate to 1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 526).

Length ratio of antennal segments: 100: 38: 100: 65: 65: 38: 44: 44: 50: 91, segment 3 approximately 2.6 times longer than segment 2 and approximately 1.5 times longer than segment 4 (fig. 484).

Claws with short pecten on both sides. Inner pecten with three equal teeth extending to 1/4 length of claw (fig. 527), outer pecten with only one teeth extending to 1/5 length of claw (fig. 528).

Aedeagus spoon-shaped, apex broadly rounded with distinct angulate apical process. Apical part strongly curved ventrad. Ventral side with distinct longitudinally striated membrane (figs 462-464).

TYPE MATERIAL

Syntype: "Brunei N. Borneo" "Waterstradt" "Type" (MM); syntype: "Borneo" "Doesonalandem (Wahnes)" "ex coll. V. d. Poll" "Aspidomorpha suavis m. typ SPAETH det." (MM).

DISTRIBUTION

Indonesia: Borneo (both Indonesian and Malaysian; Brunei (fig. 319).

Aspidomorpha (s. str.) *subcruciata* BOHEMAN, 1854

(figs 465, 466, 530-536, tab. 8: 9)

Aspidomorpha subcruciata BOHEMAN, 1854: 293, 1856: 112, 1862: 270; GEMMINGER and HAROLD, 1876: 3651; SPAETH, 1914 e: 70.

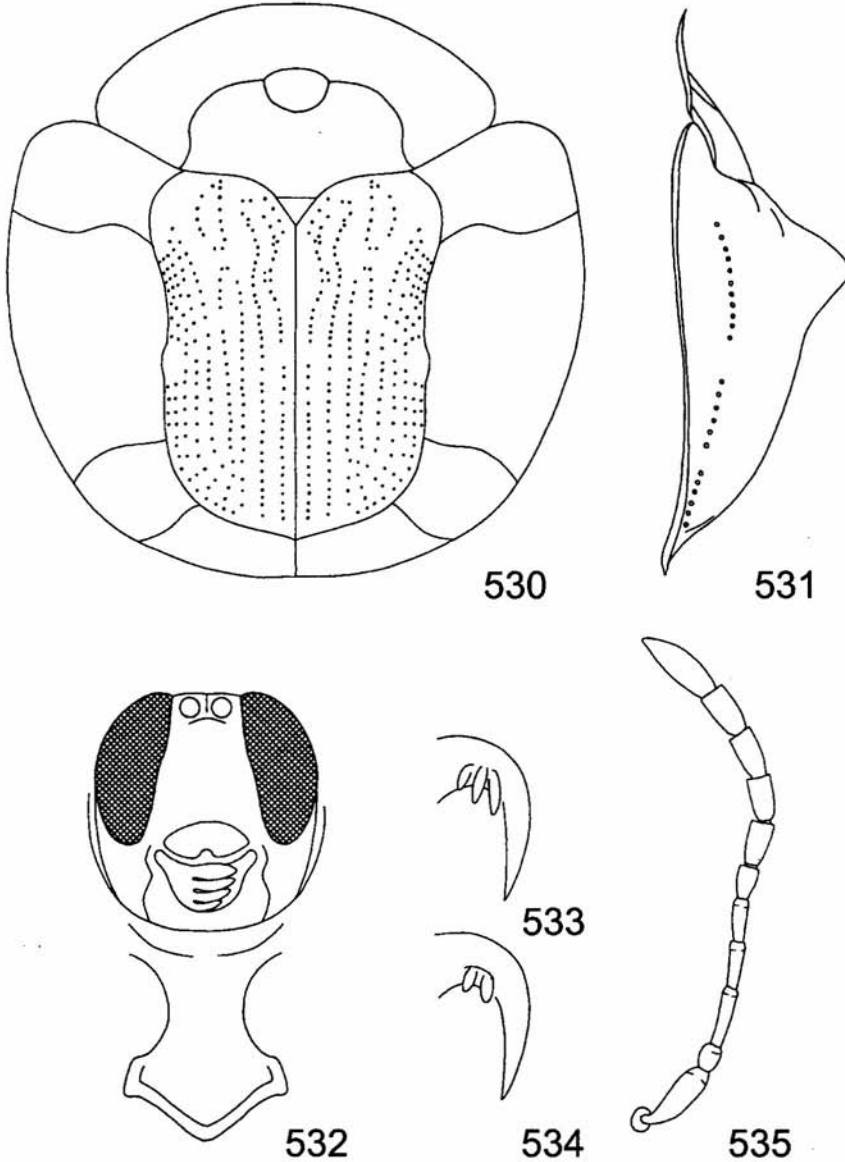
Aspidomorpha subcruciata: BOROWIEC, 1996: 13.

Aspidomorpha (*Aspidomorpha*) *subcruciata*: BOROWIEC, 1999: 200.

DIAGNOSIS

A member of *A. dorsata* group. Broad body and complete spots on explanate margin of elytra similar as in *A. subcruciata* and *A. intermedia* from the Philippines, *A. suavis* from Borneo, and *A. pacalis* from Tenimber. *A. suavis* differs in distinct brownish pattern on elytral disc (in *A. subcruciata* elytral disc is uniformly yellow or with barely marked yellowish-red pattern). *A. pacalis* differs in slimmer elytra abruptly converging posterad, and more pronounced humeral angles. The most similar is *A. intermedia*, which differs, however, in larger body, which is above 10.5 mm long (below 10.0 mm in *A. subcruciata*) and infusate one or two last antennal segments (in

A. subcruciata antennae are uniformly yellow). *A. intermedia* has spots of explanate margin of elytra usually darker than elytral disc, while in *A. subcruciata* these spots are of the same colour as elytral disc.



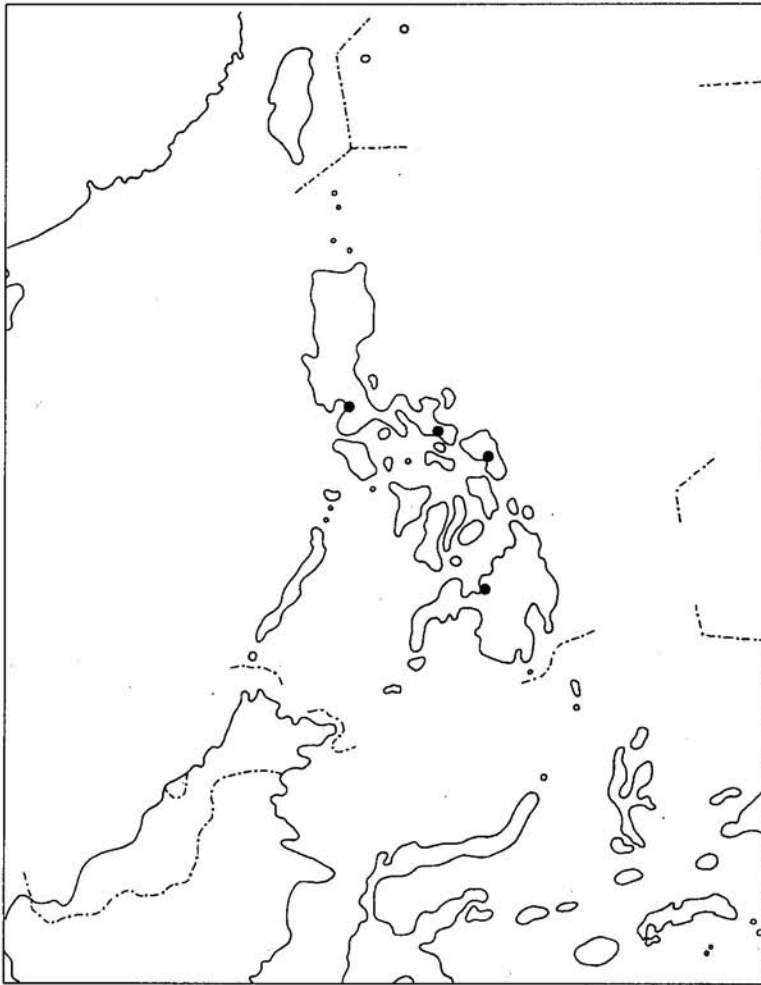
530-535. *Aspidimorpha subcruciata*: 530 - body in dorsal view, 531 - body in lateral view, 532 - head and prothorax, 533 - inner side of claw, 534 - outer side of claw, 535 - antenna

DESCRIPTION

Male: L = 8.5-10.0; W = 8.3-9.9; Lp = 2.8-3.1; Wp = 5.8-6.8; L/W = 1.01-1.04; Wp/Lp = 2.07-2.19. Female: L = 8.6-9.4; W = 8.2-8.3; Lp = 2.8; Wp = 5.7-5.9; L/W = 1.05-1.13; Wp/Lp = 2.03-2.11. Body circular (fig. 530). Sexual dimorphism barely marked, male slightly smaller and stouter than female.

Pronotum and scutellum yellow. Elytral disc uniformly yellow. Explanate margin of elytra with pale yellow humeral and posterolateral spots of indistinct borders. Ventrites, legs, and antennae uniformly yellow.

Pronotum elliptical, 2.03-2.07 times wider than long, with maximum width in 2/5 basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.



536. Distribution of *Aspidimorpha subcruciata*

Elytral base distinctly wider than base of pronotum. Humeral angles rounded, slightly protruding anterad. Disc convex, with large, conical postscutellar tubercle (fig. 531), very shallow principal impressions, and without postscutellar and lateral impressions. Puncturation moderately coarse, regular, distinct along the whole length of disc. Intervals equal in width, approximately five times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with long, sparse hairs.

Clypeus almost as wide as long, slightly convex. Labrum broad, emarginate to 1/5 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 530).

Length ratio of antennal segments: 100: 35: 76: 65: 59: 41: 56: 56: 62: 65: 112, segment 3 approximately 2.2 times longer than segment 2 and approximately 1.2 times longer than segment 4 (fig. 535).

Claws with short pecten on both sides. Inner pecten with three teeth extending to 1/3 length of claw (fig. 533), outer pecten with two teeth approximately twice shorter than first tooth of inner pecten (fig. 534).

Aedeagus slim, slightly widened apically, apex broadly rounded with broad and obtuse apical process. Apical part moderately curved ventrad. Ventral side without membrane (figs 465, 466).

TYPE MATERIAL

Lectotype: "Manilla" "Mhn" "Type" (NRS) – designated by BOROWIEC (1999); paralectotype: "Ins. Philipp (Cuming)" "subcruciata BHM." (ZMHU).

DISTRIBUTION

Philippines: Luzon, Samar (fig. 536).

Aspidimorpha (s. str.) *sulawesica* n. sp.

(figs 537-542, tab. 9: 9)

ETYMOLOGY

Named after its terra typica, Sulawesi of the Sunda Archipelago.

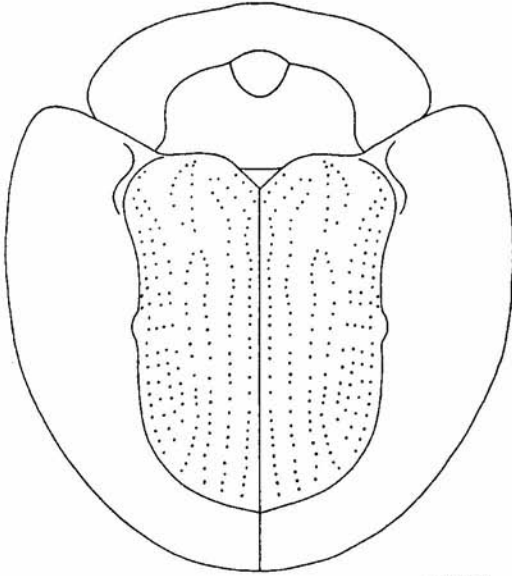
DIAGNOSIS

A member of *A. dorsata* group. *A. sulawesica* is distinguishable by its extremely short inner pecten of claws extending at most to 1/5 length of claw. The most similar are *A. inquinata* and *A. musta*, especially in body shape, but both differ in a distinct pattern on elytral disc, while elytra of *A. sulawesica* are almost completely yellow, only with a very small spot on the top of postscutellar tubercle.

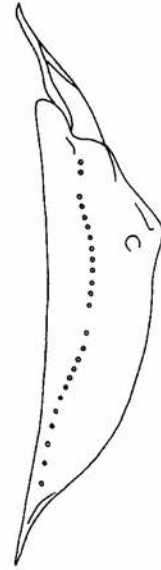
DESCRIPTION

L = 10.4; W = 9.4; Lp = 3.0; Wp = 6.4; L/W = 1.10; Wp/Lp = 2.13. Body almost circular (fig. 537). Sexual dimorphism unknown, the only examined specimen was a female.

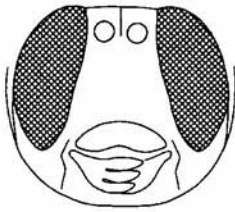
Pronotum and scutellum yellow. Elytral disc yellow, with small brownish spot on the top of postscutellar tubercle, punctures behind humeral callus with brownish areola. Explanate margin of elytra yellow, without spots. Ventrites and legs yellow. Antennae yellow, two last segment black, only base of penultimate segment yellow.



537



538



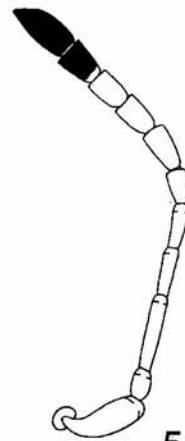
539



540



541



542

537-542. *Aspidimorpha sulawesica*: 537 - body in dorsal view, 538 - body in lateral view, 539 - head and prosternum, 540 - inner side of claw, 541 - outer side of claw, 542 - antenna

Pronotum elliptical, 2.13 times wider than long, with rounded sides. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Elytral base distinctly wider than base of pronotum. Humeral angles rounded, slightly protruding anterad. Disc convex, with small, conical postscutellar tubercle (fig. 538), distinct principal impressions, and without both postscutellar and lateral impressions. Puncturation moderately coarse and fine, regular, distinct along the whole length of disc. Punctures on sides of disc and behind postscutellar tubercle distinctly coarser than punctures in the middle of disc. Intervals equal in width, approximately five times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with short, erect hairs.

Clypeus 1.5 times wider than long, slightly convex, without impressions. Labrum broad, shallowly emarginate to 1/6 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impressions (fig. 539).

Length ratio of antennal segments: 100: 36: 94: 61: 55: 41: 55: 47: 47: 47: 83, segment 3 approximately 2.6 times longer than segment 2 and approximately 1.5 times longer than segment 4 (fig. 542).

Claws with short pecten on both sides. Inner pecten with four equal teeth extending to 1/5 length of claw (fig. 540), outer pecten with two teeth extending to 1/6 length of claw (fig. 541).

Aedeagus has not been examined, the only available specimen being a female.

TYPE MATERIAL

Holotype: "Indonesia, Sulawesi, Bonthain, 1883" (LB).

DISTRIBUTION

Indonesia: Sulawesi.

Aspidimorpha (s. str.) *tamdaoensis* n. sp.

(figs 543-548, tab. 5: 9)

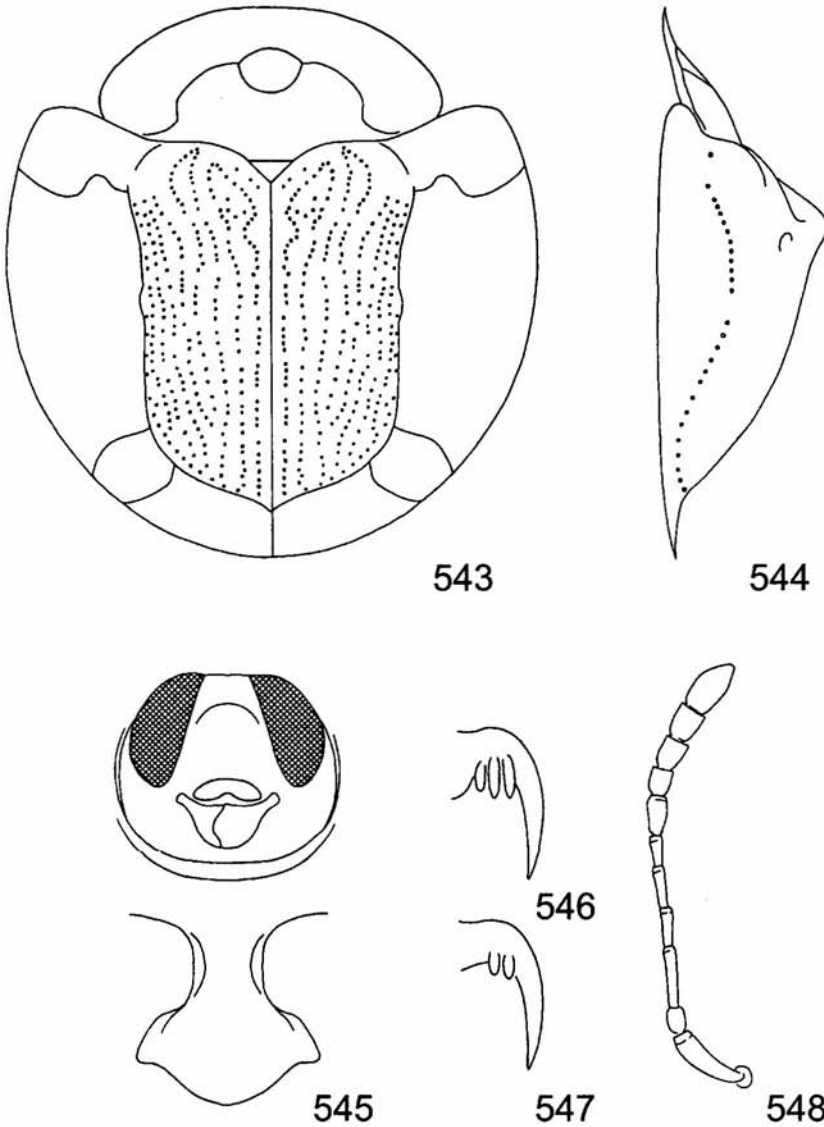
ETYMOLOGY

Named after its locus typicus, Tam Dao plateau in northern Vietnam.

DIAGNOSIS

A member of *A. sanctaegrucis* group. Large, stout body, irregular surface of elytra, and large postscutellar tubercle similar as in *A. sanctaegrucis*. *A. tamdaoensis* differs distinctly from all species of the *A. sanctaegrucis* group in prosternal collar and anterior part of prosternal process with long and dense pubescence (in other species prosternal collar and prosternal process have at most very sparse hairs and often appear to be bare). *A. tamdaoensis* also has pecten of tarsal claws shorter than in *A. sanctaegrucis* and with inner teeth extending at most to 1/3 length of claw. Such short pecten has *A. lobata* but differs in more regular elytral surface and less explanate body. *A. tamdaoensis* has elytral surface very irregular,

only populations of *A. sanctaegrucis* from E Himalayas and *A. birmanica* have similar sculptured elytra but they never have punctures in row as dense as in *A. tamdaoensis*.



543-548. *Aspidimorpha tamdaoensis*: 543 - body in dorsal view, 544 - body in lateral view, 545 - head and prosternum, 546 - inner side of claw, 547 - outer side of claw, 548 - antenna

DESCRIPTION

Female: $L = 14.3-14.6$, $W = 13.9$, $L_p = 4.4-4.5$, $W_p = 8.8-8.9$, $L/W = 1.03-1.05$, $W_p/L_p = 1.96-2.02$; Body circular (fig. 543), sexual dimorphism unknown, two examined specimens were females.

Pronotum, scutellum and elytral disc uniformly yellowish-brown to reddish-brown or pronotum yellowish-brown but scutellum and elytral disc reddish-brown. Explanate margin of elytra with humeral and posterolateral spots, of the same colour as elytral disc, humeral spots hammer-shaped. Ventrites yellow. Legs yellow. Antennae yellow, two last segments black.

Pronotum elliptical, approximately twice wider than long, with maximum width in $2/5$ basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Elytral base distinctly wider than base of pronotum. Humeral angles broadly rounded, slightly protruding anterad. Elytral disc strongly convex, with large, conical postscutellar tubercle (fig. 544), with postscutellar impressions bordered by low fold, principal and lateral impressions, and two small additional impressions. Puncturation moderately coarse, distinct along the whole length of disc, regular, punctures in rows distinctly denser than in most relative species. Intervals mostly equal in width, approximately two to three times wider than punctures. Surface of intervals glabrous and shiny. Surface of whole elytra ver irregular, spaces between punctures slightly elevated. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with long, dense erect hairs.

Clypeus approximately 1.4 times wider than long, shallowly impressed in the middle. Labrum moderately broad, shallowly emarginate to $1/3$ length. Mandibles toothless, with cutting edge only. Prosternal process rhomboidal, moderately wide, slightly depressed in the middle. Prosternal collar and anterior half of prosternal process with long, dense hair (fig. 545).

Length ratio of antennal segments: 100: 37: 86: 51: 54: 40: 54: 37: 40: 40: 74, segment 3 approximately 2.3 times longer than segment 2 and approximately 1.6 times than segment 4 (fig. 548).

Claws with distinct pecten on both sides. Inner pecten with three teeth extending to $1/3$ length of claw (fig. 546), outer pecten with two teeth extending only slightly beyond margin of claw (fig. 547)

Aedeagus not examined, both available specimens were females.

TYPE MATERIAL

Holotype: "Vietnam North, Vinh phu, Tam Dao, 3 IV 1998" (LB); paratype: the same data (LB).

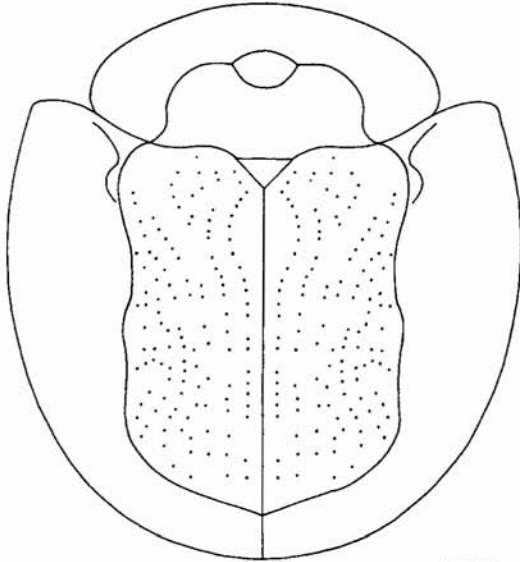
DISTRIBUTION

N Vietnam.

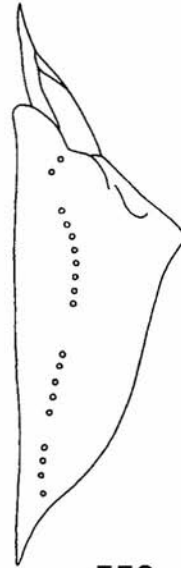
Aspidimorpha (s. str.) *timorensis* n. sp.
(figs 401, 549-554, 561, 562, tab. 11: 9)

ETYMOLOGY

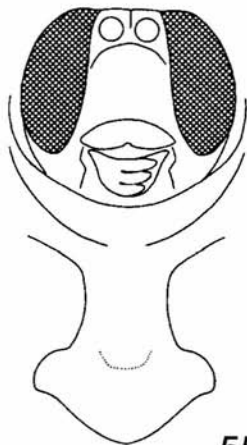
Named after its terra typica, Timor.



549



550



551



552



553



554

549-554. *Aspidimorpha timorensis*: 537 - body in dorsal view, 538 - body in lateral view, 539 - head and prosternum, 540 - inner side of claw, 541 - outer side of claw, 542 - antenna

DIAGNOSIS

A member of *A. indica* group, usually larger than remaining species of the group, size wise comparable to *A. dorsata* group. Diagnosed by short inner pectens of claws, extending at most to 1/3 length of claw, and acute humeral angles. From *A. pacalis*, *A. intermedia* and *A. subcruciata*, which also have short inner pecten of claws, *A. timorensis* differs in slimmer body with sides distinctly narrowed posterad and barely visible spots on explanate margin of elytra, while these spots are distinctly marked in the relatives.

DESCRIPTION

Male: L = 8.2; W = 7.3; Lp = 2.6; Wp = 5.1; L/W = 1.12; Wp/Lp = 1.96. Female: L = 8.6; W = 7.7; Lp = 2.7; Wp = 5.2; L/W = 1.11; Wp/Lp = 1.92. Body slightly triangular (fig. 549). Sexual dimorphism barely marked, male slightly smaller than female.

Pronotum and scutellum yellow. Elytral disc yellow, without spots. Explanate margin of elytra with yellow humeral spots extending to 1/4 width of explanate margin and with yellow, more or less distinct posterolateral spots of indistinct borders, extending to half width of marginalia or to extreme margin. Spots are well visible only on underside of marginalia, explanate margin appears immaculate from above. Ventrites and legs yellow. Antennae yellow, two last segments black.

Pronotum elliptical, 1.92-1.96 times wider than long, with maximum width in half length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Elytral base distinctly wider than base of pronotum. Humeral angles sharp, slightly protrude anterad. Extreme margin behind humeral angles shallowly emarginate. Disc convex, with distinct, conical postscutellar tubercle (fig. 550), distinct principal impressions, and without postscutellar and lateral impressions. Puncturation fine to moderately coarse, regular, distinct in anterior half of disc, barely marked on slope. Intervals equal in width, approximately four to six times wider than punctures. Surface of intervals extremely glabrous and lustrous. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with sparse hairs.

Clypeus 1.3 times wider than long, slightly convex, without impressions. Labrum broad, emarginate to 1/6 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impressions (fig. 551).

Length ratio of antennal segments: 100: 32: 87: 61: 61: 39: 55: 55: 51: 55: 97, segment 3 approximately 2.7 times longer than segment 2 and approximately 1.4 times longer than segment 4 (fig. 554).

Claws with pecten on both sides. Inner pecten with three teeth extending to 1/3 length of claw (fig. 552), outer pecten with two teeth extending to 1/5 length of claw (fig. 553).

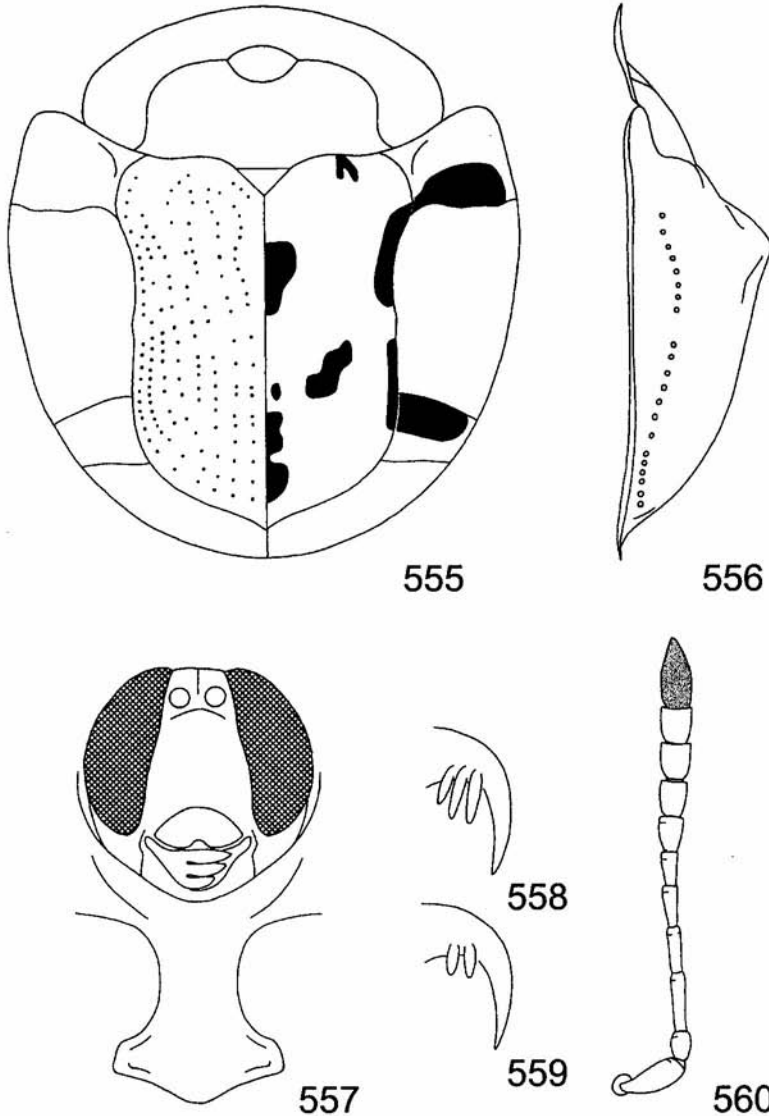
Aedeagus slim, slightly widened apically, apex broadly rounded with broad and obtuse apical process. Apical part moderately curved ventrad. Ventral side without membrane (figs 561, 562).

TYPE MATERIAL

Holotype: "INDONESIA, Timor" (LB); paratype: "INDONESIA Timor" (LB).
Paratype has left elytron missing.

DISTRIBUTION

Indonesia: Timor (fig. 401).



555-560. *Aspidimorpha toxopei*: 555 - body in dorsal view, 556 - body in lateral view, 557 - head and prosternum, 558 - inner side of claw, 559 - outer side of claw, 560 - antenna

***Aspidimorpha* (s. str.) *toxopei* SPAETH, 1926**

(figs 114, 555-560, 571, 572, tab. 13: 9)

Aspidimorpha toxopei SPAETH, 1926 a: 308.*Aspidimorpha* (*Aspidimorpha*) *toxopei*: BOROWIEC, 1999: 203.

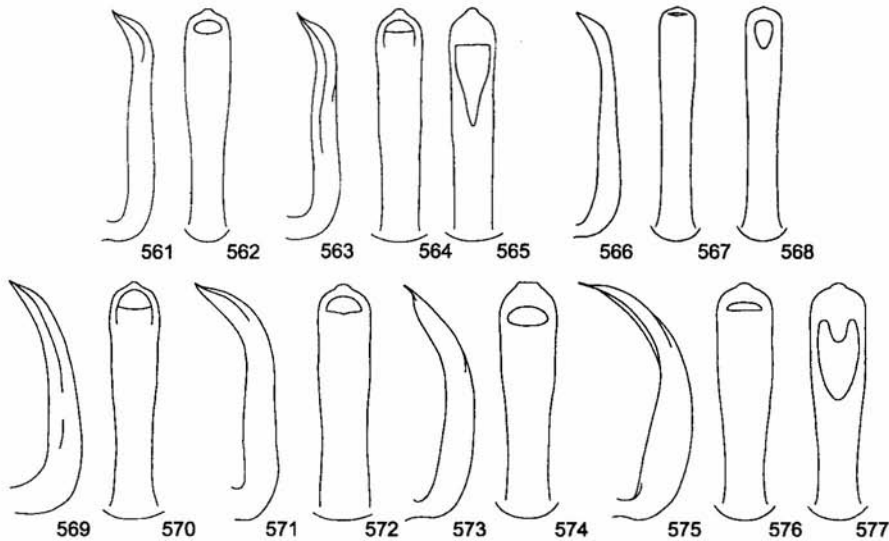
DIAGNOSIS

A member of *A. indica* group. Distinguished by constant dark pattern of elytral disc, especially by dark spot on posterior part of postscutellar tubercle, spot on humeral calli, and spots on suture in posterior half of disc. Known only from Buru Island (Moluccas) and Timor.

DESCRIPTION

Male: L = 6.7-7.1; W = 6.0-6.3; Lp = 2.0-2.3; Wp = 4.1-4.6; L/W = 1.09-1.16; Wp/Lp = 1.91-2.19. Female: L = 6.8; W = 5.7; Lp = 2.2; Wp = 4.4; L/W = 1.19; Wp/Lp = 2.00. Body almost circular (fig.555), sexual dimorphism barely marked, male slightly stouter than female.

Pronotum yellow. Scutellum yellow or yellowish-brown. Elytral disc yellow, with distinct black constant pattern of three spots on intervals 1-2, in 1/4, 3/4 and 4/5 length of disc, two spots on fifth interval at basal margin of elytra and in half length of disc, and elongate spot on each side, extending from base of humeral callus to base of posterolateral spots on explanate margin of elytra, but often interrupted at its half length by fold of marginal interval. Explanate margin with brownish-yellow humeral and posterolateral spots. Usually posterior half of hu-



561-577. Aedeagi: 561, 562 - *Aspidimorpha timorensis*; 563-565 - *A. transparipennis*; 566-568 - *A. hexaspilota*; 569, 570 - *A. denticollis*; 571, 572 - *A. toxopei*; 573, 574 - *Nilgiraspis andrewesi*; 575-577 - *Conchyloctenia nigrovittata*; 561, 563, 566, 569, 571, 573, 575 - lateral; 562, 564, 567, 570, 572, 574, 576 - dorsal; 565, 568, 577 - ventral

meral spots and anterior half of posterolateral spots of same colour as elongate spot on side of disc (fig. 555). Ventrites yellow with dark brown lateral plates of metathorax in nominotypical form from Buru Is., and partly black in the population from Timor Is. Legs yellow. Antennae yellow, last segment infusate to black. Penultimate segment slightly infusate, when last segment black.

Pronotum elliptical, 1.91-2.00 times wider than long, with maximum width in 1/3 basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Elytral base wider than base of pronotum. Humeral angles rounded, slightly protruding anterad. Elytral disc convex with low, conical postscutellar tubercle (fig. 556), very shallow postscutellar impressions, and shallow principal and lateral impressions. Puncturation moderately coarse, distinct along the whole length of disc. Intervals mostly equal in width, approximately three times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with very sparse hairs.

Clypeus almost as wide as long, slightly convex, in apical part with fine impression. Labrum broad, emarginate to 1/4 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 557).

Length ratio of antennal segments: 100: 37: 81: 65: 62: 50: 50: 50: 50: 50: 100, segment 3 approximately 2.2 times longer than segment 2 and approximately 1.2 times than segment 4 (fig. 560).

Claws with distinct pecten on both sides. Inner pecten with three teeth extending to half length of claw (fig. 558), outer pecten with two teeth extending to 1/3 length of claw (fig. 559).

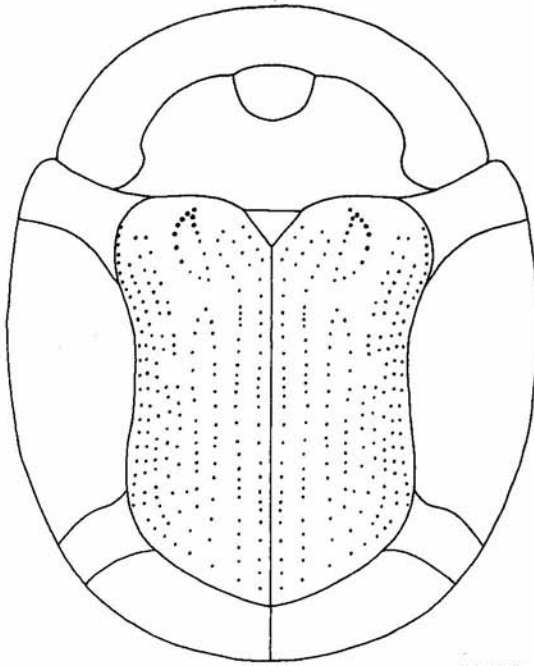
Aedeagus moderately slim, almost parallel-sided, slightly narrowed at 1/3 basal length, apex broadly rounded, with broad and obtuse apical process. Apical part distinctly curved ventrad. Ventral side without membrane (figs 571, 572).

TYPE MATERIAL

Lectotype: "L.J. Toxopeus, Buru, Station 4, 29-31 Jan '22" "Lectotype" (ITZ) – present designation; paralectotype: "L.J. Toxopeus, Buru, Station 9, 20-VI-VII '21" "paralectotype" (ITZ); paralectotype: "L.J. Toxopeus, Buru, Station 9, 20-VI-10-VII '21" "paralectotype" (ITZ); 2 paralectotypes: "L.J. Toxopeus, Buru, Station 9, May 1921" "paralectotype" (ITZ); paralectotype: "L.J. Toxopeus, Buru, Station 13, ult. Aug. 1921" "paralectotype" (ITZ); paralectotype: "L.J. Toxopeus, Buru, Station 13, 28-II-3-III '22" "paralectotype" (IITZ); 3 paralectotypes: "Buru, station 9, 1-19 VIII 1921, L.J. Toxopeus, cotypus" (MM); 2 paralectotypes: "Buru, station 13, 28 II-3 III 22, cotyp" (MM).

DISTRIBUTION

Indonesia: Buru (fig. 114).



578



579



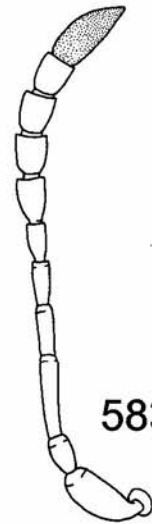
580



581



582



583

578-583. *Aspidimorpha transparipennis*: 578 - body in dorsal view, 579 - body in lateral view, 580 - head and prosternum, 581 - inner side of claw, 582 - outer side of claw, 583 - antenna

***Aspidimorpha* (s. str.) *transparipennis* (MOTSCHULSKY, 1860)**

(figs 47, 578-587, 563-565, tab. 13: 7, 8)

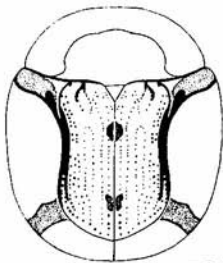
Coptocycla transparipennis MOTSCHULSKY, 1860: 41; GEMMINGER and HAROLD, 1876: 3675; KRAATZ, 1879: 270.*Aspidimorpha transparipennis*: KRAATZ, 1879: 26; WEISE, 1900: 295; SPAETH, 1914 d: 129; 1914 e: 67, 1921 b: 84, 1942 a: 12; SPAETH and REITTER, 1926: 10; CHÜJÖ, 1934: 151; GRESSITT, 1952: 468; GRESSITT and KIMOTO, 1963: 954; KIMOTO, 1966: 644; 1976: 173; MEDVEDEV and ZAITSEV, 1978: 171 (larva); BALSBAUGH and RILEY, 1980: 175; TAKIZAWA, 1980 b: 12; BOROWIEC, 1985 a: 26; AN et al., 1985: 13; CHEN et al., 1986: 587, 636; YU, 1986: 683; MEDVEDEV, 1992: 598.*Aspidimorpha* (*Aspidimorpha*) *transparipennis*: BOROWIEC, 1999: 203.*Aspidimorpha transparipennis* var. *vetula* WEISE, 1900: 295; SPAETH, 1914 d: 129 (as syn. of *transparipennis*).*Aspidimorpha elliptica* GORHAM, 1885: 280.*Aspidimorpha transparipennis* ab. *elliptica*: SPAETH, 1914 d: 129, 1914 e: 67; CHÜJÖ, 1934: 151.

DIAGNOSIS

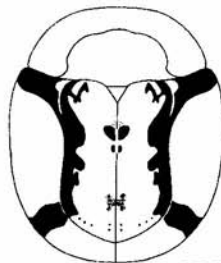
A member of *A. indica* group, but comparable also to *A. furcata* group in its small size. It differs from all species of both groups in depressed elytra without postscutellar tubercle or elevation. Beside *A. difformis*, *A. transparipennis* is the only species of the genus in eastern Palaearctic Region.

DESCRIPTION

L = 5.6-7.1; W = 4.4-5.4; Lp = 1.9-2.4; Wp = 3.7-4.4; L/W = 1.23-1.42; Wp/Lp = 1.77-2.05. Body broadly-oval (fig. 578), sexual dimorphism barely marked, male slightly stouter than female.



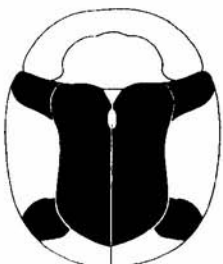
584



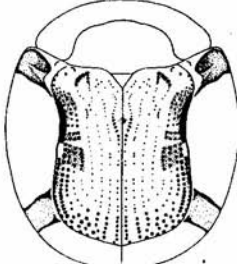
585



586



587



588



589

584-589. Variation of dorsal pattern: 584-587 - *Aspidimorpha transparipennis*; 588, 589 - *A. difformis*

Pronotum and scutellum yellow. Colouration of elytra variable. Disc yellow, on each side with elongate spot, extending from base of humeral callus to base of posterolateral spots on explanate margin (fig. 584). Stronger and darker coloured forms have disc with two spots on first interval at 1/3 and 2/3 length of disc, darker spot at basal margin of elytra on fourth interval, and elongate, yellowish-brown, sometimes dark brown or black band along side of disc, extending from basal margin of elytra to base of posterolateral spots on explanate margin (fig. 585). Punctures more or less distinctly marked with areola. Sometimes areolae between a spot on first interval, at 2/3 length of disc, and on elongate spot on side of disc expand to form more or less distinct, V-shaped band across disc (fig. 586). Darkest forms have disc dark brown except small, yellow spot behind scutellum (fig. 587). Explanate margin with yellowish-brown, dark brown or black humeral and posterolateral spots (figs 584-587). Ventrites and legs yellow. Antennae yellow, last segment black, sometimes penultimate segment infuscate.

Pronotum elliptical, 1.77-2.05 times wider than long, with maximum width at 1/3 basal length, sides rounded. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.

Elytral base only slightly wider than base of pronotum. Humeral angles almost rightangled, only slightly protrude anterad. Elytral disc regularly convex, without postscutellar tubercle or gibbosity, with top of convexity in postscutellar point (fig. 579), in posterior part depressed, and barely marked principal impressions. Punctuation regular, moderately coarse, distinct along the whole length of disc. Intervals mostly equal in width, approximately three times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra glabrous and shiny. Apex of elytral epipleura with sparse hairs.

Clypeus 1.6 times wider than long, in apical part usually with elongate impression. Labrum broad, emarginate to 1/5-1/4 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impression (fig. 580).

Length ratio of antennal segments: 100: 47: 100: 65: 50: 44: 50: 44: 44: 100, segment 3 approximately 2.1 times longer than segment 2 and approximately 1.5 times than segment 4 (fig. 583).

Claws with pecten on both sides. Inner pecten with four teeth extending to 2/5 length of claw (fig. 581), outer pecten with two teeth extending to 1/4 length of claw (fig. 582)

Aedeagus slim, almost parallel-sided, only slightly narrowed basally, apex broadly rounded, with broad and obtuse apical process. Apical part moderately curved ventrad. Ventral side with distinct, longitudinally striated membrane (figs 563-565).

HOST PLANT

Convolvulaceae: Calystegia japonica (CHŪJŌ et KIMOTO 1961).

TYPE MATERIAL

Coptocyclus transparipennis: type not found.

Aspidomorpha transparipennis var. *vetula*: lectotype: "Japon Staud." "var.

vetula m." (ZMHU) – designated by BOROWIEC (1999); 2 paralectotypes: "Japon Staud." (ZMHU); 2 paralectotypes "Japon" (ZMHU).

Aspidomorpha transparipennis ab. *elliptica*: type not found.

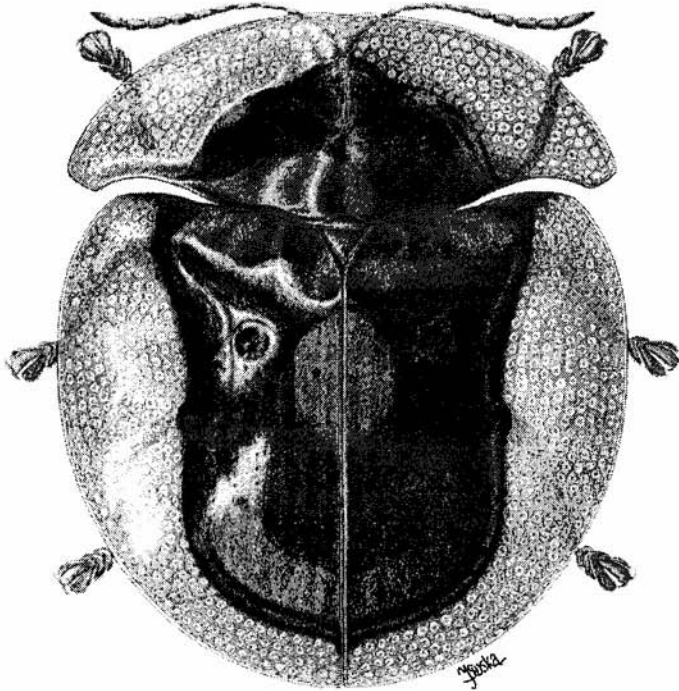
DISTRIBUTION

China: Hebei, Heilongjiang, Jilin, Shandong; Japon: Hokkaido, Honshu, Kyushu; Korea; Russia: the Far East (fig. 47).

Subgenus: *Dianaspis* CHEN et ZIA, 1984

Sexual dimorphism distinct. Base of pronotum in male deeply bisinuate. Elytral base in male slightly narrower, in female slightly wider than base of pronotum. Elytral disc regularly convex with deep principal impressions. Surface of elytra extremely glabrous and lustrous. Inner pecten of tarsal claws very short, only slightly extending beyond margin of claw, outer pecten almost obsolete.

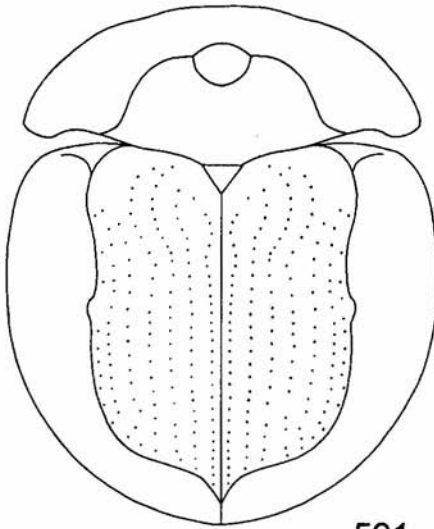
Only one hitherto known species from Indochina.



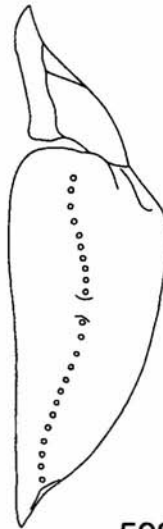
590. *Aspidomorpha denticollis*, habitus

***Aspidimorpha (Dianaspis) denticollis* SPAETH, 1932**

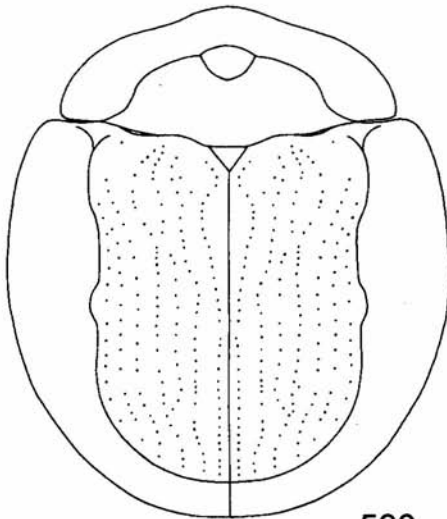
(figs 569, 570, 590-598, 606, tab. 14: 1, 2)

Aspidomorpha denticollis SPAETH, 1932 a: 200; MEDVEDEV and EROSHKINA, 1988: 123 (as syn. of *A. miliaris* F.).*Aspidimorpha (Dianaspis) denticollis*: BOROWIEC, 1999: 207.*Dianaspis bifoveolata*: YU, 1983: 795 (nomen nudum).

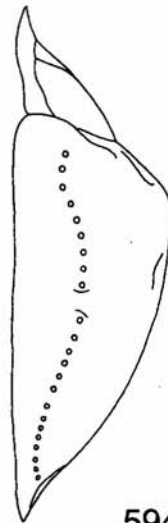
591



592



593



594

591-594. *Aspidimorpha denticollis*: 591, 592 - male, 593, 594 - female; 591, 593 - body in dorsal view, 592, 594 - body in lateral view

Dianaspis bifoveolata CHEN et ZIA, 1984: 80, 82; CHEN et al., 1986: 589, 636, pl. XIV (incl. colour fig.); BOROWIEC, 1992: 124 (as syn.).

DIAGNOSIS

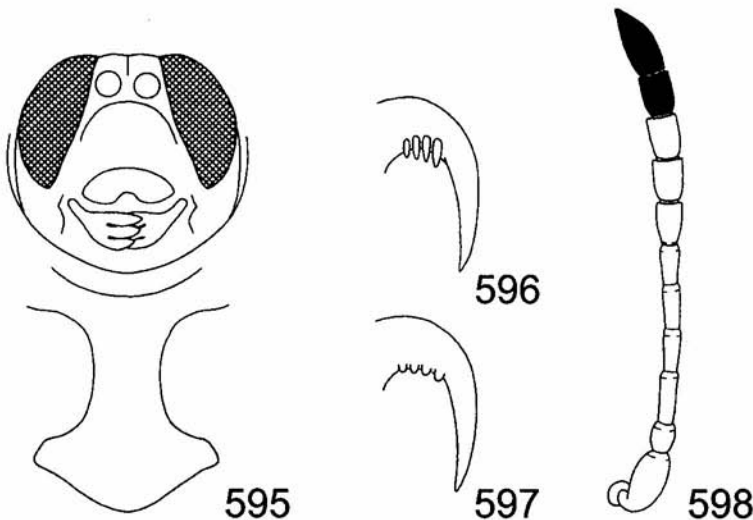
Very distinct species with strong sexual dimorphism. Males distinguished by deep, double emargination of pronotal base and posterior angles of pronotum strongly protruding posterad. Females, whose appearance is typical for the genus, are somewhat similar to immaculate members of *A. miliaris* group, but differ in elytral disc with deep principal impressions, very smooth, lustrous surface of elytra, and obsolete outer pecten of claws. Females of *A. sarawacensis* are also somewhat similar but differ in having toothless mandibles.

DESCRIPTION

Male: L = 11.6; W = 9.9; Lp = 3.8; Wp = 7.7; L/W = 1.17; Wp/Lp = 2.02; Female: L = 12.0; W = 10.1; Lp = 3.2; Wp = 7.8; L/W = 1.19; Wp/Lp = 2.44. Body broadly-oval (figs 590, 591, 593), sexual dimorphism extremely pronounced, in male base of pronotum wider than base of elytra, basal margin of pronotum distinctly emarginate on each side, and humeri broadly rounded; in female base of pronotum narrower than base of elytra, basal margin of pronotum not emarginate, and humeri less rounded.

Pronotum and scutellum yellow. Disc yellow, explanate margin of elytra yellow without spots. Ventrites and legs yellow. Antennae yellow, two last segments black.

Pronotum semicircular, 2.02-2.44 times wider than long, especially in female (fig. 593), with maximum width at basal margin. In male base of pronotum



595-598. *Aspidimorpha denticollis*: 595 - head and prosternum, 596 - inner side of claw, 597 - outer side of claw, 598 - antenna

bisinate and pronotal angles distinctly protrude posterad (fig. 591). Disc moderately convex, glabrous, lustrous. Explanate margin glabrous, lustrous.

Elytral base in male slightly narrower, in female slightly wider than base of pronotum. Humeral angles in male very broadly rounded and circular, in females broadly rounded, marked, do not protrude anterad. Elytral disc regularly convex, with top of convexity in postscutellar point, without postscutellar tubercle (figs 592, 594), with deep principal impressions, without postscutellar and lateral impressions. Punctuation mostly regular, very fine, barely visible. Intervals mostly equal in width, approximately six to seven times wider than punctures. Surface of intervals glabrous, lustrous. Explanate margin of elytra glabrous and lustrous. Apex of elytral epipleura pubescent.

Clypeus two times wider than long, slightly convex, without impressions. Labrum broad, emarginate to 1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, without impressions (fig. 595).

Length ratio of antennal segments: 100: 40: 73: 60: 63: 56: 53: 56: 60: 56: 106, segment 3 approximately 1.8 times longer than segment 2 and approximately 1.2 times than segment 4 (fig. 598).

Claws with short pecten on both sides. Inner pecten with four equal teeth, only slightly extending beyond margin of claw (fig. 596), outer pecten with fourth teeth half the length of first claw of inner pecten (fig. 597).

Aedeagus slim, slightly widened apically, apex broadly rounded, with broad and obtuse apical process. Apical part gently curved ventrad. Ventral side without membrane (figs 569, 570).

TYPE MATERIAL

Aspidomorpha denticollis: holotype: "Bao-Lac (Tonkin)" "type unic." (MM).

Dianaspis bifoveolata: holotype (male): "[Chinese words]" (ASB); paratype (female): "[Chinese words]" (ASB).

DISTRIBUTION

China: Yunnan; N Vietnam: Bao Lac (fig. 606).

REMARKS

MEDVEDEV and EROSHKINA (1988) synonymized *A. denticollis* with *A. miliaris*, but they never studied the type of this unique species and ignored important characters given in original description. Each species belongs to a different subgenus.

Genus: *Conchyloctenia* SPAETH, 1902

Aspidomorpha sgen. *Conchyloctenia* SPAETH, 1902b: 449 (type species: *Cassida hybrida* BOHEMAN, 1854, designated by MAULIK, 1919), 1914 e: 79 (as genus); 1924: 296; HINCKS, 1952: 337 (as subgenus of *Aspidomorpha*); SEENO et WILCOX, 1982: 175 (as subgenus of *Aspidomorpha*); BOROWIEC, 1994: 11, 42 (as genus).

Body elongate, parallel-sided (in some African species also short-oval to almost hemispherical). Pronotum always semicircular. Elytral base usually only slightly wider than pronotum. Elytral disc always without postscutellar tubercle, often depressed. Clypeus slightly convex with elevated margin before antennal insertions. Claws with pecten on both margins.

Mostly Afrotropical, with 15 species in Africa, and one in the Oriental Region.

***Conchylactenia nigrovittata* (BOHEMAN, 1854)**

(figs 575-577, 599-606, tab. 6: 9)

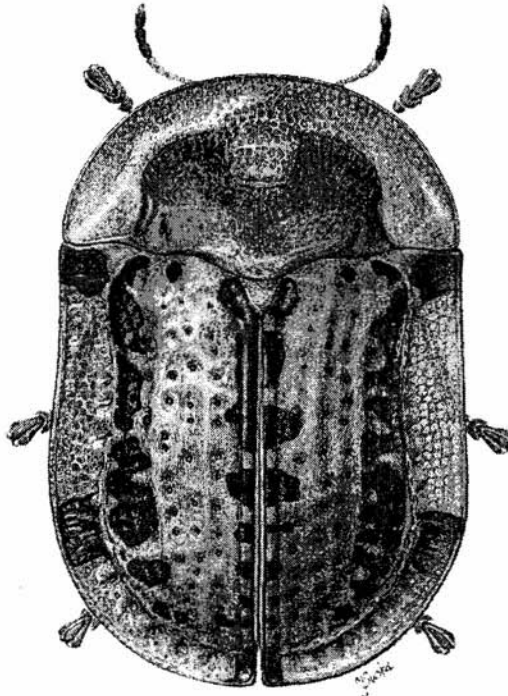
Cassida nigrovittata BOHEMAN, 1854: 341; 1856: 120, 1862: 294.

Aspidomorpha nigrovittata: GEMMINGER and HAROLD, 1876: 3650.

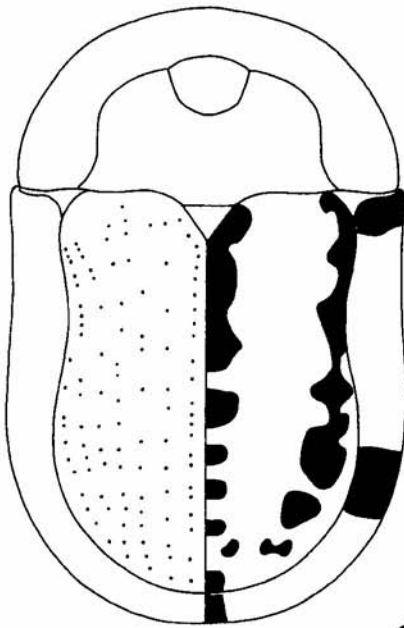
Conchylactenia nigrovittata: MAULIK, 1916: 586; 1919: 339 (incl. fig.); BOROWIEC, 1990 a: 701, 1999: 213.

DIAGNOSIS

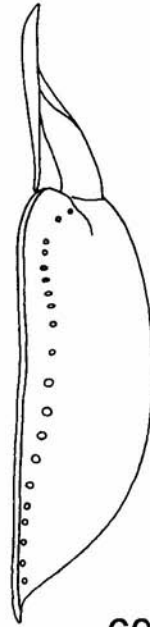
Elongate, almost parallel-sided body and regular coarse puncturation of elytral disc similar as in *Conchylactenia hybrida*-group from Africa, but *C. nigrovittata* distinctly differs from African congeners in pattern on elytral disc with black longitudinal bands on deep red background. Among Oriental members of the



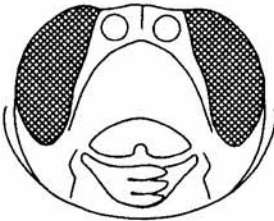
599. *Conchylactenia nigrovittata*, habitus



600



601



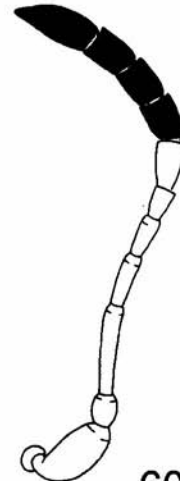
602



603



604



605

600-605. *Conchyloctenia nigrovittata*: 600 - body in dorsal view, 601 - body in lateral view, 602 - head and pronotum, 603 - inner side of claw, 604 - outer side of claw, 605 - antenna

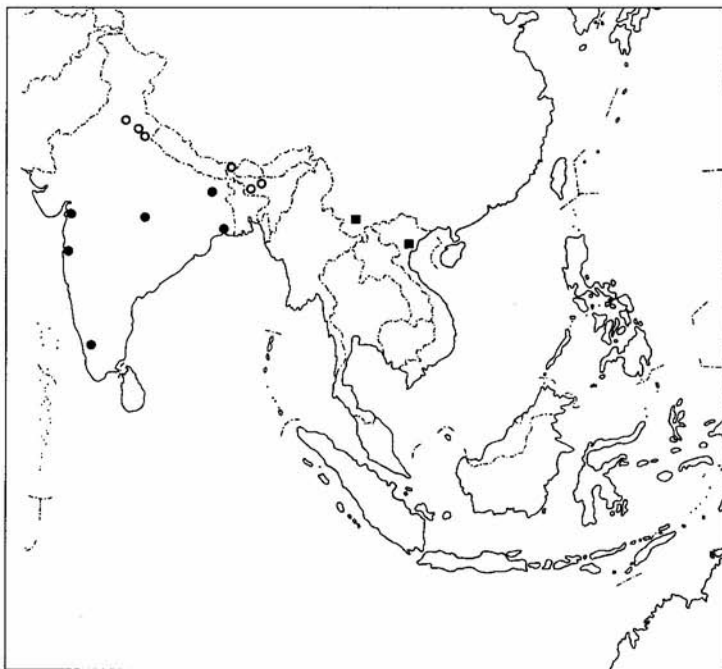
tribe, only *Aspidimorpha orientalis* is somewhat similar to *C. nigrovittata*, especially in its semicircular pronotum, elongate elytra, and elytral disc without postscutellar tubercle. *A. orientalis* differs in flat clypeus and finer puncturation of elytral disc without impressed rows.

DESCRIPTION

L = 8.0-9.8; W = 5.6-6.4; Lp = 2.5-3.2; Wp = 4.9-6.1; L/W = 1.43-1.53; Wp/Lp = 1.90-2.03. Body long-oval, almost parallel-sided (figs 599, 600), sexual dimorphism barely marked, male slightly stouter than female.

Pronotum and scutellum yellow, yellowish-red to yellowish-brown. Elytral disc yellow, yellowish-red, red to yellowish-brown (fresh, fully sclerotized specimens are deep red, but the colour faded in dried specimens) with constant black pattern which is composed of row of irregular spots along intervals 1 and an irregular band along intervals 6-7. Explanate margin of elytra with black humeral, posterolateral, and narrow sutural spots (figs 599, 600). Ventrites black except yellow lateral plates of thorax, yellow plates surrounding coxal cavities, and yellow sides and apical margin of abdomen. Legs yellow. Antennae yellow, four last segments black.

Pronotum semicircular, 1.90-2.03 times wider than long, with maximum width at basal margin. Disc moderately convex, glabrous and shiny. Explanate margin glabrous and shiny.



606. Distribution of *Conchyloctenia nigrovittata* (black circles), *Aspidimorpha denticollis* (black squares) and *Aspidimorpha orientalis* (white circles)

Elytral base almost as wide as base or slightly wider than pronotum. Humeral angles rightangled. Elytral disc regularly convex, depressed on the top, without tubercles or impressions (fig. 601). Puncturation regular, moderately coarse to coarse, distinct along the whole length of disc. Rows impressed, punctures in rows often form groups. Intervals mostly equal in width, 4-5 times wider than punctures. Surface of intervals glabrous and shiny. Explanate margin of elytra tend to form shallow gutter with more or less distinct transverse wrinkles. Apex of elytral epipleura bare.

Clypeus broad, 1.8 times wider than long, slightly convex, anterior border strongly elevated. Labrum broad, emarginate to 1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, narrow, with elongate impression (fig. 602).

Length ratio of antennal segments: 100: 38: 109: 65: 50: 38: 56: 50: 50: 50: 100, segment 3 approximately 2.9 times longer than segment 2 and approximately 1.7 times than segment 4 (fig. 605).

Claws short, broad, with distinct pecten on both sides. Inner pecten with four teeth extending to half length of claw (fig. 603), outer pecten with three teeth extending to 1/4-1/3 length of claw (fig. 604).

Aedeagus moderately broad, slightly widened apically, apex broadly rounded, with moderately large and obtuse apical process. Apical part strongly curved ventrad. Ventral side with distinct, longitudinally striated membrane (figs 575-577).

TYPE MATERIAL

Syntype: "Calcutta" "ex coll. Chevrolat" (BMNH).

DISTRIBUTION

India: Bengal, Mysore (fig. 606).

REMARKS

The genus *Conchyloctenia* SPAETH is very characteristics of the Afrotropical Region, where some species belong to the most common and widespread species of *Cassidinae*. Next to two species of the subgenus *Orphnodella*, which also is characteristic for Ethiopian Region, *Conchyloctenia nigrovittata* represents Afrotropical element in the fauna of the Oriental Region. Oriental members of the subgenus *Orphnodella* and *Conchyloctenia nigrovittata* occur only in India and are good example for historical connections between the faunas of Indian Subcontinent and Afrotropical Region.

Genus: *Laccoptera* BOHEMAN, 1855

Laccoptera BOHEMAN, 1855: 55 (type species: *Laccoptera excavata* BOHEMAN, 1855, designated by MAULIK, 1919); CHAPUIS, 1875: 408; SPAETH, 1914 e: 82; HINCKS, 1952: 337; GRESSITT, 1952: 470; GRESSITT et KIMOTO, 1963: 955; SEENO et WILCOX, 1982: 176; CHEN et al., 1986: 572; BOROWIEC, 1992: 158, 1994 a: 11, 129 (nominotypical subgenus only in Africa).

- Patrisma* FAIRMAIRE, 1891: 272 (type species: *Lacoptera murrayi* BOHEMAN, 1862 = *Patrisma pyramidalis* FAIRMAIRE, 1891, by monotypy); SPAETH, 1914 e: 81 (as genus); HINCKS, 1952: 337 (as subgenus); SEENO et WILCOX, 1982: 176, subgenus (Africa).
- Sindia* WEISE, 1897: 105 (type species: *Cassida sulcata* OLIVIER, 1808 = *Cassida clathrata* FABRICIUS, 1798 nec LINNAEUS, 1758, by monotypy); SPAETH, 1914 e: 81 (as genus of); GRESSITT, 1952: 468; HINCKS, 1952: 337 (as genus); GRESSITT et KIMOTO, 1963: 954; SEENO et WILCOX, 1982: 175 (as genus); CHEN et al., 1986: 567, subgenus (Orient).
- Asphalesia* WEISE, 1899: 246 (type species: *Asphalesia confragosa* WEISE, 1899, designated by SPAETH, 1914 e); SPAETH, 1914 e: 82 (as subgenus of *Patrisma* FAIRMAIRE, 1891); HINCKS, 1952: 337 (as subgenus of *Lacoptera*); SEENO et WILCOX, 1982: 176, subgenus (Madagascar).
- Orphnoda* WEISE, 1899: 247 (type species: *Lacoptera cancellata* BOHEMAN, 1855, designated by HINCKS, 1952); SPAETH, 1914 e: 84 (as subgenus of *Lacoptera*); SEENO et WILCOX, 1982: 176, subgenus (Africa).
- Orphonoda* [sic]: BOROWIEC, 1992: 158, 1994 a: 130, 171.
- Orphonodella* SPAETH, 1902 b: 20 (type species: *Lacoptera cicatricosa* BOHEMAN, 1855 = *Cassida abyssinica* BOHEMAN, 1856, designated by HINCKS, 1952); SPAETH, 1914 e: 84 (as subgen. of *Lacoptera*); HINCKS, 1952: 337 (as subgenus); SEENO et WILCOX, 1982: 176, subgenus (mostly Africa, two species in Oriental Region).
- Orphonodella* [sic]: BOROWIEC, 1992: 158, 1994 a: 130, 178.
- Sindiola* SPAETH, 1903 b: 111 (type species: *Sindiola (Aspidomorpha) parallelepennis* SPAETH, 1903, by monotypy); SPAETH, 1914 e: 81 (as genus); GRESSITT, 1952: 469; HINCKS, 1952: 337 (as genus); GRESSITT et KIMOTO, 1963: 955; SEENO et WILCOX, 1982: 175 (as genus); CHEN et al., 1986: 568, subgenus (Orient).
- Parorphonoda* SPAETH, 1932 b: 228 [*Parorphonoda* in original description, error typogr.] (type species: *Lacoptera excavata* BOHEMAN, 1855, by original designation); HINCKS, 1952: 337 (as objective synonym of *Lacoptera* s. str.).
- Orphonodina* SPAETH, 1932 b: 229 (type species: *Orphonoda distans* SPAETH, 1902, designated by HINCKS, 1952); HINCKS, 1952: 337 (as subgenus); SEENO et WILCOX, 1982: 176, subgenus (Africa).
- Orphonodina* [sic]: BOROWIEC, 1992: 158, 1994 a: 130, 255.
- Indocassis* SPAETH in HINCKS, 1952: 345 (type species: *Cassida foveolata* BOHEMAN, 1856, by monotypy); SEENO et WILCOX, 1982: 176 (as subgenus of *Lacoptera*); BOROWIEC, 1992: 158 (as synonym of *Orphonodella* SPAETH, 1902).
- Lacopteroidea* SPAETH in HINCKS, 1952: 345 (type species: *Cassida tredecim-punctata* FABRICIUS, 1801, by monotypy); SEENO et WILCOX, 1982: 176, subgenus (Oriental and Australian Regions).
- Eulacoptera* HINCKS, 1952: 337 (new name for *Lacoptera* s. str. sensu SPAETH, 1932 not BOHEMAN, 1855, type species: *Cassida corrugata* SAHLBERG, 1823, by monotypy); SEENO et WILCOX, 1982: 176 (as subgenus of *Lacoptera* s. str.); BOROWIEC, 1992: 158 (as synonym of *Orphonodella* SPAETH, 1902).

Very heterogenous genus with numerous subgenera. Body elongate-oval to almost triangular. Elytral sculpture usually strong, puncturation coarse, surface of elytra often with costae, folds, and wrinkles. Pronotal disc often with wrinkles. Clypeus always convex, distinctly elevated before antennal insertions. Prosternal collar prominent. Claws usually with distinct pecten on inner margin only (outer pecten also distinct only in the subgenus *Sindiola*).

64 species hitherto described, mostly from Africa.

KEY TO THE ORIENTAL SUBGENERA

1. Claws with distinct inner pecten and very short or obsolete outer pecten (figs 781, 782, 793, 794, 868, 869).
..... 2.
- Claws with distinct pecten on both margins (figs 806, 807, 858, 859).
..... *Sindiola*
2. Body oval to elongate, almost parallel-sided, Elytral base only slightly wider than pronotum (figs 771, 778, 784, 790, 865).
..... 3.
- Body subtriangular to subtrapezoidal, rarely broadly oval, sides more or less converging posterad, Elytral base distinctly wider than pronotum (figs 607, 613, 645, 674).
..... *Laccopteroidea*
3. Elytral sculpture strong, with coarse punctures, wrinkles and costae (figs 777, 789).
..... 4.
- Elytra only with puncturation, without wrinkles or costae (fig. 864).
..... *Sindiolina*
4. Length above 10 mm. Elytra with double margination.
..... *Sindia*
- Length below 9 mm. Elytra with simple margination.
..... *Orphnodella*

Subgenus: *Laccopteroidea* SPAETH, 1952

Body subtriangular, subpentagonal or broadly oval, Elytral base wider than pronotum. Elytra, and often pronotum, with dark pattern. Elytral margination simple. Pronotal disc usually with puncturation or/and wrinkles, occasionally smooth and glabrous. Claws with distinct inner pecten and almost obsolete outer pecten.

15 species hitherto described, mostly from the Oriental Region, only one species from the Australian Region.

KEY TO SPECIES

1. Spots in anterior half of elytra form more or less complete transverse band (figs 613, 633). Borneo and Java.
..... 2.
- Elytra in anterior half without transverse band (figs 607, 609, 645, 674).
..... 3.
2. Elytral marginalia without sutural spot. In posterolateral part of elytra two spots (fig. 613). Distinct irregular striation of pronotal disc.
..... *discreta*

- Elytral marginalia with sutural spot. Posterolateral part of elytra with only one transverse spot (fig. 633). Pronotal disc without distinct sculpture, at most with fine pricks or barely visible folds.
..... *fasciata*
- 3. Elytral marginalia with sutural spot (figs 620, 626, 651-656, 674).
..... 4.
- Elytral marginalia without sutural spot (figs 607, 719, 749).
..... 18.
- 4. Small size, length below 9.5 mm. Apical part of aedeagus in profile straight (figs 657, 661, 663, 665).
..... 5.
- Large size, length above 9.7 mm. Apical part of aedeagus in profile S-shaped (fig. 669). India and Ceylon.
..... *quatuordecimnotata*
- 5. Humeral spots extend to anterior margin of marginalia (figs 681, 695).
..... 6.
- Humeral spots do not extend to anterior margin of marginalia or absent (figs 626, 639, 645, 762).
..... 7.
- 6. Large, length above 9 mm. Postscutellar tubercle prominent (fig. 696). Only Mindoro Island of the Philippines.
..... *schantzei*
- Small, length below 9 mm. Postscutellar tubercle less prominent (fig. 682). Only Yunnan province in S China.
..... *prominens*
- 7. Marginalia without humeral spots (fig. 762).
..... 8.
- Marginalia with humeral spots more or less marked.
..... 9.
- 8. Ground colour of elytra reddish-brown. Body oval, Elytral base moderately wider than pronotum. Elytral sculpture very deep, with numerous folds, wrinkles, and costae of rugose appearance.
..... *yunnanica*
- Ground colour of elytra yellow to yellowish-brown. Body subtriangular, elytral base distinctly wider than pronotum. Elytral sculpture moderate, without transverse folds or wrinkles, not rugose. Rare aberration with reduced humeral spots.
..... *nepalensis*
- 9. Species from continent and neighbouring islands.
..... 10.
- Species from Sunda Is. and Moluccas.
..... 12.
- 10. Ground colour of elytra yellow to yellowish-brown. Body subtriangular, elytral base distinctly wider than pronotum. Elytral sculpture moderate, without transverse folds or wrinkles, not rugose.
..... 11.

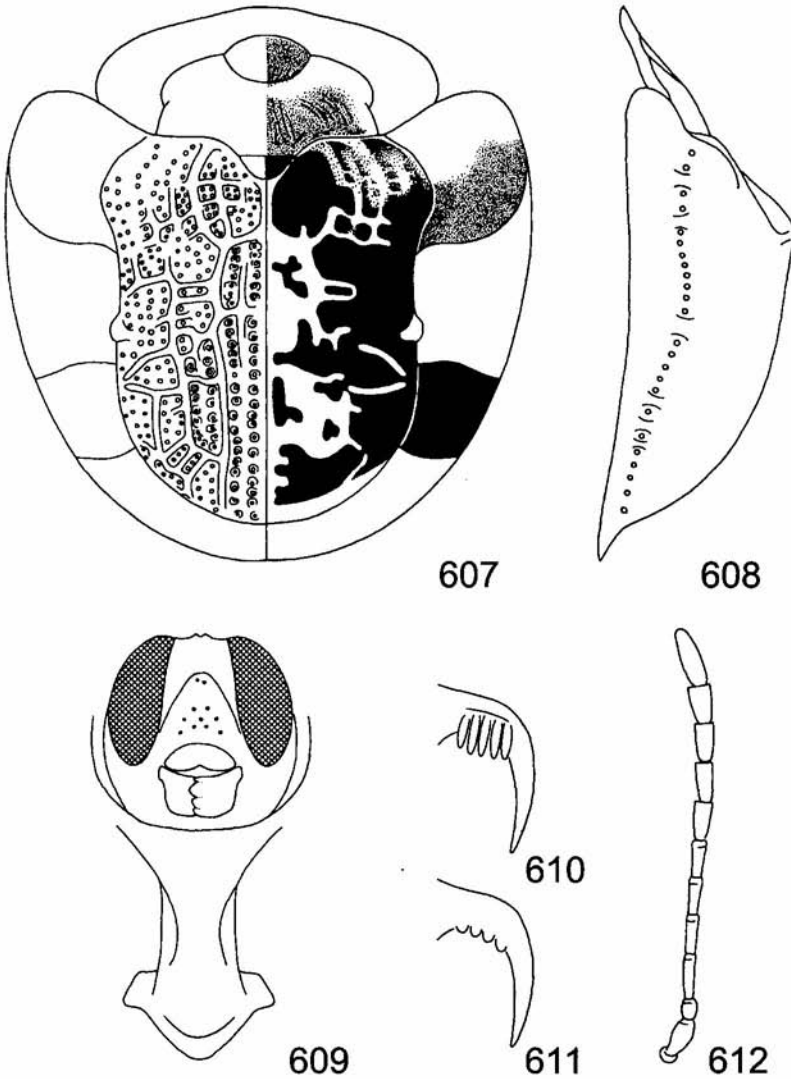
- Ground colour of elytra reddish-brown. Body oval, Elytral base moderately wider than pronotum. Elytral sculpture very deep, forms numerous folds, wrinkles, and costae, appears rugose. Rare aberration with distinct humeral spots.
..... *yunnanica*
- 11. Humeral extend to humeral angles (fig. 639). Postscutellar elevation low. Third interval only slightly convex, indistinctly higher from remaining intervals. Abdomen mostly black with yellow margins. Ground colour of elytra straw yellow.
..... *fruhstorferi*
- Humeral spots do not extend to humeral angles (fig. 645). Postscutellar elevation high. Third interval distinctly convex on whole length and fifth interval convex at least in the middle, both more convex than neighbouring intervals. Abdomen usually uniformly yellow, occasionally bases of sternites infusate. Groundcolour of elytra yellow to yellowish-brown.
..... *nepalensis*
- 12. Spots on pronotal disc small, widely separated from basal margin of pronotum (fig. 620, 626, 674, 701), sometimes obsolete. Usually insular endemics.
..... 13.
- Spots on pronotal disc large, usually extending to basal margin of pronotum or separated from the margin by a narrow line (fig. 707). Widespread species in southern Sunda Is., from Sumatra to Flores.
..... *sedecimnotata*
- 13. Abdomen black in the middle.
..... 14.
- Abdomen yellow in the middle.
..... 16.
- 14. Body stout, L/W = 1,14-1,20, subtrapezoidal, distinctly convex in postscutellar area. Inner pecten of fore claws extends at least to 1/4 length of the claw (figs 623, 629, 716).
..... 15.
- Body slim, L/W = 1,20-1,29, oval, indistinctly convex in postscutellar area. Inner pecten of fore claws very short, reaches only slightly beyond margin of the claw (fig. 677). Endemic to Timor and Wetter (Wetar) islands. Form from Timor with partly black abdomen.
..... *permodica*
- 15. Larger, length above 8.5 mm. Elytral marginalia broader and less declivous than in *L. fallax*, humeral angles distinctly marked. Only one black spot in apical part of each elytron. Endemic to Sumba.
..... *sutteri*
- Smaller, length below 8.1 mm. Elytral marginalia narrower and much declivous than in *L. sutteri*, humeral angles indistinctly marked. Two or three black spots in apical part of each elytron. Endemic to Tenimber (= Tanimbar, Larat) and Timor.
..... *fallax*

16. Ground colour of elytra yellow to yellowish-brown. Anterior margin of pronotum regularly rounded, maximum width of pronotum approximately in the middle. Surface of pronotal disc usually distinctly punctate or wrinkled, rarely smooth and glabrous. Species outside Sulawesi.
..... 17.
- Ground colour of elytra reddish-brown. Anterior margin of pronotum only slightly rounded, maximum width of pronotum in front of the middle. Surface of pronotal disc usually impunctate or finely punctate, dull. Endemic to Sulawesi (= Celebes).
..... *sculpturata*
17. Slimm, L/W = 1.20-1.29, body more oval, sides softly converging posterad. Elytra with small but numerous black spots. Inner pecten of fore claws very short, reaches only slightly beyond margin of the claw (fig. 677). Form from Wetter (Wetar).
..... *permodica*
- Stout, L/W = 1.14-1.20 (occasionally to 1.25), more trapezoidal, sides abruptly converging posterad. Elytra with large but not numerous black spots. Inner pecten of fore claws extends at least to 1/4 length of the claw (figs 623, 629). The form from Tenimber with uniformly yellow abdomen.
..... *fallax*
18. Humeral spots, if present, narrow and do not extend to lateral margin of marginalia (figs 719, 749). Elytral disc usually maculate on reddish ground colour. Species generally from Sunda Is. and Philippines (some records from the continent are probably based on introduced specimens).
..... 19.
- Humeral spots very broad and extend to lateral margin of marginalia (fig. 607). Elytral disc mostly dark brownish, without distinct spots. Only Guizhou province in S China.
..... *cheni*
19. Elytral puncturation very regular, also on sides and posterolateral part of disc, although additional punctures in posterolateral part of disc may slightly disturb the regularity. Elytral spots usually smaller and more irregular in shape. Elytral disc never black. Sunda Is. and Philippines, records also from a few localities in India, Indochina, and S China, are probably based on introduced specimens.
..... *tredecimpunctata*
- Elytral puncturation partly irregular, especially on sides and posterolateral part of disc, sometimes whole posterolateral part of disc irregularly punctured. Elytral spots usually larger and more regular, circular or oval. Elytral disc often partly or mostly black. Species exclusively from the Philippines.
..... *tredecimguttata*

Laccoptera (Laccopteroidea) cheni n. sp.
(figs 607-612, 809, 810, tab. 17: 7)

ETYMOLOGY

Dedicated to the late Prof. Sicien CHEN, author of the excellent monograph of Chinese cassids.



607-612. *Laccoptera cheni*: 607 - body in dorsal view, 608 - body in lateral view, 609 - head and prosternum, 610 - inner side of claw, 611 - outer side of claw, 612 - antenna

DIAGNOSIS

Very distinct species. At first glance to species of *L. nepalensis* group, especially to dark forms of *L. nepalensis* and to *L. prominens* and *L. schultzei*, but differs from all species of the group in lacking sutural spot on marginalia. *L. cheni* is the largest species of the group, the only with length exceeding 10 mm.

DESCRIPTION

$L = 10.1$; $W = 9.4$; $Lp = 3.4$; $Wp = 5.95$; $L/W = 1.07$; $Wp/Lp = 1.75$. Body very broad, subtriangular (fig. 607). Sexual dimorphism unknown, the only examined specimen was male.

Pronotum yellowish-brown, slightly darker at basal margin, disc in the middle with two small, indistinct, brown spots. Scutellum dark brown. Elytral disc mostly dark brown to black, only humeri yellowish brown, and some intervals and elevated folds in central part of disc and on its sides and slope yellowish. Explanate margin yellowish, with broad, dark brown posterolateral spots and large humeral spots, which become gradually darker from anterior to posterior margin, but remain distinctly paler than posterolateral spots. No sutural spot (fig. 607). Ventrites mostly yellowish-brown, only metathorax black, except for yellowish lateral plates. Legs yellowish-brown. Antennal segments 1-7 yellowish-brown, last four segments completely black.

Pronotum elliptical, 1.75 times wider than long, with maximum width approximately in the middle, sides rounded. Disc moderately convex. Basal part of disc with strong, irregular wrinkles and folds, area above head also with wrinkles but lower than in basal part of disc, explanate margin with radial wrinkles of irregular appearance.

Elytral base distinctly wider than base of pronotum. Humeral angles rounded, protrude anterad. Disc unevenly convex, with blunt postscutellar tubercle, which is lower than in related *L. prominens* and *L. schultzei* (fig. 608), deep postscutellar impressions, and shallower principal impressions. Surface of elytra strongly sculptured. Puncturation coarse and very dense, with punctures almost touching each other. Spaces between punctures elevated, as numerous, transverse wrinkles. Intervals on sides barely marked, linear, in sutural half of disc only intervals 1, 3, and 5 well marked, but narrower than rows, 3rd costa distinctly elevated. Apex of elytral epipleura with short, sparse hairs.

Clypeus 1.5 times wider than long, apex with an angulate elevation. Labrum broad, emarginate to 1/6 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, only with a shallow impression in the middle (fig. 609).

Length ratio of antennal segments: 100: 50: 100: 90: 85: 85: 80: 90: 90: 90: 140, segment 3 approximately twice longer than segment 2 and slightly longer than segment 4 (fig. 612).

Claws with short inner pecten, and five teeth extending to 1/4 length of claw (fig. 610). Outer pecten with four short teeth extends only slightly behind margin of claw (fig. 611).

Aedeagus moderately broad, slightly widened at 2/3 apical length, sides carinate. Apex truncate, without apical process. Apical part distinctly curved ventrad. Ventral side without membrane (figs 809, 810).

TYPE MATERIAL

Holotype: "CHINA, Guizhou, 60 km N of Kaili, Shibing-Yuntai Shan, 21-26 V 1995, E. Jendek & O. Sausa leg." (LB).

DISTRIBUTION

China: Guizhou.

***Laccoptera (Laccopteroidea) discreta* BOHEMAN, 1855**

(figs 613-619, tab. 15: 1)

Laccoptera discreta BOHEMAN, 1855: 77; 1856: 156; 1862: 386; GEMMINGER and HAROLD, 1876: 3662; BOROWIEC, 1990 a: 702; KIMOTO et al., 1995: 107 (incl. photo).

Laccoptera (Laccoptera) discreta: SPAETH, 1914 c: 82.

Laccoptera (Laccopteroidea) discreta: BOROWIEC, 1999: 218.

DIAGNOSIS

L. discreta and *L. fasciata* are the only species of the subgenus *Laccopteroidea*, in which spots in anterior part of elytral disc tend to form more or less complete transverse band. *L. discreta* differs in striate surface of pronotum (in *L. fasciata* it is smooth), spots in posterior part of disc not connected with posterolateral spots on explanate margin (in *L. fasciata* they are connected), and in absence of sutural spot on explanate margin (present in *L. fasciata*). In *L. discreta* puncturation of elytral disc is finer and less regular, especially in posterior part of disc, than in *L. fasciata*. Humeral angles are acute in *L. discreta*, and obtuse in *L. fasciata*.

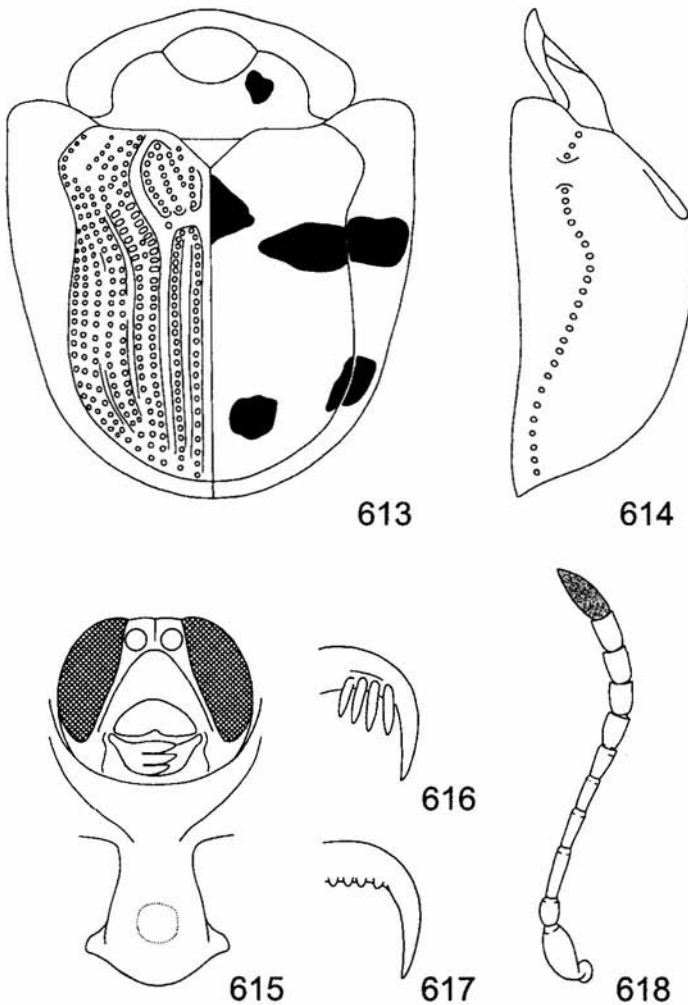
DESCRIPTION

L = 7.6; W = 6.1; Lp = 2.5; Wp = 4.2; L/W = 1.24; Wp/Lp = 1.68. Body slightly triangular (fig. 613). Sexual dimorphism unknown, two available specimens were females.

Pronotum yellow to yellowish-brown with two black spots separated from base of pronotum. Scutellum yellowish-brown. Elytral disc yellowish-brown with a black pattern composed of a rhomboidal spot extending to third interval in the postscutellar area, circular spot in posterior part of disc between intervals 2 and 4, and a transverse band at 1/3 length of disc, extending from third interval to border of disc, where it connects with humeral spots on explanate margin of elytra. The transverse band sometimes connects with the spot in the postscutellar area. Explanate margin with humeral and posterolateral spots, without sutural spot, humeral spots of long distance from basal margin of elytra (fig. 613). Spot on marginalia do not extend to the extreme margin of elytra. Ventrites yellow with black spot on metathorax. Legs yellow. Antennae yellow, last segment infusate.

Pronotum elliptical, 1.68 times wider than long, with maximum width at half length, sides rounded. Disc moderately convex. Surface of disc distinctly sculptured, with fine and dense longitudinal striation. Surface of explanate margin slightly irregular.

Elytral base wider than base of pronotum. Humeral angles slightly protrude anterad, distinctly angulate, margin behind angles shallowly emarginate. Disc regularly convex, only slightly elevated in the postscutellar area, without tubercles (fig. 614), but with distinct postscutellar impressions. Puncturation moderately coarse, dense, regular, but rows tend to become irregular in posterolateral part of disc. Spaces between punctures and intervals slightly elevated. Intervals in sutural half of disc approximately twice wider than rows, on sides of disc as wide as or slightly narrower than rows. Apex of elytral epipleura bare. One of two examined specimens has elytral surface covered with very short, erect setae, which may be an immature character (see remarks to *L. fallax*).



613-618. *Laccoptera discreta*: 613 - body in dorsal view, 614 - body in lateral view, 615 - head and prosternum, 616 - inner side of claw, 617 - outer side of claw, 618 - antenna

Clypeus 1.7 times wider than long, strongly convex, especially on the top. Labrum broad, emarginate to 1/5-1/4 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, with shallow impression in the middle (fig. 615).

Length ratio of antennal segments: 100: 46: 86: 66: 63: 53: 53: 56: 60: 113, segment 3 approximately 1.9 times longer than segment 2 and approximately 1.3 times than segment 4 (fig. 618).

Claws with distinct inner pecten, with four teeth extending to half length of claw (fig. 616), outer pecten barely marked, with four teeth only slightly extending beyond the margin of claw (fig. 617).

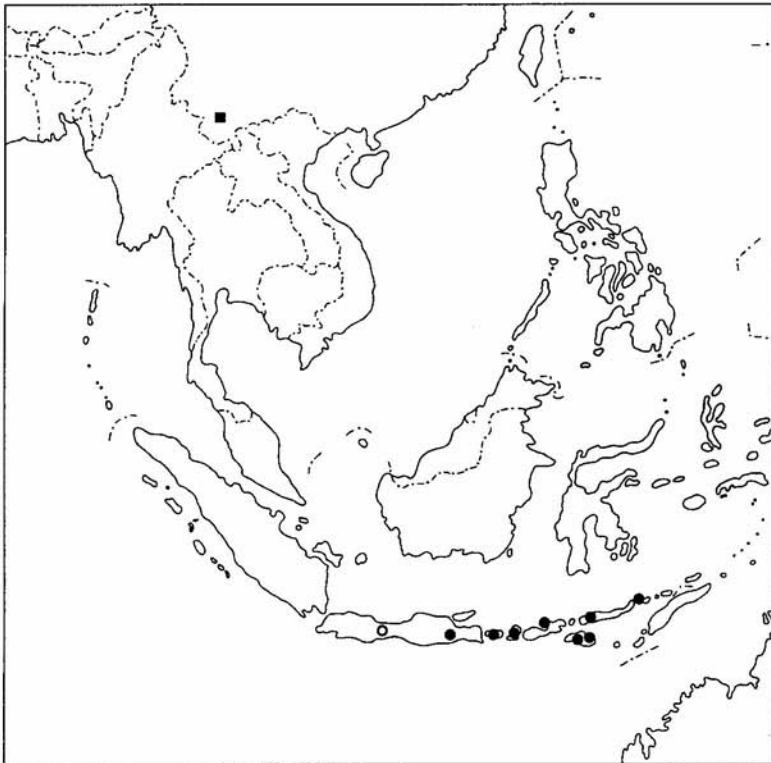
Aedeagus has not been examined. Two available specimens were females.

TYPE MATERIAL

Type not found. According to BOHEMAN (1855), the original description is based on the material from ZMHU, but this collection has no specimens of this species.

DISTRIBUTION

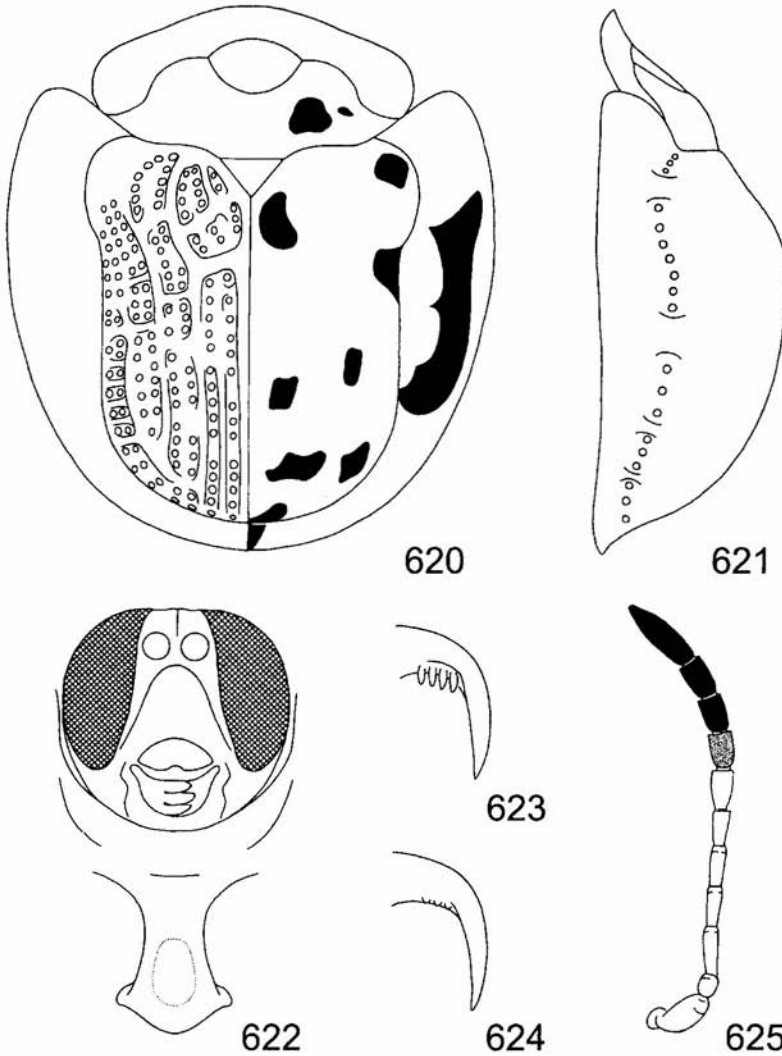
Indonesia: Java (fig. 619).



619. Distribution of *Laccoptera discreta* (white circles), *L. sedecimnotata* (black circles) and *L. yunnanica* (black squares)

***Laccoptera (Laccopteroidea) fallax* WEISE, 1910**

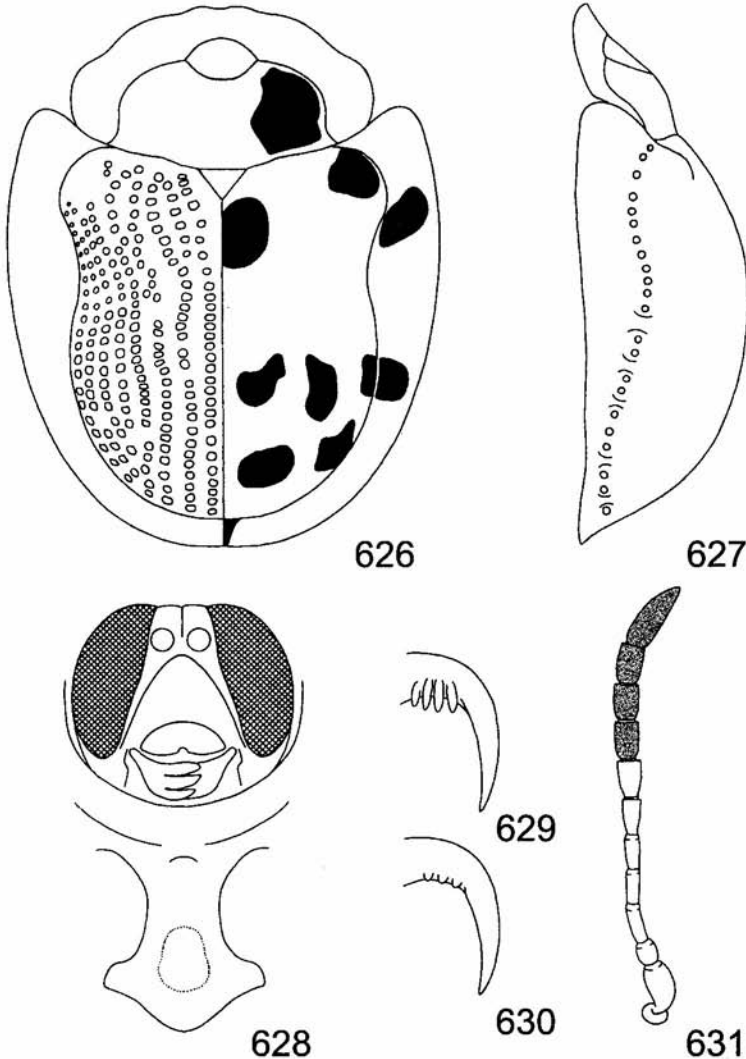
(figs 620-632, 657-660, tab. 16: 7, 8)

Laccoptera fallax WEISE, 1910 a: 145; HINCKS, 1953: 71; BOROWIEC, 1987 b: 414.*Laccoptera (Laccoptera) fallax*: SPAETH, 1914 e: 82.*Laccoptera (Laccopteroidea) fallax*: BOROWIEC, 1999: 218.*Laccoptera timorensis* SPAETH, 1926 d: 7; BOROWIEC, 1996: 37, n. syn.*Laccoptera (Laccopteroidea) timorensis*: BOROWIEC, 1999: 220.

620-625. *Laccoptera fallax*: 620 - body in dorsal view, 621 - body in lateral view, 622 - head and prosternum, 623 - inner side of claw, 624 - outer side of claw, 625 - antenna

DIAGNOSIS

L. fallax belongs to the group of species from eastern part of Sunda Is. with oval or slightly trapezoidal body and sutural spot on explanate margin of elytra. The group also includes *L. sutteri* and *L. permodica*. *L. sutteri* differs in distinctly larger body (length above 8.5 mm, up to 8.0 mm in *L. fallax*), wider explanate margin of elytra, and strongly marked humeral angles. *L. sutteri* has only one and *L. fallax* has two or three spots in posterior part of elytral disc.



626-631. *Laccoptera fallax*, form from Timor: 626 - body in dorsal view, 627 - body in lateral view, 628 - head and pronotum, 629 - inner side of claw, 630 - outer side of claw, 631 - antenna

L. sutteri has abdomen always infusate in the middle, while only the Timorese forms of *L. fallax* have abdomen partly black. *L. permodica* differs in slimmer, more oval body (L/W 1.20-1.29, in *L. fallax* 1.14-1.20) and extremely short inner pectens of claws extending slightly behind border of claw (in *L. fallax* inner pecten of claws extends 1/4 length of claw at least in front tarsi).

Description

L = 6.3-8.0; W = 5.5-7.0; Lp = 1.8-2.3; Wp = 3.7-4.7; L/W = 1.14-1.25; Wp/Lp = 1.90-2.11. Body slightly trapezoidal (fig. 620). Antennae dimorphic, especially their last segment is distinctly longer in male than in female.

Pronotum yellow or yellowish-brown with two, black spots on the top of disc, separated from base of pronotum (fig. 626). Each of pronotal spot is sometimes divided into two spots, a larger medial, and a smaller lateral (fig. 620). Occasionally, two additional spots occur at basal margin of pronotum. Scutellum yellow or yellowish-brown. Elytral disc yellow or yellowish-brown with a black pattern composed of a spot in postscutellar impressions, extending to third interval, a spot on intervals 2-3 at 2/3 length of disc, a spot between intervals 5-7 at 2/3 length of disc, a spot between intervals 1-5 at 5/6 length of disc, a spot on interval 1 on the apex of disc, which is connected with the sutural spot on explanate margin, a spot on the top of humeral callus, a spot behind humeral callus, extending from interval 5 to the border of disc, a spot at the border of disc, at its 2/3 length, which is connected with posterolateral spots on explanate margin, and an elongate spot on intervals 8-9 at 5/6 length of disc (figs 620, 626). Explanate margin with humeral, posterolateral, and sutural spots. Humeral spots far from the anterior margin of marginalia (fig. 626). Humeral spots sometimes connected with posterolateral spots by an elongate band running along external part of marginalia (fig. 620). The pattern is quite constant, only size of spots is variable. Colouration of ventrites varies geographically. Forms from Larat Is. (= Tenimber) and Toekam Besi Is. (= Tomia) have ventrites mostly yellow, with two black spots on metathorax. Forms from Timor have ventrites mostly black except for yellow prosternal process, lateral plates of thorax, spot in the middle of metathorax, and margins of abdomen. The whole ventrites are black in extremely dark forms from Timor. Legs yellow, only in extremely dark forms from Timor the basal third of femur is blackish. Antennae mostly yellow, last four segments black.

Pronotum elliptical, 1.90-2.11 times wider than long, with maximum width in the middle, sides moderately rounded. Disc moderately convex. Forms from Larat and Toekam Besi usually have the surface of disc smooth or with fine puncturation; forms from Timor have the surface of disc, especially black spots, with distinct punctures, sometimes and the middle of disc surface is slightly irregular or with very fine, barely marked striation.

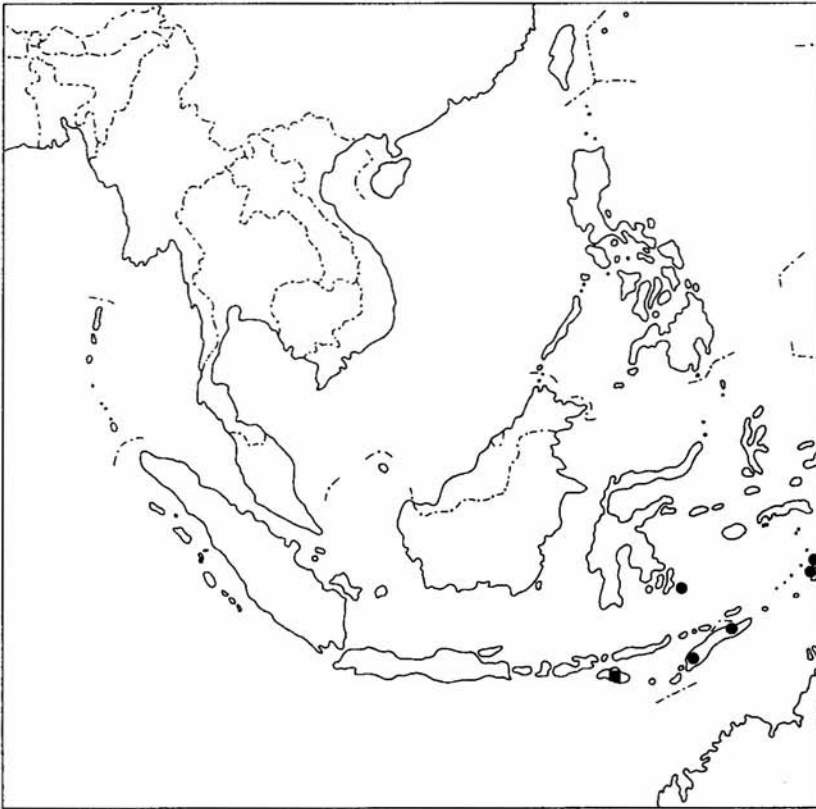
Elytral base wider than base of pronotum. Humeral angles obtuse to angulate, protrude anterad. Disc regularly convex, only slightly elevated in the postscutellar area, without tubercles, only with postscutellar impressions (figs 621, 627). Puncturation coarse and regular. Spaces between punctures elevated. Intervals

elevated, especially intervals 3 and 5, but in some specimens from Timor intervals almost flat. Intervals usually slightly narrower than rows. Fresh immature specimens have the surface of elytra covered with very short, erect setae. Apex of elytral epipleura with sparse, erect hair. In dried specimens hair often broken off and the epipleura look bare.

Clypeus 1.5 times wider than long, convex, apex angulate. Labrum broad, emarginate to 1/4 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, with shallow impression in the middle (figs 622, 628).

Length ratio of antennal segments: 100: 39: 81: 67: 69: 63: 67: 66: 66: 70: 141, segment 3 approximately 2.1 times longer than segment 2 and approximately 1.2 times than segment 4 (figs 625, 631).

Claws with pecten on both sides. Inner pecten short, with four teeth extending to 1/5-1/4 length of claw (figs 623, 629), outer pecten barely visible, with three teeth only slightly extending beyond the margin of claw (figs 624, 630).



632. Distribution of *Laccoptera fallax* (black circles) and *Laccoptera sutteri* (black squares)

Aedeagus slim, slightly narrowed basally, in forms from Timor the apical part slightly more widened than in forms from Larat. Apex truncate, without apical process. Apical part gently curved ventrad. Ventral side without membrane (figs 657- 660).

TYPE MATERIAL

Lacoptera fallax: lectotype: "Lartat-Is., Tenimber Is." (ZMHU) – designated by BOROWIEC (1987 b); paralectotype: "Larat Is. (Tenimber Is.)" "cotype" (MM). In ZMHU collection there are 17 specimens with the same label as holotype. Probably part of them belong to type series.

Lacoptera timorensis: syntype: "Timor M. Leiden" "timorensis m. cotypus SPAETH det." "Co-typus" (MM).

DISTRIBUTION

Indonesia: Tenimber [= Tanimbar, Larat], Timor (fig. 632).

REMARKS

In the diagnosis of *L. timorensis* SPAETH (1926) suggested that this species is well distinguished by its pubescent elytra, but noted in the discussion that one of syntypes had the elytra bare. After my study of the types and a long series of the specimens from Tenimber and Timor I conclude that the description of *L. timorensis* based on immature specimens. Fresh, incompletely sclerotized specimens from Timor (syntypes of *L. timorensis* have partly deformed, not fully coloured elytra) have short, erect hair, but completely sclerotized specimens have the elytra bare. I observed similar situation in *L. tredecimpunctata*, whose immature specimens in some populations from the Philippines have the elytra setose, while fresh specimens from Indonesia and partly from the Philippines are bare, like the adults. Populations from Timor also differ in more darker ventrites and slightly more widened apical part of aedeagus. Most probably, they represent only an extreme geographic form of *L. fallax*, which is a variable, insular species. Therefore I synonymized *L. timorensis* with *L. fallax*.

Lacoptera (Lacopteroidea) fasciata BOHEMAN, 1862

(figs 633-638, tab. 15: 2)

Lacoptera fasciata BOHEMAN, 1862: 385; GEMMINGER and HAROLD, 1876: 3662.

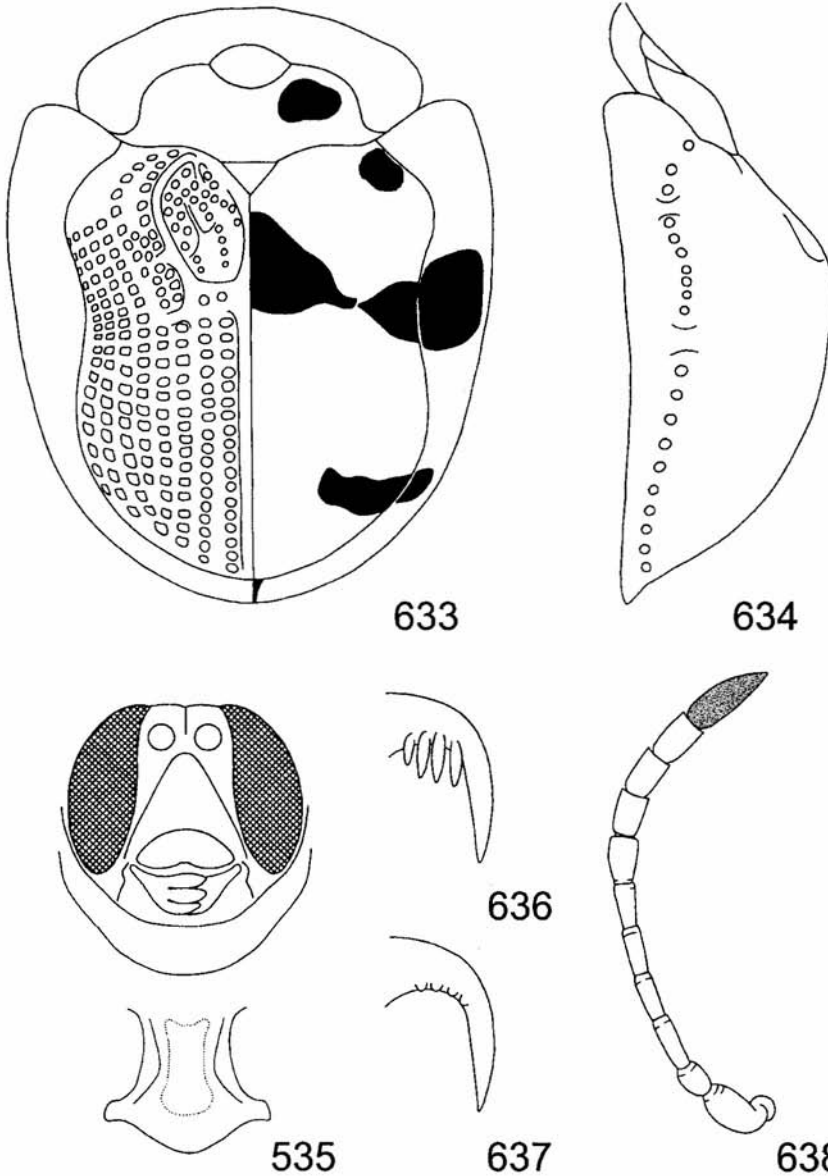
Lacoptera (Lacoptera) fasciata: SPAETH, 1914 e: 82.

Lacoptera (Lacopteroidea) fasciata: BOROWIEC, 1999: 218.

DIAGNOSIS

L. fasciata and *L. discreta* are the only species of the subgenus *Lacopteroidea*, in which spots in the anterior part of elytral disc tend to form more or less complete transverse band. *L. fasciata* differs in glossy surface of pronotum (distinctly striated in *L. discreta*), spots in posterior part of disc connected with

posterolateral spots on explanate margin (not connected in *L. discreta*), and presence of sutural spot on explanate margin (absent sutural spot in *L. discreta*). Puncturation of elytral disc is coarser and more regular in *L. fasciata* than in *L. discreta*. Humeral angles are obtuse in *L. fasciata* and sharp in *L. discreta*.



633-638. *Laccoptera fasciata*: 633 - body in dorsal view, 634 - body in lateral view, 635 - head and prothorax, 636 - inner side of claw, 637 - outer side of claw, 638 - antenna

DESCRIPTION

L = 7.7-7.9; W = 6.3-6.4; Lp = 2.5; Wp = 4.2-4.3; L/W = 1.20-1.25; Wp/Lp = 1.68-1.72. Body slightly triangular (fig. 633). Sexual dimorphism unknown, all examined specimen were females.

Pronotum yellowish-brown with two black spots separated from basal margin of pronotum. Scutellum yellowish-brown. Elytral disc yellowish-brown with a black spot in the postscutellar area, a spot on humeral callus, two transverse spots located on sides of disc at 1/3 and 2/3 length of disc, extending from interval 3 to border of disc, and connected with spots on explanate margin of elytra, and a small spot located at the apex of disc on interval 1 and connected with a sutural spot on the explanate margin of elytra. Explanate margin of elytra with humeral, posterolateral and sutural spots. Humeral spots far from the anterior margin of marginalia, do not extend to the lateral margin of marginalia (fig. 633). Ventrites yellow, with two black spots on metathorax. Legs yellow. Antennae yellow, last segment infuscate.

Pronotum elliptical, 1.68-1.72 times wider than long, with maximum width at half length, sides rounded. Disc moderately convex. Surface of disc smooth, or with indistinct small, shallow impressions and few sparse punctures. Surface of explanate margin slightly irregular.

Elytral base distinctly wider than base of pronotum. Humeral angles angulate, moderately protrude anterad. Disc almost regularly convex, only slightly elevated in the postscutellar area, without tubercles (fig. 634), but with distinct postscutellar impressions. Puncturation of disc coarse and regular, spaces between punctures and intervals slightly elevated. Intervals as wide as punctures or slightly narrower, only interval 2 in posterior part of disc slightly wider than punctures, and stronger elevated than other intervals. Apex of elytral epipleura bare.

Clypeus 1.4 times wider than long, strongly convex, especially its top. Labrum broad, emarginate to 1/5-1/4 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, with a shallow impression in the middle (fig. 635).

Length ratio of antennal segments: 100: 86: 71: 71: 68: 64: 61: 64: 71: 136, segment 3 approximately 1.7 times longer than segment 2 and approximately 1.2 times than segment 4 (fig. 638).

Claws with distinct inner pecten, with four teeth extending to half length of claw (fig. 636), outer pecten barely marked, with four teeth extending only to the ventral margin of claw (fig. 637).

Aedeagus has not been examined, as all available specimens were females.

TYPE MATERIAL

Holotype: "Borneo" "Bhn" "Type" (NRS).

DISTRIBUTION

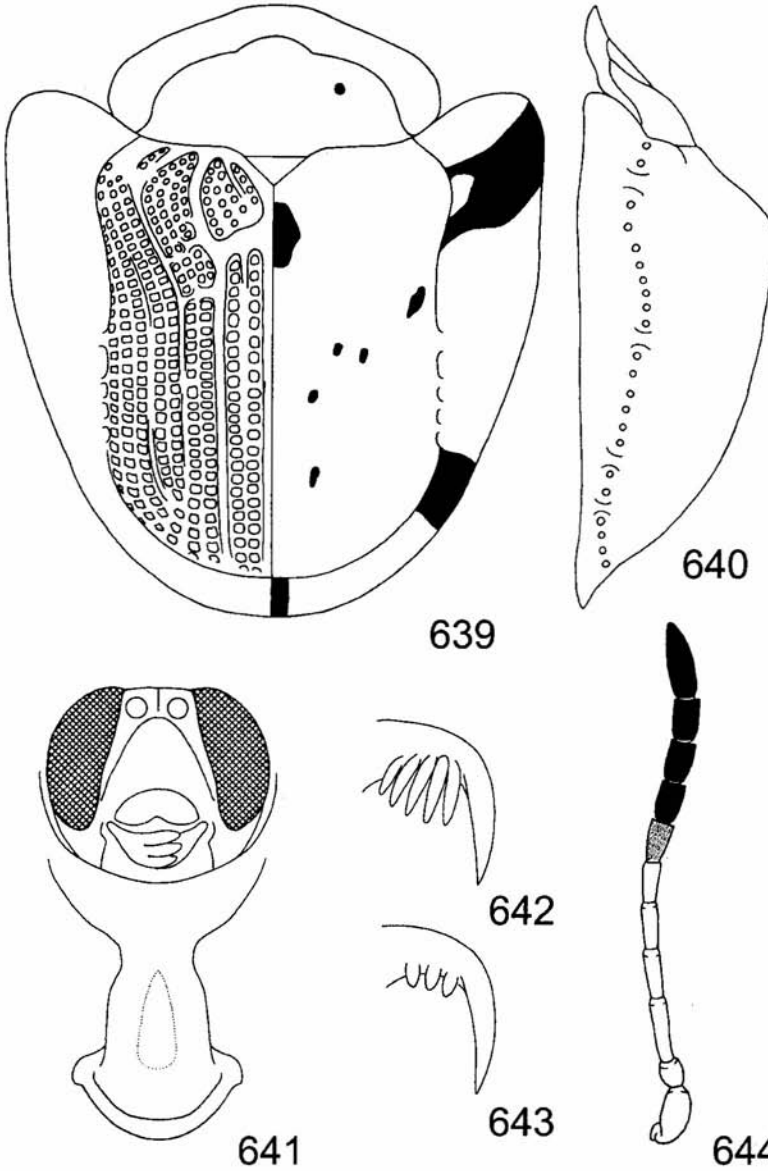
Indonesia: Borneo.

***Laccoptera (Laccopteroidea) fruhstorferi* SPAETH, 1905**
(figs 639-644, 667, 668, 694, tab. 16: 6)

Laccoptera Fruhstorferi SPAETH, 1905: 117; MAULIK, 1919: 350.

Laccoptera (Laccoptera) Fruhstorferi: SPAETH, 1914 c: 82.

Laccoptera (Laccopteroidea) fruhstorferi: BOROWIEC, 1999: 218.



639-644. *Laccoptera fruhstorferi*: 639 - body in dorsal view, 640 - body in lateral view, 641 - head and prosternum, 642 - inner side of claw, 643 - outer side of claw, 644 - antenna

Laccoptera quadrimaculata var. *plagiograpt* MAULIK, 1919: 349; BOROWIEC, 1999: 218 (as syn.).
Laccoptera plagiograpt: CHEN et ZIA, 1961: 441; YU, 1983: 795; CHEN et al., 1986: 573, 635, pl. XIII (incl. colour fig.); BOROWIEC, 1996: 36.

DIAGNOSIS

L. fruhstorferi and *L. nepalensis* form group of species with the most triangular body, sutural spot on explanate margin of elytral disc, and humeral spots always separated from the anterior border of explanate margin. In *L. fruhstorferi* ground colour of elytron is paler (straw yellow) than in *L. nepalensis* (yellow to yellowish-brown). In *L. fruhstorferi* humeral spots on explanate margin of elytra are arranged more oblique and extend to humeral angles, while in *L. nepalensis* these spots never extend to humeral angles. Abdomen is almost completely black in *L. fruhstorferi*, and usually yellow or only with infusate basal margins of sternites in *L. nepalensis*. In *L. fruhstorferi* almost all intervals are only slightly elevated, and interval 3 is only slightly more convex than others, while in *L. nepalensis* interval 3 usually forms an elongate costa and interval 5 is at least in the middle more convex than the neighbouring intervals.

DESCRIPTION

L = 7.7-8.5; W = 6.5-7.3; Lp = 2.1-2.3; Wp = 4.0-4.5; L/W = 1.12-1.21; Wp/Lp = 1.18-2.05. Body triangular (fig. 639). Antennae dimorphic, especially the last segment in male is distinctly longer than in female.

Pronotum yellow, in the middle with two, small, round, black spots, sometimes reduced to two black points. Scutellum yellow. Elytral disc yellow with black spots: large in the postscutellar area, two small on interval 3, at 3/5 and 4/5 length of disc, small at half length of interval 5, and small, elongate on the side of disc, sometimes connected with humeral spots on explanate margin of elytra. Explanate margin with humeral, posterolateral and sutural spots. Humeral spots separated from the basal margin of elytra (fig. 639), are arranged oblique and extend to humeral angle. Basal part of each humeral spot usually with a small yellow spot. Ventrites black except for yellow margin of abdomen. Legs yellow. Antennae yellow, last four (sometimes five) segments black.

Pronotum ellyptical, 1.82-2.05 times wider than long, with maximum width at 1/3 basal length, sides rounded. Disc moderately convex. Surface of pronotum distinctly sculptured, with more or less regular longitudinal striation and folds.

Elytral base distinctly wider than base of pronotum. Humeral angles angulate, distinctly protrude anterad. Disc slightly irregularly convex, slightly elevated in the postscutellar area, without tubercles (fig. 640), but with distinct H-shaped postscutellar elevation, and with deep postscutellar impressions. Surface of elytra strongly sculptured. Puncturation coarse and regular, punctures almost touching each other. Spaces between punctures elevated. Intervals slightly, uniformly elevated, only interval 3 forms a blunt costa, only slightly higher than neighbouring intervals. Intervals only slightly narrower than rows in sutural half of disc, and very narrow, linear on the sides of disc. Apex of elytral epipleura with sparse hair.

Clypeus 1.5 times wider than long, strongly elevated at the top, without impressions. Labrum broad, emarginate to 1/5 length. Mandibles with distinct teeth. Prosternal process moderately wide, with a deep impression in the middle (fig. 641).

Length ratio of antennal segments: 100: 42: 104: 81: 77: 65: 65: 65: 69: 69: 123, segment 3 approximately 2.5 times longer than segment 2 and approximately 1.3 times than segment 4 (fig. 644).

Claws with distinct inner pecten, its five teeth extending to half length of claw, last tooth shorter than others (fig. 642); outer pecten with three, very short teeth extending to 1/5 length of claw (fig. 643).

Aedeagus slim, slightly narrowed basally. Apex truncate, without apical process. Apical part gently curved ventrad. Ventral side without membrane (figs 667, 668).

TYPE MATERIAL

Laccoptera fruhstorferi: syntype: "Tenasserim Tandong 4000' Mai Fruhstorfer leg." "Fruhstorferi m. Type" (MM).

Laccoptera quadrimaculata var. *plagiograptata*: type not found (probably preserved in Calcutta), I examined specimens from BMNH which MAULIK, the author of original description of the taxon, determined as *plagiograptata*.

DISTRIBUTION

Burma: Tenasserim; China: Yunnan (fig. 694).

Laccoptera (Laccopteroidea) nepalensis BOHEMAN, 1855

(figs 645-656, 665, 666, 673, tab. 16: 1-4)

Cassida quadrimaculata THUNBERG, 1789: 86; SCHÖNHERR, 1817: 221, not *C. quadrimaculata* DE GEER, 1775.

Laccoptera quadrimaculata: BOHEMAN, 1856: 156, 1862: 385; GEMMINGER and HAROLD, 1876: 3662; MAULIK, 1916: 587; 1919: 347 (incl. fig.); SPAETH and REITTER, 1926: 9; SPAETH, 1938: 231; GRESSITT, 1952: 471, 584 (incl. fig., egg, larva, pupa); CHEN and ZIA, 1961: 441; GRESSITT and KIMOTO, 1963: 956 (incl. fig., egg, larva, pupa); KIMOTO, 1966: 643; 1991: 26, 1998: 35 (incl. colour photo); KIMOTO and TAKIZAWA, 1973: 180; TAKIZAWA, 1975: 62; 1978: 602; 1980: 22 (larva); 1985 a: 5; 1985 b: 113; 1987: 527; 1988: 10; 1989: 325; MEDVEDEV and EROSHKINA, 1982: 107; 1988: 123; LIZHONG, 1982: 54; ZAITSEV and MEDVEDEV, 1983: 137 (larva); CHEN and ZIA, 1984: 79; BOROWIEC, 1985: 28; 1990 a: 703; BASU, 1985: 213; CHEN et al., 1986: 575, 635 (incl. fig.); YU, 1986: 681; BASU and HALDER, 1987: 238; BOROWIEC and TAKIZAWA, 1991: 638; ZAJCEV, 1992: 177 (pupa); MEDVEDEV, 1992: 35, 1997: 265; MOHAMEDSAID, 1993: 46 (colour photo), 1994: 370, 2000 a: 359; KIMOTO and CHU, 1996: 134; KIMOTO et al., 1995: 108 (incl. photo); MEDVEDEV and SPRECHER-UEBERSAX, 1999: 350.

Laccoptera (Laccoptera) quadrimaculata: SPAETH, 1914 e: 82.

Laccoptera quadrimaculata quadrimaculata: CHEN et al., 1986: 576, 635, pl. XIII (incl. colour fig.); YU, 1986: 681; LIZHONG, 1989: 87.

Laccoptera 4-maculata: MEDVEDEV and DAN, 1982: 96.

Laccoptera Nepalensis BOHEMAN, 1855: 76, 1856: 156, 1862: 385; GEMMINGER and HAROLD, 1876: 3662; BOROWIEC, 1996: 35; MOHAMEDSAID, 2000 b: 377.

Laccoptera (Laccoptera) nepalensis: SPAETH, 1914 c: 82.

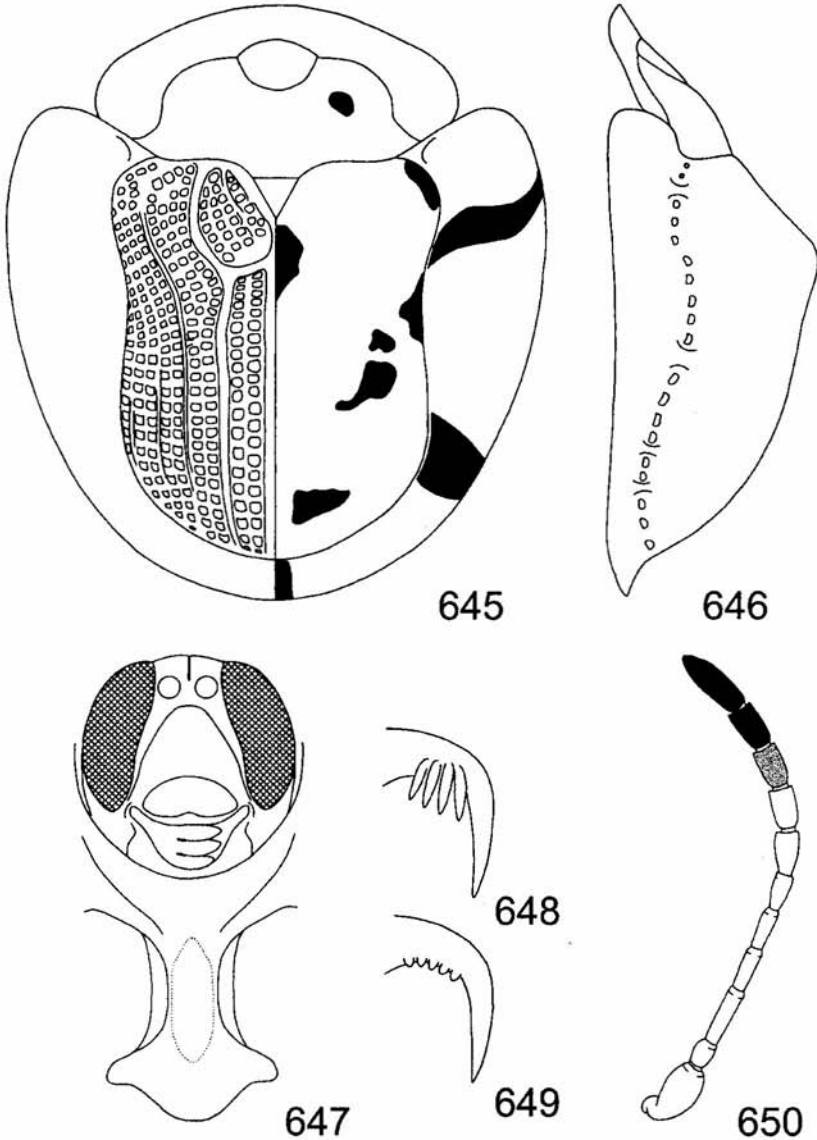
Laccoptera quadrimaculata nepalensis: YU, 1983: 795, 1986: 681, 1988: 356; CHEN et al., 1986: 576, 635.

Laccoptera (Laccopteroidea) nepalensis: BOROWIEC, 1999: 219.

Laccoptera Bohemani WEISE, 1910 d: 42 (= *Laccoptera chinensis* sensu BOHEMAN, 1855); SPAETH, 1913: 46, 1914 a: 15.

Laccoptera quadrimaculata ssp. *Bohemani*: SPAETH, 1914 c: 82.

Laccoptera quadrimaculata ab. *bohemani*: CHŪJŌ, 1934: 153.

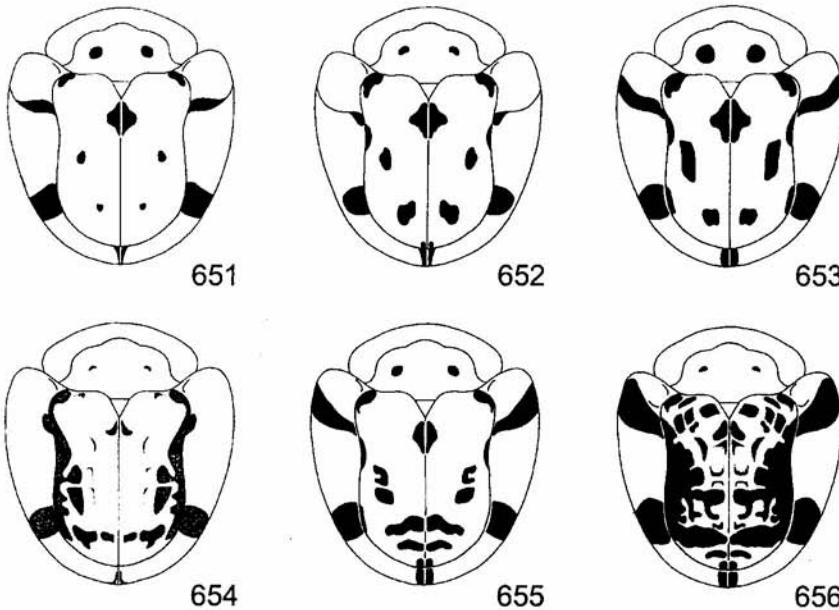


645-650. *Laccoptera nepalensis*: 645 - body in dorsal view, 646 - body in lateral view, 647 - head and prosternum, 648 - inner side of claw, 649 - outer side of claw, 650 - antenna

- Lacoptera quadrimaculata bohemani*: GRESSITT, 1938 a: 191; 1938 b: 384; 1938 c: 581; 1939: 140.
Lacoptera Thunbergi SPAETH, 1914 a: 15 (new name for *Cassida quadrimaculata* THUNBERG, 1789 not DE GEER, 1775).
Lacoptera chinensis F.: BOHEMAN, 1855: 71, 1856: 155, 1862: 384; GEMMINGER and HAROLD, 1876: 3662 (misinterpretation).

DIAGNOSIS

L. nepalensis and *L. fruhstorferi* form group of species with the most triangular body, a sutural spot on explanate margin of elytral disc, and humeral spots always separated from anterior border of explanate margin. In *L. nepalensis* the ground colour of elytron is darker (yellow to yellowish-brown) than in *L. fruhstorferi* (straw yellow). In *L. nepalensis* humeral spots on explanate margin of elytra are arranged only slightly oblique and never extend to humeral angles, while they do in *L. fruhstorferi* and their arrangement is more oblique. Abdomen in *L. nepalensis* is usually yellow or only with infuscate basal margins of sternites, and almost completely black in *L. fruhstorferi*. Intervals of *L. nepalensis* are convex, interval 3 usually forms elongate costa, and interval 5 at least in the middle is more convex than neighbouring intervals, while in *L. fruhstorferi* intervals are mostly uniformly slightly convex, and only interval 3 is slightly more convex than others. The special problem is distinguishing of *L. nepalensis* from *L. tredecimpunctata* because specimens of both species usually have very similar colouration in the area of sympatry (Muellerian mimicry?); However, a sutural spot on marginalia in all populations of *L. nepalensis* (sometimes reduced only to a narrow stripe along sutural margin of elytra) always occur, while no sutural spot is ever present in *L. tredecimpunctata*.

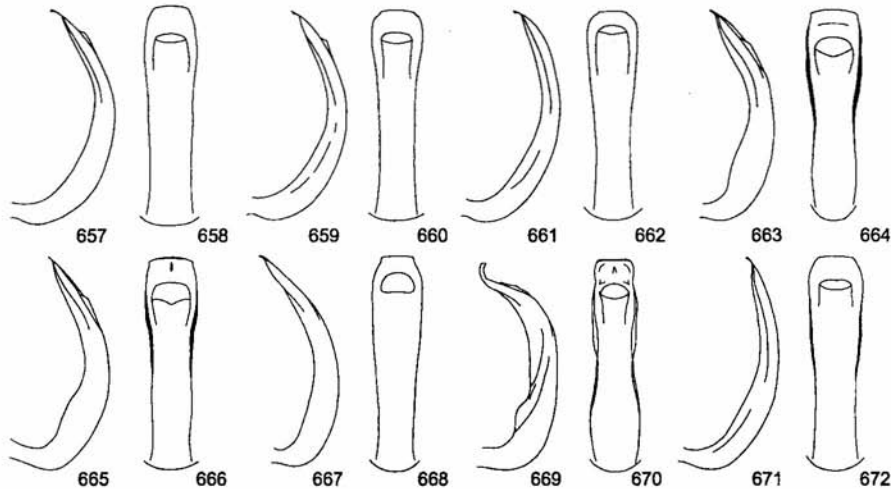


651-656. *Lacoptera nepalensis*: variation of dorsal pattern

DESCRIPTION

L = 7.2-9.2; W = 5.9-8.0; Lp = 2.3-3.0; Wp = 4.0-5.1; L/W = 1.12-1.26; Wp/Lp = 1.59-1.88. Body almost triangular (fig. 645). Antennae dimorphic, especially the last segment id distinctly longer in male than in female.

Extremely variable species. Pronotum yellowish-brown or brown, usually with two small black spots, sometimes reduced to two black points in the middle (figs 651-656), exceptionally spots completely obsolete. Scutellum yellowish-brown or brown. Ground colour of elytral disc yellowish-brown or brown. In pale forms, common in south-eastern range, disc with a spot in the postscutellar area, a spot at 4/5 length of interval 3, a spot on humeral callus, a spot at half length between interval 5 and 6, and two spots along the margin of disc, first slightly below the humeral spots of marginalia, second close to the posterolateral spots of marginalia (fig. 653). The palest form have no spots along the margin of disc (figs 651, 652). In dark forms spots may expand and partly coalesce (fig. 655), and sometimes form dark bands along sides of disc (fig. 654). In the darkest form, the elytral disc is mostly dark brown with paler, yellow-brown reticulation (nominotypical form, fig. 656) – such forms predominate in Nepal, Yunnan and Burma. Explanate margin with brown humeral, posterolateral, and always with sutural spots (figs 651-656). Humeral spots usually starting below humeral callus and never extend to the anterior margin of marginalia. In the palest form the humeral spot is reduced to a small spot below humeral callus (figs 652, 654). In the darkest form the upper margin of humeral spot never extends to humeral angle. Ventrites mostly yellow, usually with black metathorax and brown basal margins

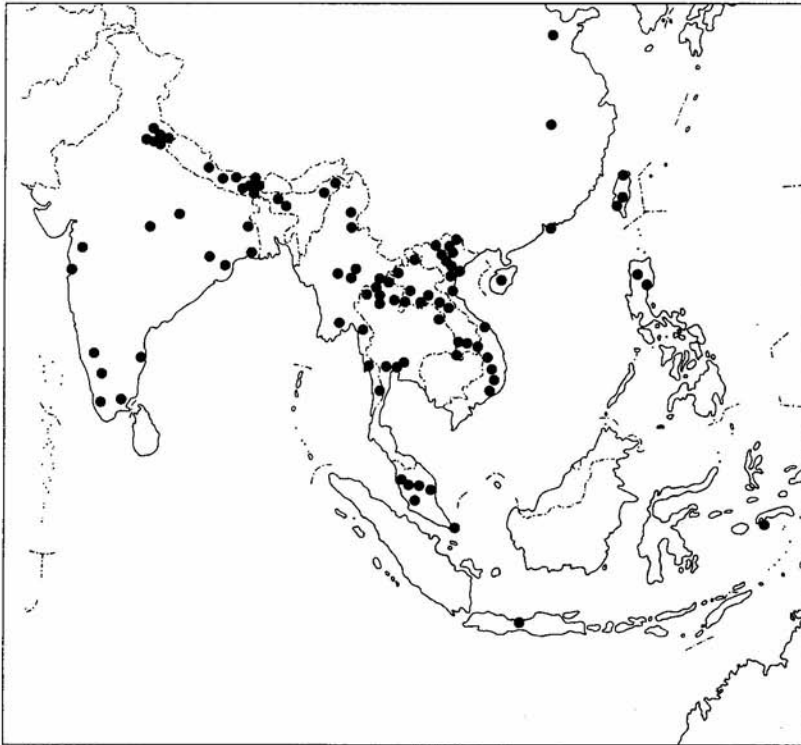


657-672. Aedeagi: 657, 658 - *Laccoptera fallax*, typical form; 659, 660 - *L. fallax*, form from Timor island; 661, 662 - *L. permodica*; 663, 664 - *L. prominens*; 665, 666 - *L. nepalensis*; 667, 668 - *L. fruhstorferi*; 669, 670 - *L. quatuordecimnotata*; 671, 672 - *L. sculpturata*; 657, 659, 661, 663, 665, 667, 669, 671 - lateral; 658, 660, 662, 664, 666, 668, 670, 672 - dorsal

of abdominal sternites, only occasionally the ventrites are yellow with the middle part of metathorax only slightly infuscate. Legs yellow. Antennae yellow, usually three or four last segments infuscate or black, but in some populations from India only two segments or only the top of the last segment infuscate.

Pronotum elliptical, 1.59-1.88 times wider than long, with maximum width at 2/5 basal length, sides rounded. Disc moderately convex. Surface of pronotum with irregular folds and wrinkles, only occasionally the sculpture tends to form more regular longitudinal striation. Surface of explanate margin usually slightly irregular.

Elytral base distinctly wider than base of pronotum. Humeral angles almost rightangled, protrude anterad. Disc slightly irregularly convex, with very low and obtuse postscutellar tubercle and distinct postscutellar impressions (fig. 646). Surface of elytra strongly sculptured, explanate margin punctate. Punctuation of disc coarse and regular, intervals in anterior part of disc usually with numerous, additional punctures. Spaces between punctures elevated. Intervals slightly elevated, interval 3 along the whole length and interval 5 in the middle higher than others, form obtuse costae. Apex of elytral epipleura bare.



673. Distribution of *Laccoptera nepalensis*

Clypeus 1.5 times wider than long, convex, strongly elevated at the top. Labrum broad, emarginate to 1/4 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, with a distinct impression in the middle (fig. 647).

Length ratio of male antennal segments: 100: 43: 89: 68: 64: 57: 64: 61: 61: 64: 114, segment 3 approximately 2.1 times longer than segment 2 and approximately 1.3 times than segment 4 (fig. 650).

Inner pecten of claw usually with four teeth extending to 2/5 length of claw (fig. 648), outer pecten with five very short teeth only slightly extending beyond the margin of claw (fig. 649).

Aedeagus moderately broad, distinctly narrowed basally. Apex truncate, without apical process. Apical part distinctly curved ventrad. Ventral side without membrane (figs 665, 666).

HOST PLANTS

Convolvulaceae: *Calystegia soldanella* (CHŪJŌ and KIMOTO 1961); *Ipomoea indica* (TAKIZAWA 1975); *Ipomoea* sp. (TAKIZAWA 1978 b, MEDVEDEV et DAN 1982).

TYPE MATERIAL

Cassida quadrimaculata: type lost.

Laccoptera nepalensis: lectotype: "Nepal" "Westerm." "Type" (NRS) – present designation; paralectotype: "HOPE" "Nepal" "Nepalensis Bhn." "coll. Mannh." (HU).

Laccoptera bohemani: type not found. Probably some specimens named *L. bohemani* in WEISE's collection in ZMHU are syntypes, but they were mixed with other, more recently collected but similarly labelled specimens.

DISTRIBUTION

Andamanes; Burma; S China; India; Indonesia: Java, Sumatra; Japon: Ryukyu; Laos; Malaysia; Nepal; Singapore; Thailand; Vietnam. Very common in continental Asia, very rare, probably introduced, on Java and Sumatra (fig. 673).

REMARKS

In most papers *L. nepalensis* is referred to as *L. quadrimaculata* although this name is a junior homonym. SPAETH (1914 a) proposed a new name *Laccoptera thunbergi* for *Cassida quadrimaculata* THUNBERG, 1789 not DE GEER, 1775 but he did not know that *Laccoptera nepalensis* BOHEMAN, 1855 was available as an older name. SPAETH listed *L. nepalensis* in his catalogue (1914 e) as different species. Chinese authors (YU 1983, CHEN et al. 1986) first treated *L. nepalensis* as a subspecies of *L. quadrimaculata*, although that the latter name is a junior homonym. I examined type of *L. nepalensis* and realized that it is conspecific with the species frequently listed as *L. quadrimaculata*. The "*nepalensis*" form is treated here only as a local, mountainous dark aberration of the widespread and variable species. Thus, *Laccoptera nepalensis* is the oldest available name and should be used for all populations known hitherto under name *L. quadrimaculata*. This view was accepted in BOROWIEC's catalogue (1999). An additional, nomenclatoric confusion was caused by WEISE (1910 b), who

proposed a new name *Laccoptera bohemani* for *Laccoptera chinensis* (F.) sensu BOHEMAN, 1855 not FABRICIUS, 1798 (the species described by FABRICIUS in the genus *Cassida* has been recently classified within *Basiprionota*), which is the same taxon as *L. quadrimaculata*. Thus, the name *Laccoptera bohemani* also is a junior synonym of *L. nepalensis*.

***Laccoptera (Laccopteroidea) permodica* (BOHEMAN, 1862)**

(figs 661, 662, 674-680, tab. 17: 8, 9)

Cassida permodica BOHEMAN, 1862: 349; GEMMINGER and HAROLD, 1876: 3657; MASTERS, 1889: 998; SPAETH, 1903 a: 136.

Cassida (Cassida) permodica: SPAETH, 1914 e: 115.

Laccoptera permodica: BOROWIEC, 1990 b: 36, 1987 b: 414.

Laccoptera (Laccopteroidea) permodica: BOROWIEC, 1999: 219.

Laccoptera insulana WEISE, 1910 a: 145; BOROWIEC, 1987 b: 414, 1990 b: 36 (as syn.).

Laccoptera (Laccoptera) insulana: SPAETH, 1914 e: 82.

DIAGNOSIS

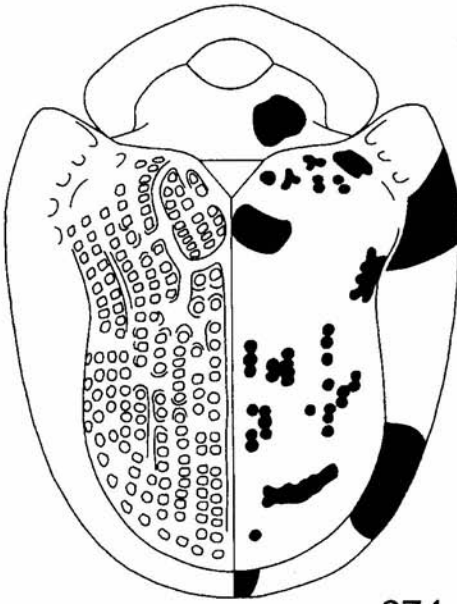
L. permodica belongs to the group of species from the eastern part of Sunda Is. with oval or slightly trapezoidal body and a sutural spot on the explanate margin of elytra. The group also includes *L. fallax* and *L. sutteri*. *L. permodica* differs from either in slimmer and more oval body (L/W 1.20-1.29, while in both relatives below 1.20), slightly depressed elytral disc, and extremely short inner pectens of claws, which extend only slightly beyond border of claw. *L. sutteri* has a wider explanate margin of elytra, sharper humeral angles, and posterior part of elytral disc with only one spot (*L. permodica* has two or three spots). At first glance very slim specimens of *L. fallax* are very similar to *L. permodica*, but differ in longer inner pectens of claws, extending to 1/4 length of the front claw. Spots of elytral disc in *L. permodica* are usually smaller but more numerous than in *L. fallax*.

DESCRIPTION

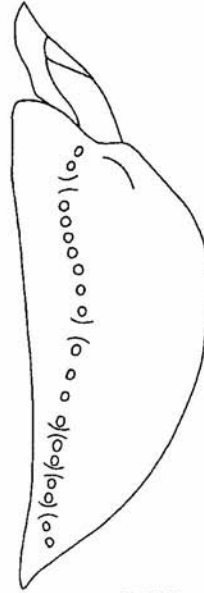
L = 7.8-9.3; W = 6.5-7.4; Lp = 2.3-2.5; Wp = 4.3-4.6; L/W = 1.20-1.29; Wp/Lp = 1.87-2.08. Body broadoval (fig. 674). Antennae dimorphic, especially last segment distinctly longer in male than in female.

Pronotum yellow or yellowish-brown, with two large black spots in the middle. Scutellum yellowish-brown or brown. Elytral disc yellowish-brown or brown with a black spot in the postscutellar area, a spot on humeral callus, a spot on the sides of disc behind humeral callus, and numerous small spots spread irregularly on the whole disc surface. These small spots are often reduced to a narrow areola of elytral punctures, or expanded and partly coalesced into an irregular dark reticulation. Explanate margin with humeral, posterolateral, and sutural spots. Humeral spots separated from the basal margin of elytra (fig. 674). Ventrites yellow or yellowish-brown with two, black spots on metathorax. Legs yellow. Antennae yellow, five or sometimes four last segments black.

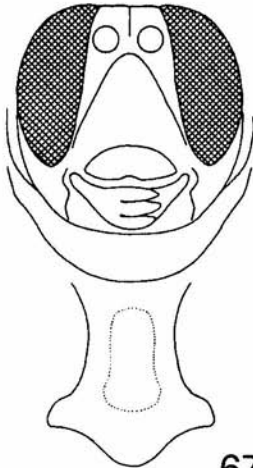
Pronotum elliptical, 1.87-2.08 times wider than long, with maximum width at half length, sides rounded. Disc moderately convex. Surface of disc indistinctly folded, sometimes almost smooth or only roughly punctate, especially on black spots. Surface of explanate margin distinctly irregular.



674



675



676



677



678



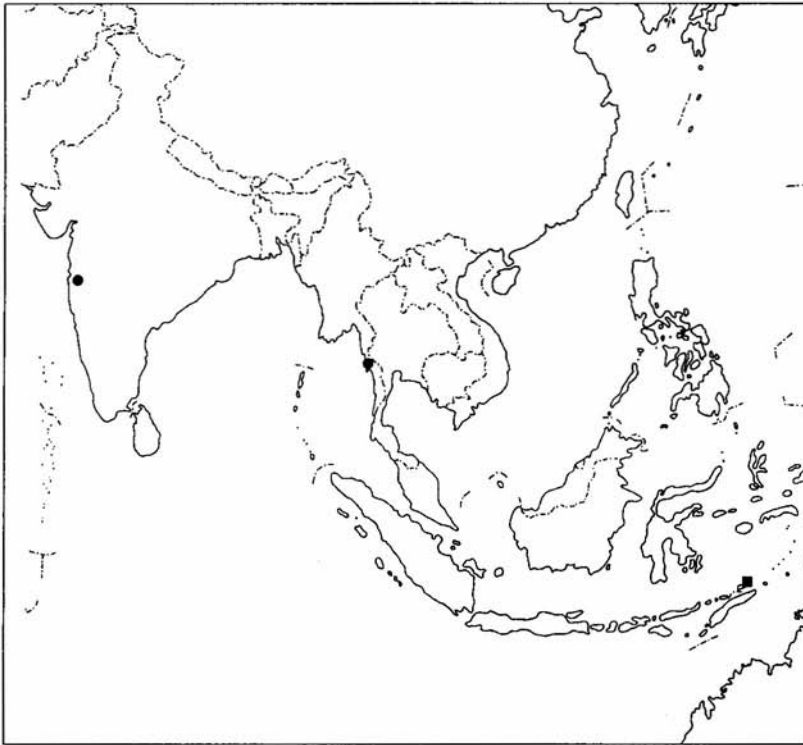
679

674-679. *Laccoptera permodica*: 674 - body in dorsal view, 675 - body in lateral view, 676 - head and prosternum, 677 - inner side of claw, 678 - outer side of claw, 679 - antenna

Elytral base distinctly wider than base of pronotum. Humeral angles angulate, protrude anterad. Disc regularly convex, indistinctly elevated in the postscutellar area, often slightly depressed in the posterior part, without tubercles (fig. 675), but with distinct postscutellar impressions. Surface of elytra distinctly sculptured. Punctuation coarse and regular, spaces between punctures elevated. Intervals narrow, narrower than rows on the sides of disc, almost as wide as rows in the sutural half of disc, slightly elevated; especially interval 3 forms an obtuse costa, and interval 5 on the top of disc is more elevated than neighbouring intervals. Marginalia coarsely but shallowly punctate. Apex of elytral epipleura with sparse hairs.

Clypeus 1.2 times wider than long, with a distinct elevation at the top. Labrum broad, emarginate to 1/5 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, with distinct impression in the middle (fig. 676).

Length ratio of antennal segments: 100: 36: 70: 66: 60: 60: 53: 56: 56: 56: 113, segment 3 approximately 1.8 times longer than segment 2 and approximately 1.1 times than segment 4 (fig. 679).



680. Distribution of *Laccoptera permodica* (black squares) and *Laccoptera foveolata* (black circles)

Claws with short inner pecten, with four teeth only slightly extending beyond the margin of claw (fig. 677), outer pecten reduced to two very small tubercles (fig. 678).

Aedeagus slim, distinctly narrowed basally. Apex truncate, without apical process. Apical part gently curved ventrad. Ventral side without membrane (figs 661, 662).

TYPE MATERIAL

Cassida permodica: holotype: “[illegible: Copida or Cupid]” “Type” (BMNH).

Laccoptera insulana: lectotype: “Wetter Is., IV.1901” (ZMHU) – designated by BOROWIEC (1987b). In the collection of ZMHU there are 38 specimens with labels similar to that of the lectotype; probably part of them belong to the type series.

DISTRIBUTION

Indonesia: Timor, Wetter Is. BOHEMAN’s (1862) record from New Guinea is probably based on a misinterpretation of the type locality (fig. 680).

Laccoptera (Laccopteroidea) prominens CHEN et ZIA, 1964

(figs 663, 664, 681-686, 694, tab. 16: 5)

Laccoptera prominens CHEN et ZIA, 1964: 131, 138; CHEN et al., 1986: 574, 635 (incl. fig.).

Laccoptera (Laccopteroidea) prominens: BOROWIEC, 1999: 219.

DIAGNOSIS

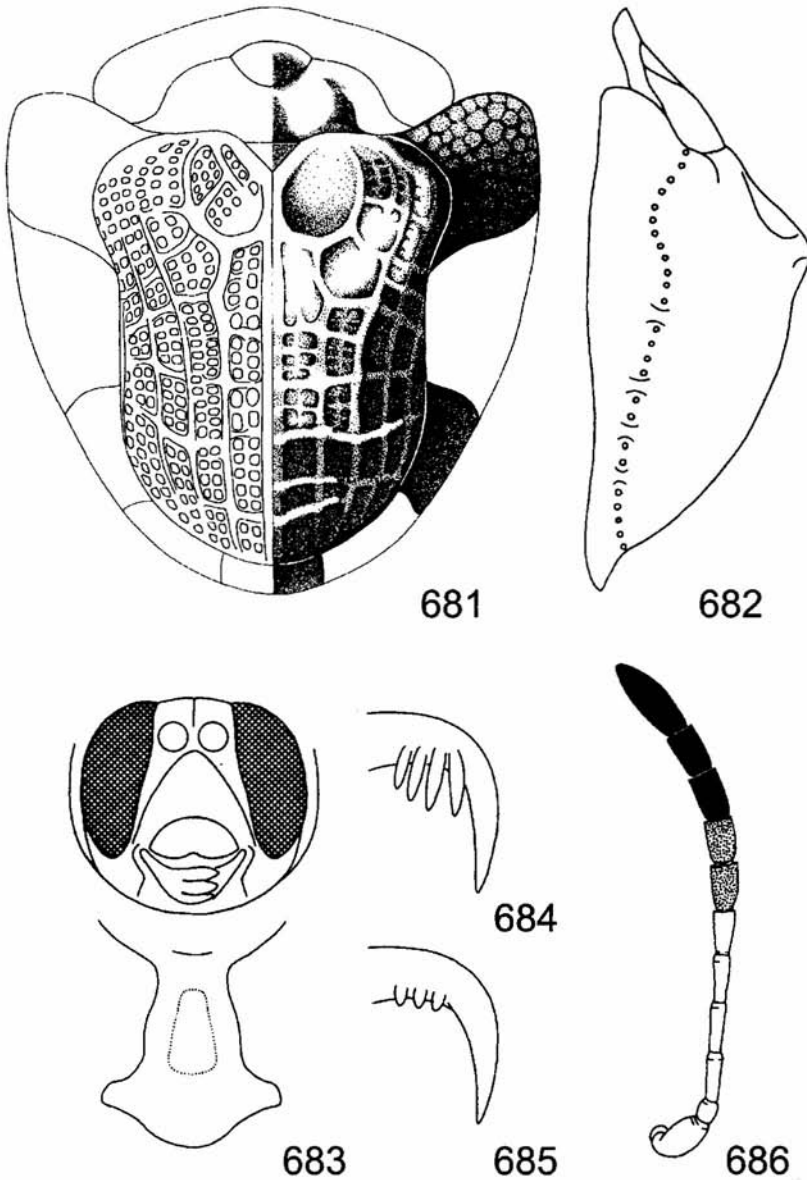
Only *L. prominens*, *L. schultzei*, and *L. cheni* have broad humeral spots on explanate margin of elytra, which extend to anterior margin of marginalia. *L. cheni* differs in elytral marginalia without sutural spot. *L. prominens* is smaller than *L. schultzei*, less than 8.5 mm (*L. schultzei* above 9 mm), and has postscutellar elevation less prominent. The two species are allopatric: *L. prominens* is known only from Yunnan and Guizhou provinces in S China and *L. schultzei* only from Mindoro Island of the Philippines.

DESCRIPTION

$L = 7.4-8.3$; $W = 6.4-7.0$; $Lp = 2.0-2.2$; $Wp = 4.2-4.5$; $L/W = 1.13-1.18$; $Wp/Lp = 2.04-2.10$. Body triangular (fig. 681). Antennae dimorphic, especially last segment distinctly longer in male than in female.

Pronotum yellowish-brown or brown, often darker at basal margin, without spots or with two small, indistinct brown spots. Scutellum yellow, yellowish-brown or dark brown. Elytral disc darker than pronotum, usually top of disc paler, yellowish brown, sides darker, dark brown to almost black. Elytra bear no pattern, but the crossing borders of elytral folds usually are paler. Explanate margin with dark brown to almost black, very broad humeral, posterolateral, and sutural spots (fig. 681). Humeral spots usually become gradually darker from anterior to posterior margin, and always extend to the anterior margin of marginalia. Ventrites yellowish-brown with a brown or black base of prosternal process, black metathorax

except lateral plates, and brown to black central part of abdomen. Legs yellowish-brown. Antennae yellowish-brown, became gradually darker apically, last three segments usually completely black.



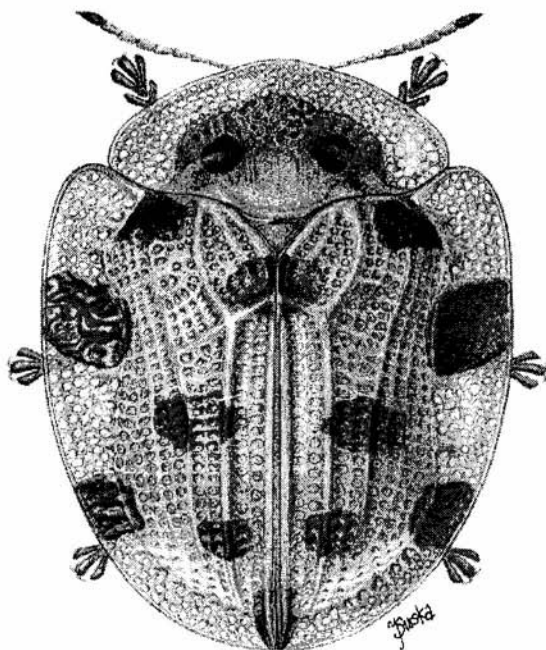
681-686. *Laccoptera prominens*: 681 - body in dorsal view, 682 - body in lateral view, 683 - head and prosternum, 684 - inner side of claw, 685 - outer side of claw, 686 - antenna

Pronotum elliptical, 2.04-2.10 times wider than long, with maximum width at 1/3 basal length, sides rounded. Disc moderately convex. The whole surface of pronotum with irregular wrinkles and folds.

Elytral base distinctly wider than base of pronotum. Humeral angles protrude anterad and from acute to right. Disc convex, with postscutellar tubercle of blunt top (fig. 682), distinct postscutellar impressions, and less distinct principal impressions. Surface of elytra strongly sculptured. Puncturation coarse and very dense, punctures nearly touch each other. Spaces between punctures elevated, form numerous, transverse wrinkles. Intervals on the sides linear and barely marked, in the sutural half of disc only intervals 1, 3, and 5 well marked, but narrower than rows, slightly elevated. Apex of elytral epipleura with sparse hairs.

Clypeus 1.5 times wider than long, convex, with a distinct elevation at the top, often divided into two small tubercles. Labrum broad, emarginate to 1/6-1/5 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, with a distinct impression in the middle (fig. 683).

Length ratio of antennal segments: 100: 37: 87: 91: 87: 79: 83: 79: 87: 87: 166, segment 3 approximately 2.4 times longer than segment 2 and slightly shorter than segment 4 (fig. 686).



687. *Laccoptera quatuordecimnotata*, habitus

Claws with distinct inner pecten and four teeth extending to 2/5 length of claw (fig. 684), outer pecten with three short teeth extending slightly beyond the margin of claw (fig. 685).

Aedeagus moderately broad, slightly widened at 2/3 apical length, its sides carinate. Apex truncate, without apical process. Apical part distinctly curved ventrad. Ventral side without membrane (figs 663, 664).

TYPE MATERIAL

Holotype: “[label in Chinese]” (ASB).

DISTRIBUTION

China: Guizhou, Yunnan (fig. 694).

Laccoptera (Laccopteroidea) quatuordecimnotata BOHEMAN, 1855

(figs 669, 670, 687-694, tab. 1: 3, 15: 4)

Laccoptera quatuordecimnotata BOHEMAN, 1855: 64; 1856: 155; 1862: 384; GEMMINGER and HAROLD, 1876: 3662; WEISE, 1897: 104 (*14-notata*); MAULIK, 1919: 352; GRESSITT, 1939: 140; GRESSITT and KIMOTO, 1963: 957; TAKIZAWA, 1980: 21 (larva); 1985 a: 6 (incl. photo); BOROWIEC, 1990 a: 704, 1996: 36; BOROWIEC and TAKIZAWA, 1991: 638.

Laccoptera (Laccoptera) quatuordecim-notata: SPAETH, 1914 c: 83.

Laccoptera quatuordecimpunctata [sic]: MEDVEDEV, 1957: 554.

Laccoptera (Laccopteroidea) quatuordecimnotata: BOROWIEC, 1999: 219.

DIAGNOSIS

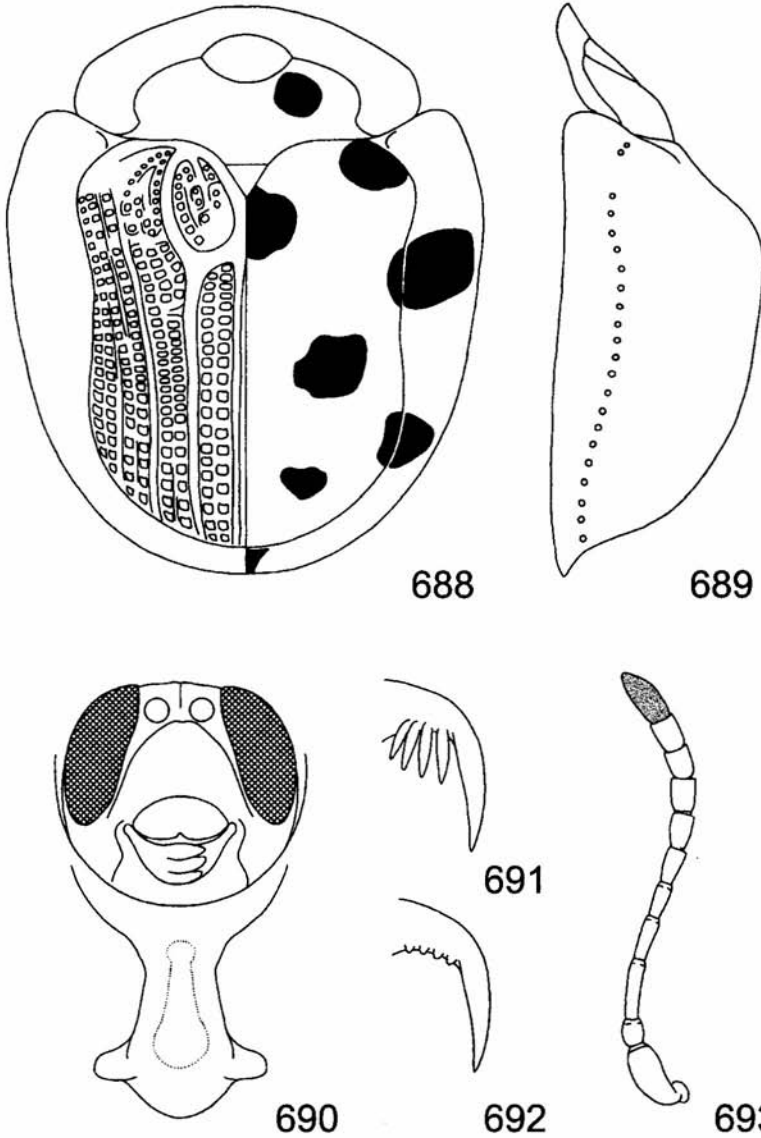
A very distinct species, well distinguished by its large size, with length above 9.7 mm (in other species usually below 9.4 mm), and modified aedeagus with apex S-shaped in lateral view (which does not occur in any species of the subgenus *Laccopteroidea*). Elytral disc with constant pattern, of twenty spots on red background (other species usually show more or less variable pattern and background of elytra is only occasionally red).

DESCRIPTION

L = 9.8-11.4; W = 7.6-8.8; Lp = 2.9-3.6; Wp = 5.6-6.5; L/W = 1.24-1.29; Wp/Lp = 1.61-2.20. Body subtrapezoidal to slightly triangular (figs 687, 688). Antennae dimorphic, especially last segment distinctly longer in male than in female.

Pronotum reddish to reddish-brown, in the middle with two large, round, black spots. Scutellum reddish to reddish-brown. Elytral disc reddish to reddish-brown with a black pattern composed of a spot in the postscutellar area, a spot on humeral callus, a large spot in the middle of disc slightly behind its half length, a smaller spot on the slope, and two spots at the margin of disc, close to the spots of elytral marginalia (fig. 687, 688). Explanate margin with black humeral, posterolateral, and sutural spots. Humeral spots far from the anterior margin of marginalia. Spots on the explanate margin usually extend from the border of disc

to the extreme margin of explanate margin, but sometimes are shorter, and do not extend to the extreme margin; sutural spot usually slightly extends beyond border of disc and the apex of suture of disc black. Ventrites yellow with a black spot on metathorax, the spot sometimes divided into two transverse bands. Lateral plates of metathorax yellow. Legs yellow. Antennae yellow, last segment infuscate or black, sometimes also segment 10 infuscate or black.

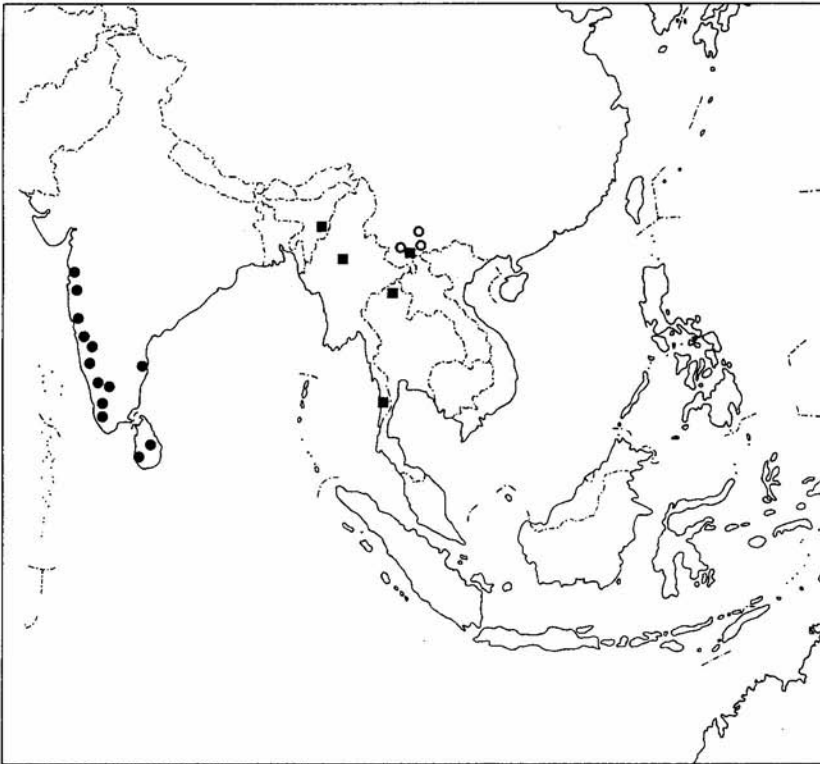


688-693. *Laccoptera quatuordecimnotata*: 688 - body in dorsal view, 689 - body in lateral view, 690 - head and prothorax, 691 - inner side of claw, 692 - outer side of claw, 693 - antenna

Pronotum elliptical, 1.61-2.20 times wider than long, with maximum width at 2/5 basal length, its sides rounded. Disc moderately convex. Surface of disc usually dullish, at the base with indistinct, irregular longitudinal wrinkles, sometimes the whole disc smooth. Marginalia smooth or only slightly irregular, from dullish to slightly shine.

Elytral base wider than the base of pronotum. Humeral angles rounded, protrude anterad. Disc convex, only slightly elevated in the postscutellar area (fig. 689), with distinct postscutellar impressions bordered by a fold. Surface of elytra strongly sculptured. Punctuation coarse and regular only in the area close to suture, on the sides of disc entirely irregular. Intervals marked only in the sutural half of disc, interval 3 along the whole length, interval 5 is distinctly elevated in the middle, intervals 2 and 4 are only slightly elevated and narrower than rows. Apex of elytral epipleura bare.

Clypeus is elevated, 1.6 times wider than long, and with two distinct tubercles at the top. Labrum broad, emarginate to 1/7-1/6 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, with a distinct elongate impression in the middle (fig. 690).



694. Distribution of *Laccoptera quatuordecimnotata* (black squares), *L. fruhstorferi* (black circles) and *L. prominens* (white circles)

Length ratio of antennal segments: 100: 36: 90: 66: 53: 50: 50: 46: 43: 50: 90, segment 3 approximately 2.5 times longer than segment 2 and approximately 1.4 times than segment 4 (fig. 693).

Claws with distinct inner pecten and four teeth extending to 2/5 length of claw (fig. 691), outer pecten with three to four very short teeth, only slightly extending beyond the margin of claw (fig. 692).

Aedeagus distinct, moderately broad, slightly constricted in the middle and below top. Apex truncate, without apical process. Apical part distinctly curved ventrad, apex in lateral view S-shaped. Ventral side without membrane (figs 669, 670).

HOST PLANT

Convolvulaceae: Ipomoea sp. (TAKIZAWA 1980, 1985 a).

TYPE MATERIAL

Holotype: "Ind or" "M. Gall." "Type" (NRS).

DISTRIBUTION

Ceylon; S and W India (fig. 694).

***Laccoptera (Laccopteroidea) schultzei* SPAETH, 1933**

(figs 695-700)

Laccoptera schultzei SPAETH, 1933: 496.

Laccoptera (Laccopteroidea) schultzei: BOROWIEC, 1999: 220.

DIAGNOSIS

Only *L. schultzei*, *L. prominens*, and *L. cheni* have broad humeral spots on explanate margin of elytra extend to the anterior border of explanate margin. *L. cheni* differs in elytral marginalia without sutural spot. *L. schultzei* is well distinguished by its large size, with body length above 9 mm (below 8.5 mm in *L. prominens*), and by the most prominent postscutellar tubercle within the subgenus *Laccopteroidea*. Known only from Mindoro Island of the Philippines (*L. prominens* is known only from Yunnan and Guizhou provinces in S China).

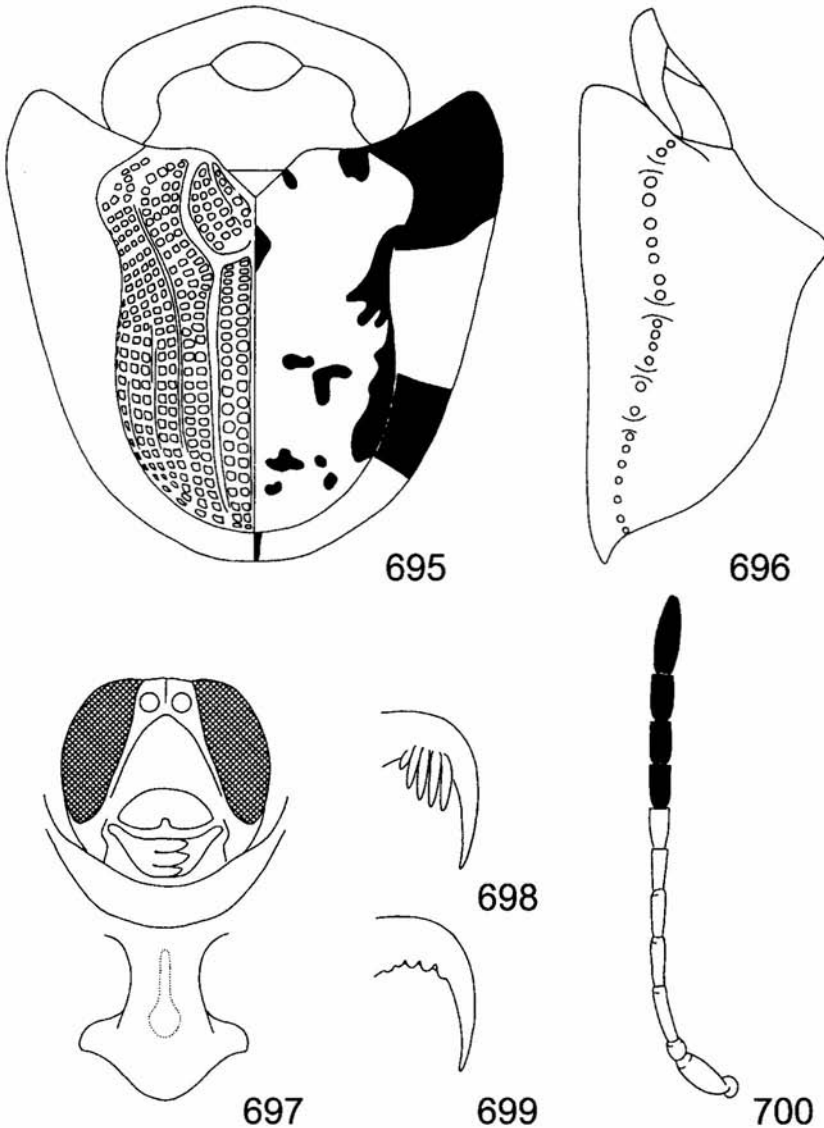
DESCRIPTION

L = 9.3; W = 8.3; Lp = 3.0; Wp = 5.2; L/W = 1.12; Wp/Lp = 1.73. Body triangular (fig. 695). Sexual dimorphism unknown, the only known specimen is male.

Pronotum yellow, without spots. Scutellum yellow. Elytral disc mostly yellow with a reddish-brown pattern including a rhomboidal spot in the postscutellar area, a small spot in the upper corner of scutellum, a spot in the anterior part of humeral callus, an elongate spot along the sides of disc extending from the end of humeral spots to the end of posterolateral spots, and six small spots in the

posterior half of disc. Explanate margin with broad, reddish-brown humeral and posterolateral spots, and narrow sutural spot. Humeral spots extend to the anterior border of explanate margin (fig. 695). Ventrites yellow, only metathorax with a transverse, black spot. Legs yellow. Antennae yellow, last four segments black.

Pronotum elliptical, 1.73 times wider than long, with maximum width at 1/3 basal length, sides rounded. Disc moderately convex. Surface of the whole



695-700. *Laccoptera schultzei*: 695 - body in dorsal view, 696 - body in lateral view, 697 - head and prosternum, 698 - inner side of claw, 699 - outer side of claw, 700 - antenna

pronotal disc with longitudinal wrinkles, which vanish in area above the head. Surface of marginalia slightly irregular, especially on the sides of pronotum.

Elytral base distinctly wider than the base of pronotum. Humeral angles angulate, protrude anterad. Disc strongly convex, with distinct, conical postscutellar tubercle of obtuse top (fig. 696), and distinct postscutellar impressions. Surface of elytra strongly sculptured. Puncturation coarse and regular, spaces between punctures elevated. Intervals mostly narrower than rows, on the sides of disc intervals reduced to narrow lines, only interval 3 as wide as neighbouring rows and slightly elevated, forms blunt costa. Apex of elytral epipleura with sparse hairs.

Clypeus 1.4 times wider than long, with a distinct elevation at the top, and without impressions. Labrum broad, emarginate to 1/4 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, with a very deep impression in the middle (fig. 697).

Length ratio of antennal segments: 100: 33: 106: 93: 90: 80: 77: 80: 80: 83: 150, segment 3 approximately 3.2 times longer than segment 2 and only slightly longer than segment 4 (fig. 700).

Claws with distinct inner pecten, with five teeth extending to half length of claw, last two teeth shortest (fig. 698), outer pecten with three to four very short teeth, extend only slightly beyond the margin of claw (fig. 699).

Aedeagus not examined.

TYPE MATERIAL

Holotype: "Philippines, Mindoro, Abra de Ilog" (MTD).

DISTRIBUTION

Philippines: Mindoro. Known only from the holotype.

Laccoptera (Laccopteroidea) sculpturata BOHEMAN, 1855

(figs 671, 672, 701-706, tab. 15: 3)

Laccoptera sculpturata BOHEMAN, 1855: 78; 1856: 156; 1862: 386; GEMMINGER and HAROLD, 1876: 3662.

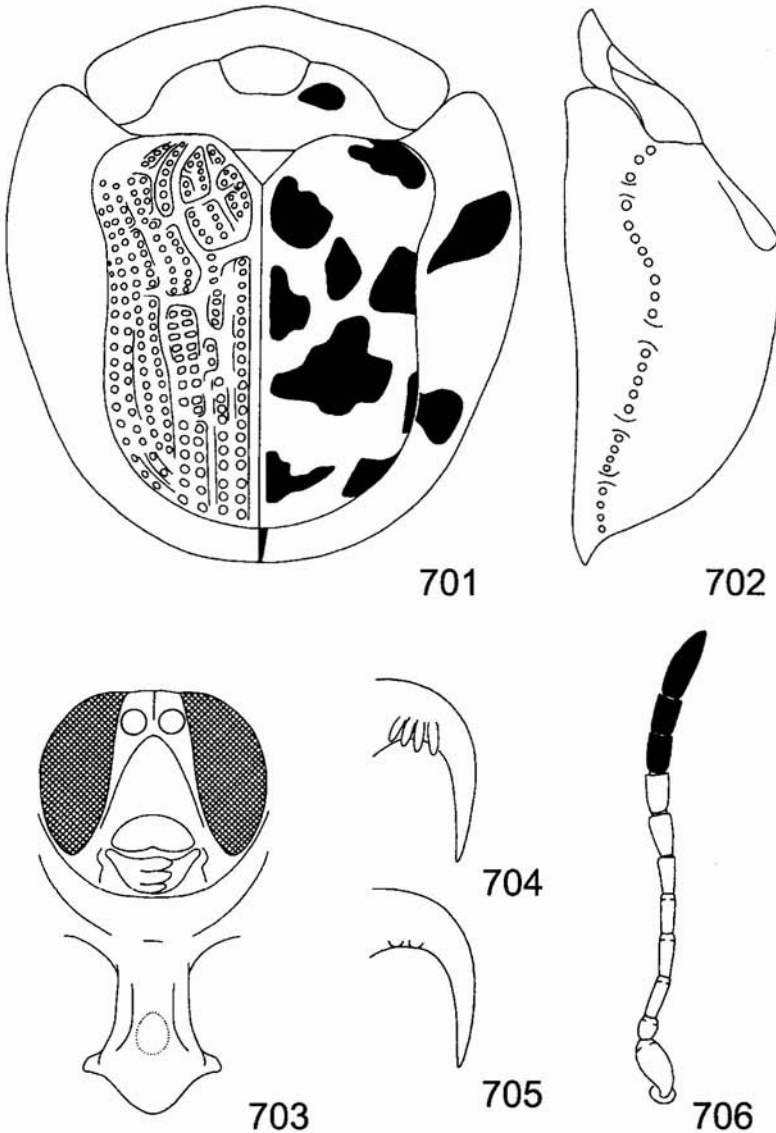
Laccoptera (Laccoptera) sculpturata: SPAETH, 1914 e: 83.

Laccoptera (Laccopteroidea) sculpturata: BOROWIEC, 1999: 220.

DIAGNOSIS

A member of the group of species from Sunda Is., with subtriangular body, sutural spot on explanate margin of elytra, and without band across elytra. The group also comprises *L. sedecimnotata*. In *L. sculpturata* anterior margin of pronotum is less rounded than in *L. sedecimnotata*. Pronotal disc of *L. sculpturata* is practically without sculpture, at most with very fine puncturation, while in *L. sedecimnotata* pronotal disc is usually coarsely punctate and/or slightly wrinkled, rarely only finely punctate. Ground colour of *L. sculpturata* is reddish-brown, darker than in yellowish-brown of *L. sedecimnotata*. In *L. sculpturata* spots on pronotal disc are very small and separated from basal margin of pronotum,

sometimes obsolete, while in *L. sedecimnotata* spots are very large, and usually extend to the base of pronotum. *L. sculpturata* differs from species of *L. fallax* group, in subtriangular body, gently rounded anterior margin of pronotum, and pronotal disc without folds, wrinkles, and striation.



701-706. *Laccoptera sculpturata*: 701 - body in dorsal view, 702 - body in lateral view, 703 - head and prosternum, 704 - inner side of claw, 705 - outer side of claw, 706 - antenna

DESCRIPTION

$L = 7.3-7.4$; $W = 6.4-6.5$; $L_p = 2.1$; $W_p = 4.3-4.5$; $L/W = 1.12-1.15$; $W_p/L_p = 2.14-2.15$. Body subtriangular (fig. 701). Antennae dimorphic, especially last segment distinctly longer in male than in female.

Pronotum brownish-red, in the middle usually with two small, occasionally obsolete, black spots. Scutellum brownish-red. Elytral disc brownish-red with a black pattern composed of a spot on humeral callus, a spot in postscutellar impressions extending to interval 3, a spot behind postscutellar elevation between intervals 1 and 3, a transverse spot, sometimes divided into two spots, at 1/3 length of disc between interval 4 and submarginal row, a transverse spot, sometimes divided into 2-4 spots, behind half length of disc, between intervals 1 and 6, a spot at base of posterolateral spots on explanate margin, and two spots on the slope, which sometimes are connected but never form a distinct transverse band. Explanate margin with narrow humeral, posterolateral, and very narrow sutural spots. Humeral spots far from the anterior margin of marginalia, usually placed in the centre of explanate margin, do not extend to either the border of disc or the lateral margin of elytra, only occasionally humeral spots extend from the border of disc to the lateral margin of elytra. Posterolateral spots usually extend from the border of disc to half width of explanate margin, sometimes reduced to a small spot at the border of disc (fig. 701). Ventrites uniformly yellowish-brown. Legs yellowish-brown. Antennae yellowish-brown, last three or four segments black.

Pronotum elliptical, 2.14-2.15 times wider than long, with maximum width slightly before half length, anterior margin very gently rounded. Disc moderately convex, finely punctured, without striation or wrinkles. Explanate margin smooth. The whole surface of pronotum distinctly dull.

Elytral base wider than base of pronotum. Humeral angles angulate, protrude anterad. Disc convex, only slightly elevated in the postscutellar area (fig. 702), with distinct postscutellar impressions bordered by a low fold, and a distinct postscutellar H-shaped elevation. Puncturation coarse and regular. Surface of elytra finely sculptured. Intervals as wide as or slightly narrower than rows, in the sutural half of disc slightly elevated, especially interval 3, which forms a low costa. Apex of elytral epipleura bare.

Clypeus 1.2 times wider than long, convex, with a sharp tubercle at the top. Labrum broad, emarginate to 1/7 length. Mandibles with distinct teeth. Prosternal process rhomboidal, narrow, with an elongate impression in the middle (fig. 703).

Length ratio of antennal segments: 100: 36: 71: 68: 57: 68: 61: 61: 61: 121, segment 3 approximately 2 times longer than segment 2 and slightly longer than segment 4 (fig. 706).

Claws with inner pecten with four teeth extending to 1/4 length of claw (fig. 704), outer pecten with only two very small teeth which do not extend beyond the margin of claw (fig. 705).

Aedeagus moderately broad, narrowed basally. Apex truncate, without apical process. Apical part very gently curved ventrad. Ventral side without membrane (figs 671, 672).

TYPE MATERIAL

Lectotype: "Celebes" "Westerman" (NRS) – designated by BOROWIEC (1999); paralectotype: "Celebes" "Westerm." "coll. Mannh." "A. sculpturata Bhn." "Deloyala scrobiculata Mannerh." (HU); paralectotype: "Mus. Westerm." "Celebes van Tujling sculpturata Boh. var" (ZMK).

DISTRIBUTION

Indonesia: Sulawesi.

***Laccoptera (Laccopteroidea) sedecimnotata* BOHEMAN, 1862**

(figs 619, 707-712, 732, 733, tab. 15: 5, 6)

Laccoptera sedecimnotata BOHEMAN, 1862: 386; GEMMINGER and HAROLD, 1876: 3662; BOROWIEC, 1990 a: 704, 1996: 37.

Laccoptera (Laccoptera) sedecim-notata: SPAETH, 1914 c: 83.

Laccoptera 16-notata: SPAETH, 1926 c: 119.

Laccoptera sedecim-notata: HINCKS, 1953: 70.

Laccoptera (Laccopteroidea) sedecimnotata: BOROWIEC, 1999: 220.

Laccoptera sedecim-notata ssp. *sumbae* HINCKS, 1953: 70, n. syn.

DIAGNOSIS

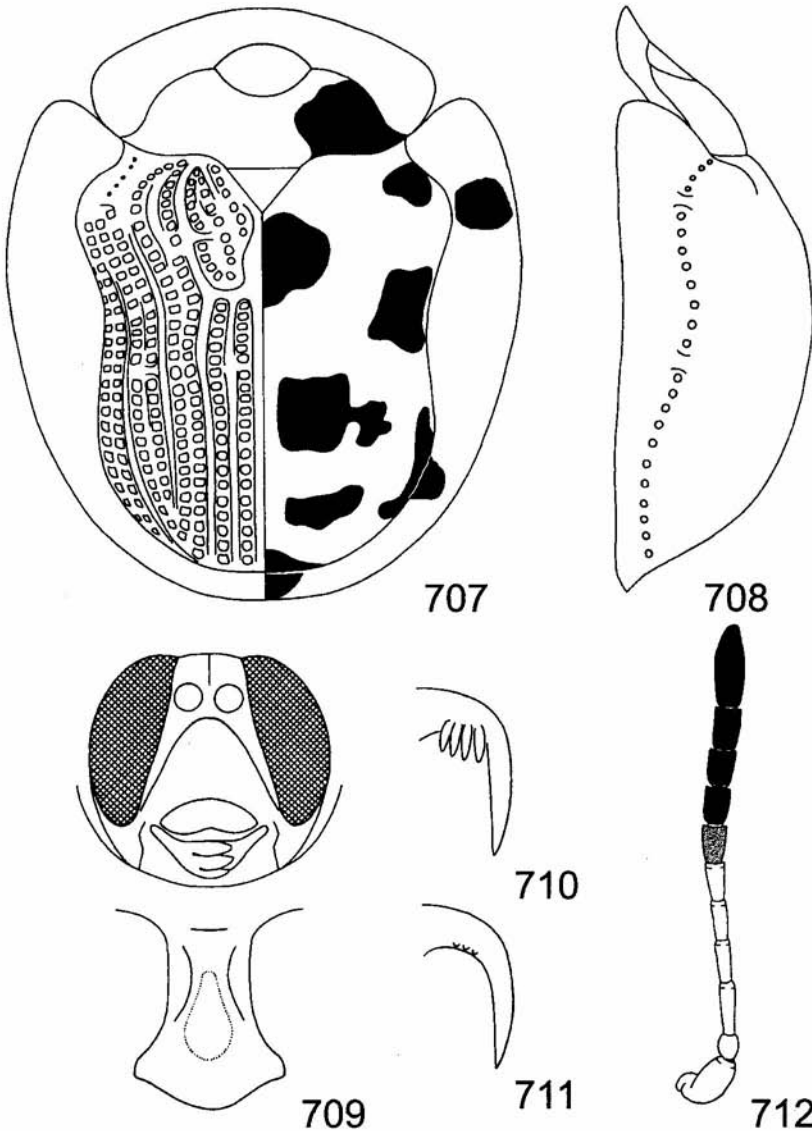
A member of the group of species from Sunda Is., with dark yellow to reddish-yellow or yellowish-brown ground colour, subtriangular body, sutural spot on explanate margin of elytra, and without band across elytral disc. The group also comprises *L. sculpturata*. *L. sedecimnotata* is well distinguished by extremely large spots on pronotal disc, usually extending to base of pronotum or separated from basal margin only by very narrow pale line (pronotal spots are distinctly separated from base of pronotum in other species from Sunda Is.). *L. sculpturata* differs in darker, reddish-brown ground colour, less rounded anterior margin of pronotum, and the lack of special sculpture on pronotal disc, which shows fine puncturation at the most, while in *L. sedecimnotata* pronotal disc usually shows coarse puncturation or slight wrinkles. The two species are allopatric, *L. sculpturata* occurs only on Sulawesi, and *L. sedecimnotata* is widely distributed in southern Sunda Islands from Sumatra to Flores.

DESCRIPTION

L = 7.4-8.4; W = 5.9-6.9; Lp = 1.9-2.4; Wp = 4.1-4.7; L/W = 1.15-1.25; Wp/Lp = 1.91-2.26. Body subtriangular (fig. 707). Antennae dimorphic, especially last segment distinctly longer in male than in female.

Pronotum yellowish-brown or reddish-brown with two, large, black spots which almost always extend to the basal margin of pronotum or remain separated from the pronotal base only by very a narrow yellow line. Scutellum yellowish-brown or brown. Elytral disc yellowish-brown or brown with a black pattern including a spot on humeral callus, a a large spot in the postscutellar area, a spot behind humeral callus, a a large spot (sometimes divided into two smaller

spots) behind middle of disc, a spot on slope, and two spots at the border of disc, one close to the posterolateral spots and another close to the sutural spot of explanate margin. The pattern is rather constant, but spots can vary from small to large, and occasionally some spots are obsolete. Explanate margin yellowish-brown or brown with humeral, posterolateral, and sutural spots. Humeral spots separated from the anterior margin of marginalia, usually forms a round spot in the



707-712. *Laccoptera sedecimnotata*: 707 - body in dorsal view, 708 - body in lateral view, 709 - head and prosternum, 710 - inner side of claw, 711 - outer side of claw, 712 - antenna

centre of margin and do not extend to the lateral margin of marginalia or the border of disc; occasionally the humeral spot is completely reduced or expanded to the whole width of marginalia. Posterolateral spot is usually short and extends only to half width of marginalia, occasionally it is obsolete, but never both humeral and postlateral spots are obsolete. Sutural spot broad, connected with a spot at apex of disc (fig. 707). Ventrites mostly yellow, usually with black meso, metathorax, and central part of abdomen, sometimes only central parts of thorax are brown to black, occasionally only sides of metathorax infuscate. Legs yellow, coxa, trochanters, and basal half of femora from dark brown to black in specimens with mostly black ventrites. Antennae yellow, usually last five segments infuscate to black.

Pronotum ellyptical, 1.91-2.26 times wider than long, with maximum width at half length. Disc moderately convex, finely punctured, usually without or with only indistinct wrinkles, occasionally the whole surface of disc is slightly irregular or plicate. Explanate margin smooth. In specimens with well marked sculpture the whole surface of pronotum is distinctly dull, in specimens without sculpture, at least the lateral parts of pronotum are shiny.

Elytral base wider than base of pronotum. Humeral angles angulate, protrude anterad. Disc regularly convex, not elevated in the postscutellar area (fig. 708), but with distinct postscutellar impressions, bordered by a low fold, and with a distinct postscutellar H-shaped elevation. Puncturation coarse and regular. Surface of elytra finely sculptured. Intervals as wide as or slightly narrower than rows, in the sutural half of disc slightly elevated, especially interval 3, which forms an obtuse costa. Apex of elytral epipleura bare.

Clypeus 1.5 times wider than long, convex, with a sharp tubercle at the top. Labrum broad, emarginate to 1/5 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately broad, with a distinct elongate impression in the middle (fig. 709).

Length ratio of antennal segments: 100: 38: 84: 73: 65: 61: 61: 57: 57: 69: 138, segment 3 approximately 2.2 times longer than segment 2 and approximately 1.2 times longer than segment 4 (fig. 712).

Claws with inner pecten with four teeth extending to 1/4 length of claw (fig. 710), outer pecten with three, very short teeth not extending beyond the margin of claw (fig. 711).

Aedeagus moderately broad, narrowed basally. Apex truncate, without apical process. Apical part gently curved ventrad. Ventral side without membrane (figs 732, 733).

TYPE MATERIAL

Laccoptera sedecimnotata: lectotype: "Java" "BALY" "Type" (NRS).

Laccoptera sedecimnotata sumbae: paratype: "Melolo O. Sumba, 27.5.1949, Dr. Bühler et Sutter" "paratype" (MM); paratype: "Melolo O. Sumba, 26.5.1949" "paratype" (MM).

DISTRIBUTION

Indonesia: Bali, Flores, Java, Lombok, Sumatra, Sumba, Sumbawa (fig. 619).

REMARKS

HINCKS (1953) named ssp. *sumbae* as a new subspecies from Sumba. It is characterized by a finer sculpture of pronotum and smaller elytral spots. It is true that specimens with finer sculpture and less maculation predominate in populations from Sumba. However, having examined many specimens I conclude that the shows little correlation with geographic distribution and therefore synonymize ssp. *sumbae* with nominotypical name.

***Laccoptera (Laccopteroidea) sutteri* HINCKS, 1953**

(figs 632, 713-718, 734, 735, tab. 15: 9)

Laccoptera sutteri HINCKS, 1953: 71; BOROWIEC, 1990 a: 704.

Laccoptera (Laccopteroidea) sutteri: BOROWIEC, 1999: 220.

DIAGNOSIS

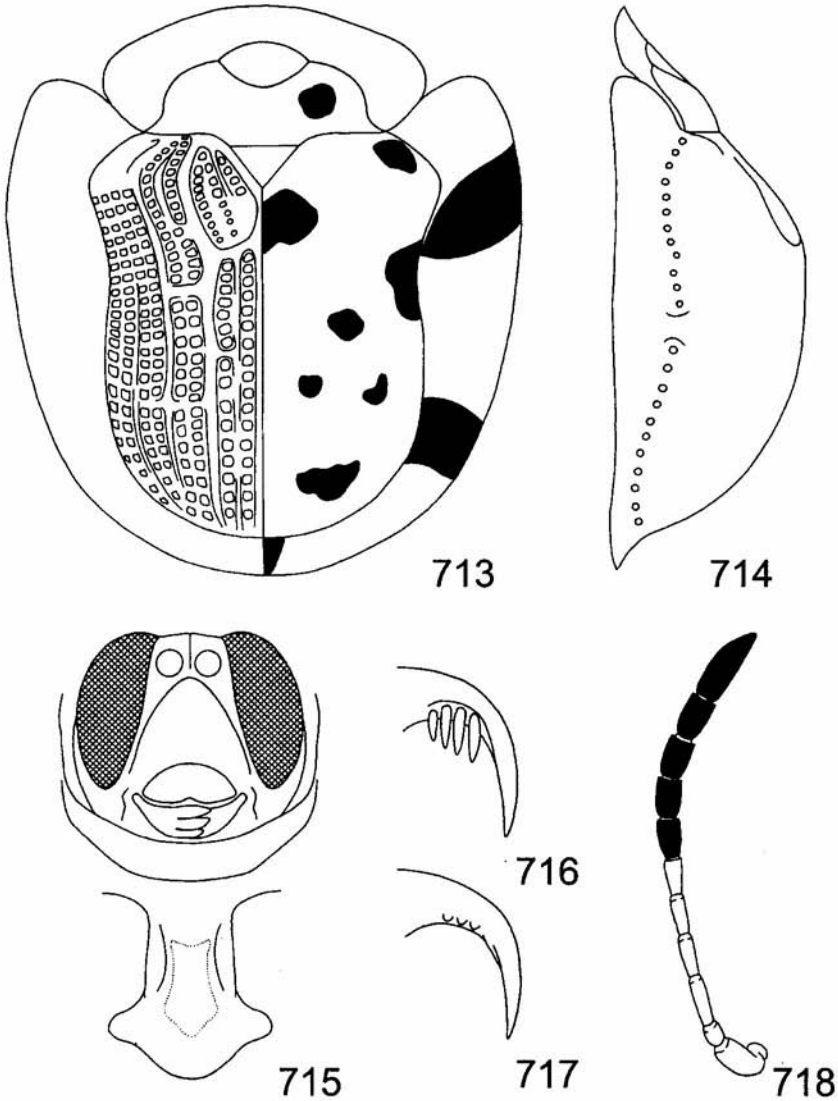
L. sutteri belongs to a group of species from eastern part of Sunda Is. with oval or slightly trapezoidal body and a sutural spot on explanate margin of elytra. The group also comprises *L. fallax* and *L. permodica*. *L. sutteri* differs in a stouter body (L/W 1.14-1.17), wider explanate margin of elytra, and stronger marking of humeral angles. *L. sutteri* has only one spot in the posterior third of elytral disc, while *L. fallax* and *L. permodica* have two or three spots. *L. sutteri* also differs from *L. permodica* in long inner pectens of claws, which on the first pair of tarsi extend to 1/3 length of claw, while in *L. permodica* inner pectens barely reaching beyond the border of claw. At first glance, *L. fallax* is very similar to *L. sutteri* but differs in a smaller body, with length below 8.1 mm, while *L. sutteri* has length above 8.5 mm.

DESCRIPTION

L = 8.9; W = 7.6-7.8; Lp = 2.9; Wp = 4.9; L/W = 1.14-1.17; Wp/Lp = 1.69. Body trapezoidal (fig. 713). Antennae dimorphic, especially last segment distinctly longer in male than in female.

Pronotum dark yellowish-brown, in the middle with two black spots. Scutellum yellowish-brown. Elytral disc yellowish-brown with a black pattern composed of a spot on the humeral callus, a spot in the postscutellar area extending to interval 3, three spots behind half length of disc near the suture, a large spot on the slope, and a large spot behind humeral callus, close to the border of disc. Posterolateral and sutural spots of explanate margin extend slightly beyond border of disc. Explanate margin with humeral, posterolateral and sutural spots, which always extend to the extreme margin of elytra. Humeral spots far from the anterior margin of marginalia (fig. 713). Ventrites mostly black, except for yellow prosternum, and margins of abdomen, basal margins of abdominal sternites. Legs yellow. Antennae mostly yellow, last five segments black.

Pronotum elliptical, 1.69 times wider than long, with maximum width slightly before half length, sides rounded. Disc moderately convex. Surface of disc from slightly dull to slightly shiny, mostly smooth, only its top is slightly irregular or plicate. Explanate margin of pronotum slightly striated longitudinally and dullish.



713-718. *Laccoptera sutteri*: 713 - body in dorsal view, 714 - body in lateral view, 715 - head and prothorax, 716 - inner side of claw, 717 - outer side of claw, 718 - antenna

Elytral base wider than base of pronotum. Humeral angles distinctly angulate, protrude anterad. Disc regularly convex, only slightly elevated in the postscutellar area (fig. 714), with distinct postscutellar impressions, bordered by a low fold. Surface of elytra finely sculptured, with only a few transverse folds, in the postscutellar area with a slight H-shaped elevation. Puncturation coarse, perfectly regular. Intervals approximately two times narrower than rows, slightly elevated; only interval 3 as wide as rows and more elevated than other intervals, forming an obtuse costa, especially in posterior part of disc. Also interval 5 in posterior part of disc is slightly more elevated than are other intervals. Apex of elytral epipleura bare.

Clypeus 1.3 times wider than long, strongly convex with an angulate elevation at the top. Labrum broad, emarginate to 1/5 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, with an elongate impression in the middle (fig. 715).

Length ratio of antennal segments: 100: 45: 100: 86: 82: 68: 77: 72: 82: 82: 163, segment 3 approximately 2.2 times longer than segment 2 and approximately 1.2 times than segment 4 (fig. 718).

Claws with inner pecten with four teeth extending to 1/3 length of claw, last tooth is shortest (fig. 716), outer pecten with three small teeth not extending beyond the margin of claw (fig. 717).

Aedeagus slim, only slightly narrowed basally. Apex truncate, without apical process. Apical part distinctly curved ventrad. Ventral side without membrane (figs 734, 735).

TYPE MATERIAL

Paratype: "West Sumba Pogobina 18.IX" "Paratype" (MM).

DISTRIBUTION

Indonesia: Sumba (fig. 632).

***Lacoptera (Lacopteroidea) tredecimguttata* WAGENER, 1877**

(figs 719-731, 740, 741, 748, tab. 17: 3-6)

Lacoptera tredecim-guttata WAGENER, 1877: 65; SPAETH, 1933d: 498 (as syn. of *philippinensis* BLANCHARD); MEDVEDEV, 1995: 20.

Lacoptera (Lacoptera) tredecim-guttata: SPAETH, 1914 e: 83.

Lacoptera (Lacopteroidea) tredecimguttata: BOROWIEC, 1999: 220.

Lacoptera manilensis WEISE, 1910 a: 144, 1933 d: 498 (as syn. of *philippinensis*).

Lacoptera (Lacoptera) manilensis: SPAETH, 1914 e: 82.

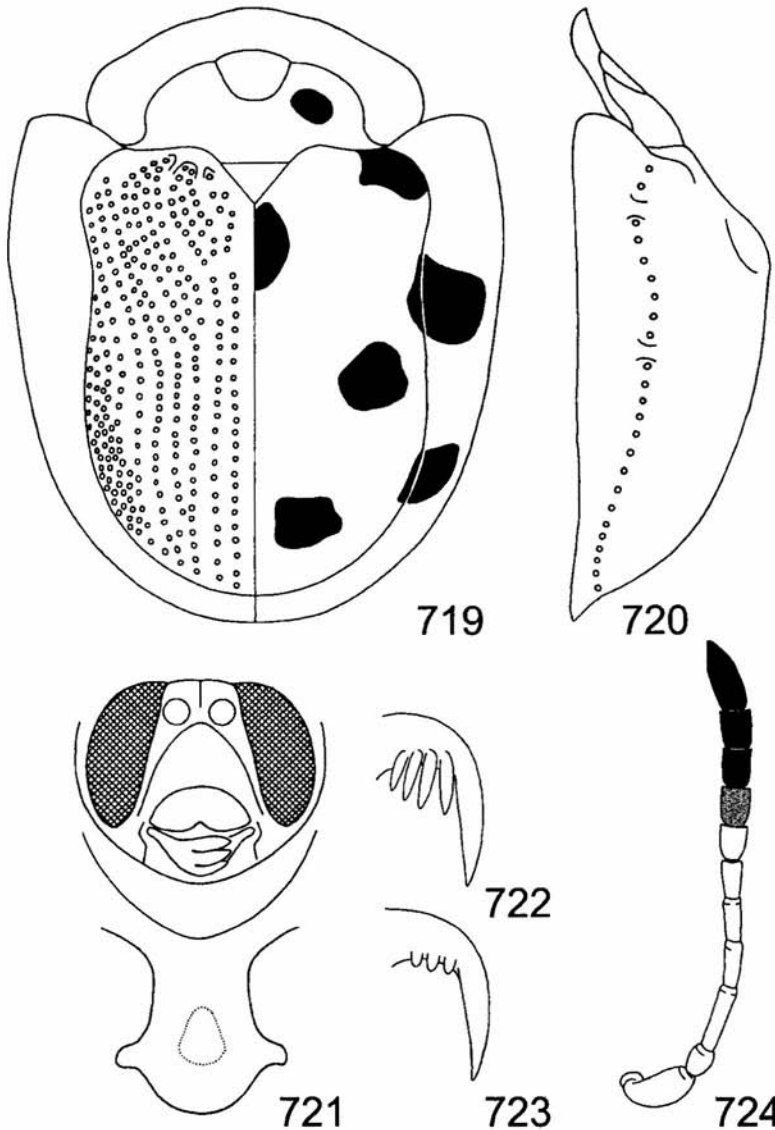
Lacoptera manilensis ab. *nigripennis* WEISE, 1910 a: 144; 1933d: 498 (as syn. of *philippinensis*).

Lacoptera (Lacoptera) manilensis ab. *nigripennis*: SPAETH, 1914 e: 82.

Lacoptera (Lacoptera) luzonica SPAETH, 1914 e: 82 (nom. nov. pro *Lacoptera philippinensis* sensu BOHEMAN, 1855 nec BLANCHARD, 1853), 1933 d: 498 (as syn. of *philippinensis*).

DIAGNOSIS

L. tredecimguttata and *L. tredecimpunctata* form a group of small species, with subtriangular or slightly trapezoidal body, without sutural spot on explanate margin of elytra, and without distinct transverse bands. They are partly sympatric (on Philippines), and show the same type of colour variation, but *L. tredecim-*



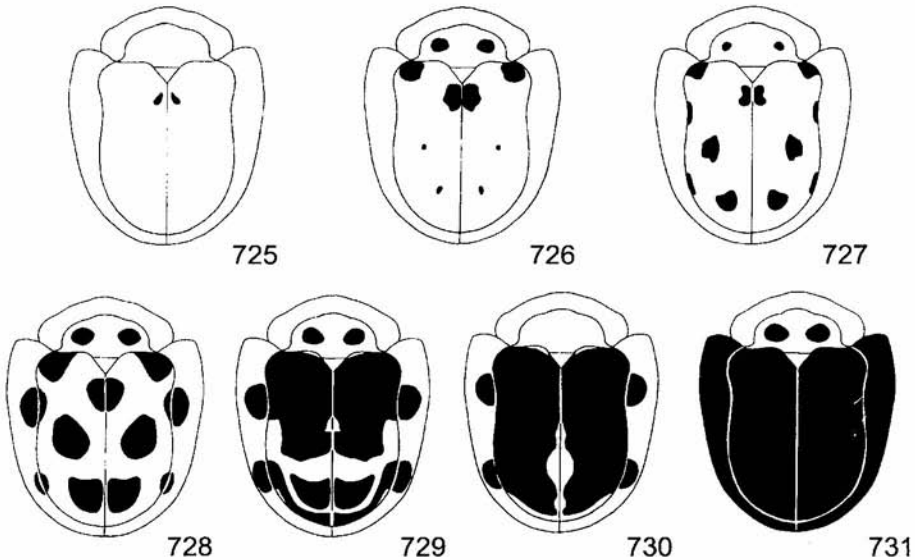
719-724. *Laccoptera tredecimguttata*: 719 - body in dorsal view, 720 - body in lateral view, 721 - head and prosternum, 722 - inner side of claw, 723 - outer side of claw, 724 - antenna

guttata is more variable than *L. tredecimpunctata*. In the exclusive part of the range, especially on Sumatra and Java, *L. tredecimpunctata* is slightly larger and has slightly more triangular body and more angulate humeral angles. In sympatric area on Philippines, the differences are less marked and some specimens show intermediate characters which suggests some levels of hybridization. The best distinguishing character is puncturation of elytral disc, which in *L. tredecimpunctata* is more or less regular on whole disc, and only a few additional punctures on posterolateral parts of disc can be irregular, while in *L. tredecimguttata* puncturation of posterolateral part of disc is always more or less irregular.

DESCRIPTION

$L = 7.1-8.2$; $W = 5.8-6.8$; $Lp = 2.4-2.8$; $Wp = 4.0-4.7$; $L/W = 1.12-1.28$; $Wp/Lp = 1.61-1.75$. Body subtriangular to slightly trapezoidal (fig. 719). Antennae dimorphic, especially last segment distinctly longer in male than in female.

Very variable species. Pronotum yellowish-brown or brownish-red with two black spots on the disc (figs 726-729, 731), which are sometimes reduced to points or completely obsolete (figs 725, 730). Scutellum yellowish-brown or brownish-red. Elytral disc yellowish-brown or brownish-red, usually with a black pattern including a spot in the postscutellar area, extending to interval 3, a spot on humeral callus, a spot in the middle of disc, a spot in apical part of disc close to the suture, and two spots at the border of disc at 1/3 and 2/3 length of elytra (figs. 727, 728). An additional small spot sometimes occurs on interval 3 at half length of disc. Spots on the disc can be reduced or expanded and connected together. In an

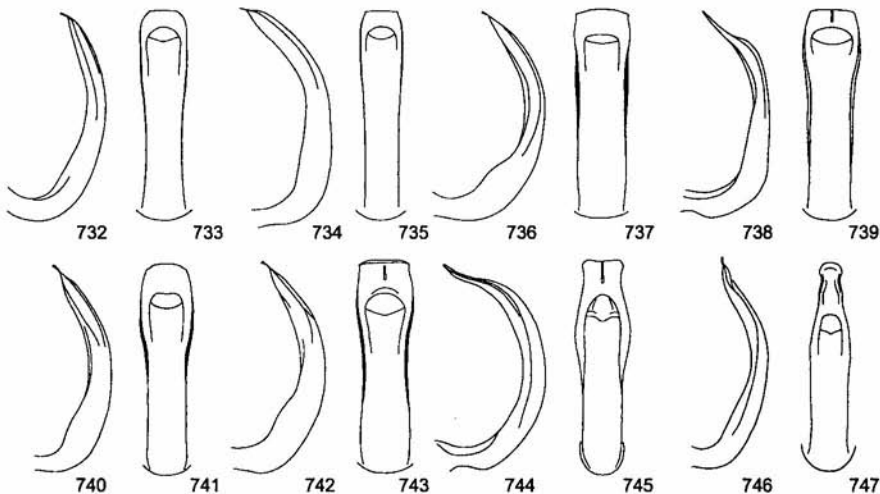


725-731. *Laccoptera tredecimguttata*: variation of dorsal pattern

extremely pale form, the pattern is reduced to two small spots in the the postscutellar area (fig. 725), the disc of extremely dark forms is for the most part or completely black (figs 729-731). Explanate margin usually with circular humeral and posterolateral spots, both extending usually only to half width of marginalia. Humeral spots separated from the anterior margin of marginalia (figs 728-730). Often spots of marginalia are reduced to small prolongation of spots at border of disc, occasionally marginalia completely without spots (figs 725, 726). In the dark form humeral and posterolateral spots increase and connected together by band along border of disc but not extending to margin of elytra, in extreme case whole explanate margin is black (fig. 731). Ventrites yellow, with black transverse spot on metathorax. Legs yellow. Antennae yellow, two to four last segments strongly infusate or black, sometimes also segment 7 infusate.

Pronotum elliptical, 1.61-1.75 times wider than long, with maximum width at 1/3 basal length, sides rounded. Disc moderately convex. Surface of disc usually slightly striated or wrinkled longitudinally, but sometimes completely smooth or only finely punctate. Explanate margin of pronotum slightly striated longitudinally. Surface of whole pronotum usually dullish or only anterior part slightly shiny, rarely whole surface shiny.

Elytral base wider than base of pronotum. Humeral angles angulate but blunt, protrude anterad. Disc convex, distinctly elevated in the postscutellar area (fig. 720), with distinct postscutellar impressions, bordered by a low fold. Surface of elytra finely sculptured. Punctuation moderately coarse and usually dense, in the sutural half of disc usually regular, on the sides and in the posterior part of disc more or less irregular. Numerous additional punctures often occur in anterior part of disc, between rows 1 and 3 and rows 3 and 5. The punctuation of disc is never



732-747. Aedeagi: 732, 733 - *Laccoptera sedecimnotata*; 734, 735 - *L. sutteri*; 736, 737 - *L. yunnanica*; 738, 739 - *L. sedecimmaculata*; 740, 741 - *L. tredecimguttata*; 742, 743 - *L. tredecimpunctata*; 744, 745 - *L. depressa*; 746, 747 - *L. sulcata*; 732, 734, 736, 738, 740, 742, 744, 746 - lateral; 733, 735, 737, 739, 741, 743, 745, 747 - dorsal

entirely regular, otherwise variable between the two extremes: one of predominantly irregular puncturation with only 2-3 sutural rows tending to regularity, and another of an almost regular puncturation except for the posterolateral parts of disc. Spaces between punctures slightly elevated. Intervals, if marked, usually narrower than rows, but three or four sutural intervals may be slightly wider than rows. More elevated than others are usually interval 3, along the whole length, and interval 5 in the apical part of disc, but in some cases all intervals are uniformly elevated or the whole surface of elytra is flat except for folds in the postscutellar area. Explanate margin of elytra with irregular, shallow punctures. Apex of elytral epipleura bare.

Clypeus 1.6 times wider than long, convex, with distinct angulation at the top. Labrum broad, emarginate to 1/4-1/3 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, with a more or less visible elongate impression in the middle (fig. 721).

Length ratio of antennal segments: 100: 35: 100: 68: 64: 53: 50: 57: 57: 57: 114, segment 3 approximately 2.9 times longer than segment 2 and approximately 1.5 times than segment 4, sometimes segments 3 and 4 are equal in length, or segment 3 is only 2.5 times longer than segment 2 (fig. 724).

Inner pecten of claw with four distinct teeth extending to 2/5 length of claw (fig. 722). Outer pecten with two or three teeth extending slightly beyond the margin of claw (fig. 723).

Aedeagus moderately broad, distinctly narrowed basally. Apex truncate, without apical process. Apical part distinctly curved ventrad. Ventral side without membrane (figs 740, 741).

TYPE MATERIAL

Laccoptera tredecimguttata: holotype: "Manila" "Typus" "Stephens Baden" (MM).

Laccoptera manilensis: type not found, a series of specimens from WEISE's collection preserved in ZMHU and named *manilensis* probably includes syntypes, but they are mixed with more recent material (WEISE never labelled types).

Laccoptera manilensis ab. *nigripennis*: type not found (see above).

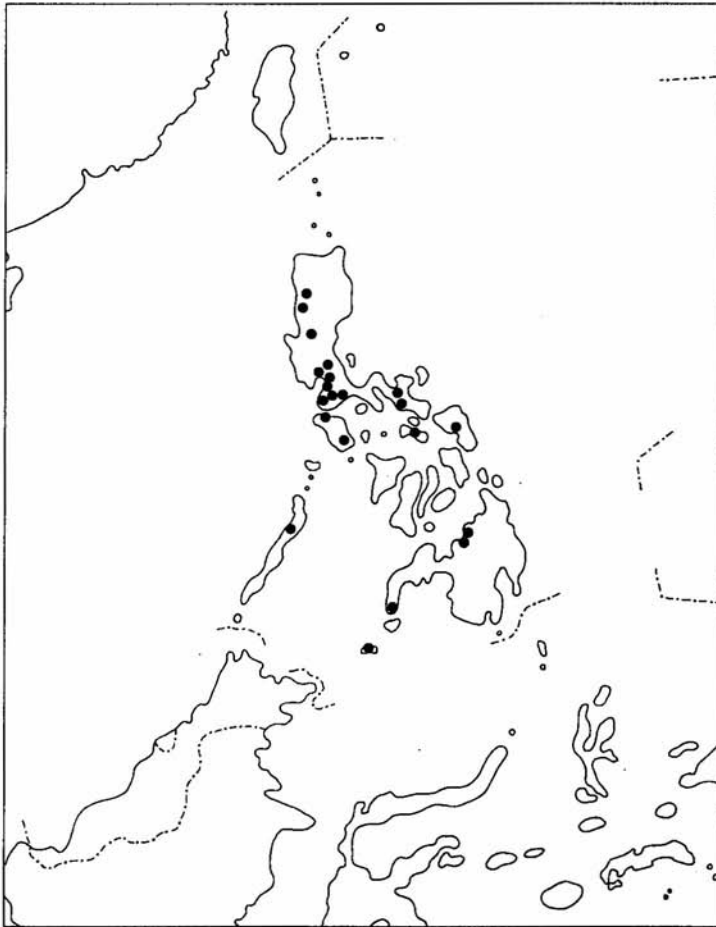
DISTRIBUTION

Philippines: Luzon and adjacent small islands, Mindanao, Palawan. This species is more common on the Philippines than *L. tredecimpunctata* (fig. 748)

REMARKS

There is a nomenclatoric confusion caused by a misinterpretation of the name *Laccoptera philippinensis* (BLANCHARD, 1853). BLANCHARD (1853) noted that his description is based on a specimen from Sumatra. This specimen (holotype) is preserved in MNHN and, undoubtedly, conspecific with *Laccoptera tredecimpunctata* (FABRICIUS, 1801). But in the discussion to his description of *L. philippinensis* BLANCHARD (1853) wrote that the species is common in the

Philippines which is probably why he named it *L. philippinensis*. Because subsequent authors by many years believed that two different allopatric species occurs on Philippines and Sunda Is., the name *L. philippinensis* has been applied for the populations from Philippines despite the fact, that terra typica for the name is Sumatra. However, once it was discovered that two species, *L. tredecimpunctata* F. and *L. philippinensis* auct. occur on the Philippines, while only one species, *L. tredecimpunctata* F. occurs on Sunda Is. SPAETH (1914) suggested, that the name *L. philippinensis* should be applied for the species outside Philippines and proposed a new name *L. luzonica* (= *L. philippinensis* auct.) for populations from Philippines, but later SPAETH (1933) synonymized *L. luzonica* with *L. philippinensis*. In the same paper of 1933 he suggested that *L. manilensis*, as described by WEISE (1910), and *L. tredecimguttata* (WAGENER 1877) also are conspecific with *L. philippinensis* auct. *L. manilensis* and *L. tredecimguttata* are, in fact, conspecific,



748. Distribution of *Laccoptera tredecimguttata*

but different from *L. philippinensis* sensu BLANCHARD and both belong to the taxon described by SPAETH (1914) under the name *L. luzonica*. The name *Laccoptera tredecimguttata* WAGENER, 1877 is the oldest available name for the taxon distributed only on Philippines, while the name *Laccoptera tredecimpunctata* (FABRICIUS, 1801) is the oldest name available for the taxon distributed in both the Philippines and Sunda Is., and thus the name *L. philippinensis* (BLANCHARD, 1853) is its junior synonym.

Anther problem is interesting character observed in some populations. Some fresh adult specimens of *L. tredecimguttata* have short pubescence on the elytra. Those pubescence is worn up in older. I have examined fresh bare and pubescent specimens from the same localities (I observed the same situation *L. fallax*, where a pubescent form was described as a different species under the name *L. timorensis* Sp.). The problem needs verification by genetic studies or observations of immature and adult stages in the field. Unfortunately, bionomics and immature stages are unknown of this very common species (I have examined a thousand of specimens of *L. tredecimguttata*).

***Laccoptera (Laccopteroidea) tredecimpunctata* (FABRICIUS, 1801)**

(figs 742, 743, 749-761, tab. 17: 1, 2)

Cassida 13 punctata FABRICIUS, 1801: 398; SCHÖNHERR, 1817: 221 (*tredecimpunctata*); ZIMSEN, 1964: 90.

Laccoptera tredecimpunctata: BOHEMAN, 1855: 73, 1856: 155, 1862: 385; BALY, 1863: 14; GEMMINGER and HAROLD, 1876: 3663; WEISE, 1897: 104 (*13-punctata*); 1905: 123; SPAETH, 1900: 23 (*13-punctata*), 1912: 122 (*tredecim-punctata*), 1926 c: 119, 1932 c: 136; 1933: 498; MAULIK, 1919: 350 (incl. fig.); GRESSITT, 1938 c: 582; 1952: 472; GRESSITT and KIMOTO, 1963: 957; LIZHONG, 1982: 55; BOROWIEC, 1985: 28; 1990 a: 704, 1996: 37; CHEN et al., 1986: 577, 635 (incl. fig.); BOROWIEC and TAKIZAWA, 1991: 638; KIMOTO et al., 1995: 108 (incl. photo); REID, 1997: 40; KIMOTO, 1998: 37 (incl. colour photo); MOHAMEDSAID, 2000 a: 359, 2000 b: 377.

Laccoptera (Laccopteroidea) tredecim-punctata: SPAETH, 1914 e: 83.

Laccoptera tridecimpunctata [sic]: GRESSITT, 1939: 141.

Laccoptera (Laccopteroidea) tredecimpunctata: BOROWIEC, 1999: 220.

Aspidomorpha philippinensis BLANCHARD, 1853: 321; SPAETH, 1914 e: 83 (as syn. of *tredecimpunctata*).

Laccoptera philippinensis: BOHEMAN, 1855: 79, 1856: 156, 1862: 386; GEMMINGER and HAROLD, 1876: 3662; WEISE, 1892: 385; SPAETH, 1933: 498 (as bona sp.); BOROWIEC, 1990 a: 702, 1996: 36.

Cassida miliaris: HERBST, 1799: 312 (misidentification); SCHÖNHERR, 1817: 221; SPAETH, 1914 e: 83 (as syn. of *tredecimpunctata*).

Laccoptera indica Dej.: GEMMINGER and HAROLD, 1876: 3663 (nomen nudum).

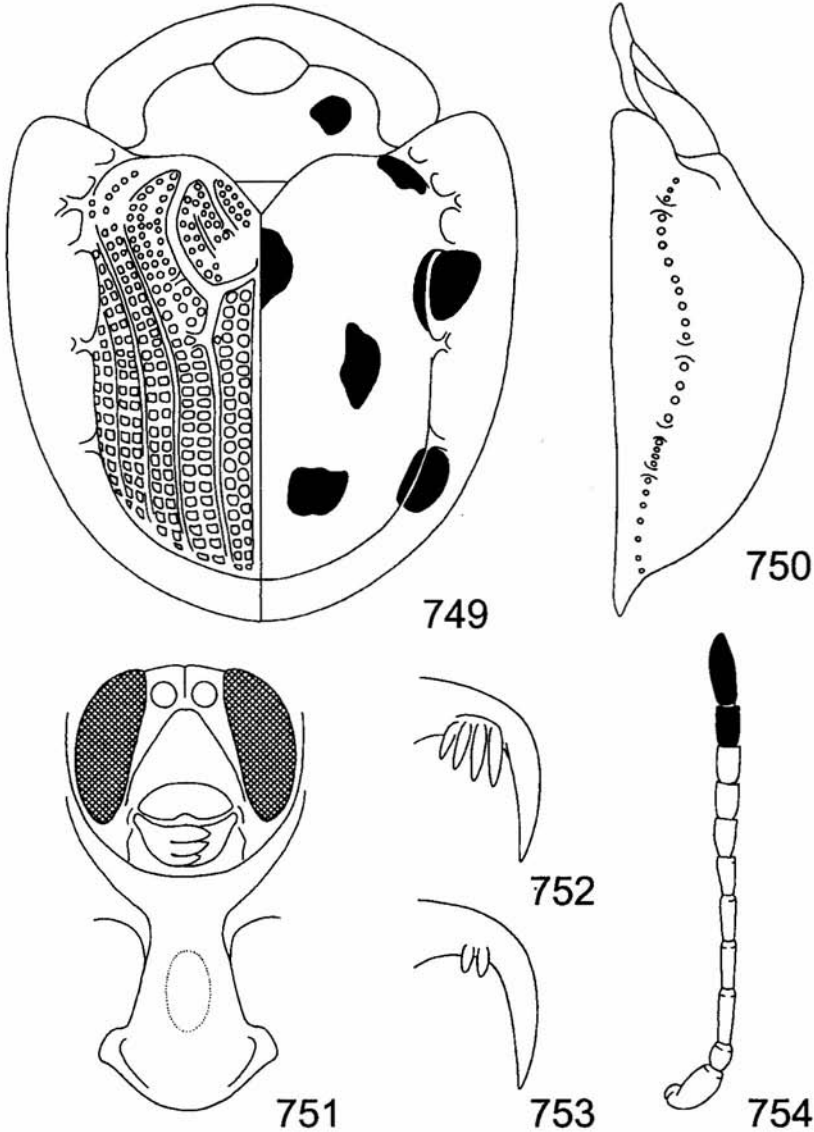
Laccoptera 4-punctata Megerle: GEMMINGER and HAROLD, 1876: 3663 (nomen nudum).

Laccoptera 3-punctata Dahl: GEMMINGER and HAROLD, 1876: 3663 (nomen nudum).

DIAGNOSIS

L. tredecimpunctata and *L. tredecimguttata* form a group of small species, with subtriangular or slightly trapezoidal body, without sutural spot on explanate margin of elytra, and without distinct transverse bands. They are distributed mostly on islands of the Oriental Region (continental records of *L. tredecim-*

punctata are probably based on introduced specimens) and partly sympatric on the Philippines. The colour variation in both species is of the same type, but *L. tredecimguttata* is more variable than *L. tredecimpunctata*. For distinguishing characters see diagnosis of *L. tredecimguttata*.

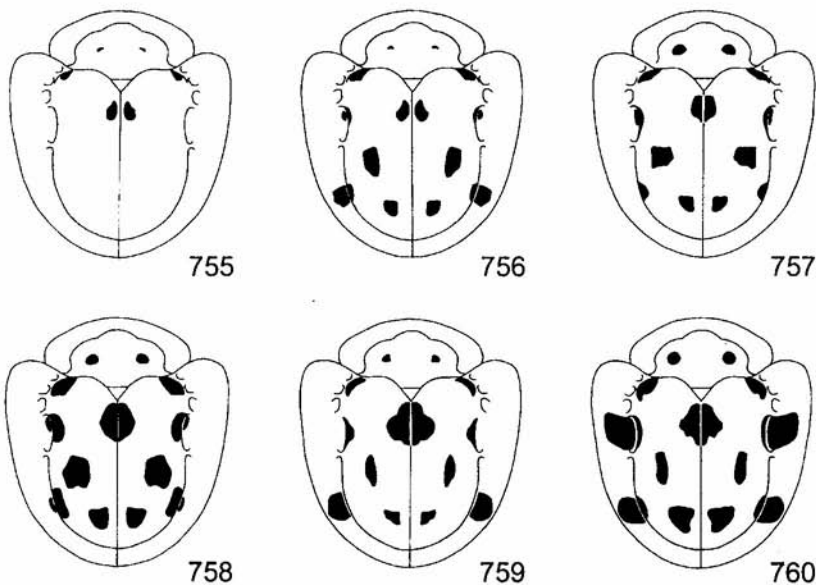


749-754. *Laccoptera tredecimpunctata*: 749 - body in dorsal view, 750 - body in lateral view, 751 - head and prosternum, 752 - inner side of claw, 753 - outer side of claw, 754 - antenna

DESCRIPTION

$L = 6.8-8.4$; $W = 5.7-7.2$; $L_p = 2.3-2.8$; $W_p = 4.0-4.7$; $L/W = 1.14-1.28$; $W_p/L_p = 1.63-1.82$. Body subtriangular or slightly trapezoidal (fig. 749). Antennae dimorphic, especially last segment distinctly longer in male than in female.

Pronotum yellow or yellowish-brown with two black spots on the disc, sometimes reduced to small points, occasionally completely obsolete (755-760). Spots on the pronotal disc usually smaller than those in *L. tredecimguttata*. Scutellum yellow to yellowish-brown. Elytral disc yellow to yellowish-brown with black spots: a spot in the postscutellar area extending to interval 3, a spot on humeral callus, a spot in the middle of disc, a spot in the apical part of disc close to the suture, and two spots at the border of disc at 1/3 and 2/3 length of disc (figs 756-760). Sometimes there is an additional small spot on interval 3 at half length of disc. Spots on the elytral disc usually smaller and less regular than those in *L. tredecimguttata*. Occasionally the spots are more or less reduced (fig. 755), and the elytral disc is never partly or completely black (which is common in *L. tredecimguttata*). Explanate margin with humeral and posterolateral spots, humeral spot is placed below humeral callus, and its anterior margin is far from the anterior margin of marginalia. Both spots usually extend only to 1/3-1/2 width of explanate margin, but sometimes almost reach the lateral margin of elytra (fig. 760). Elongate humeral and posterolateral spots predominate in forms from Sumatra and Java, while predominate forms with these spots are mostly more or less circular and do not extend behind half width of marginalia in forms from Borneo and the Philippines. Occasionally, these spots are mostly reduced and form short extension of the border spots of disc. Specimens without humeral spots are

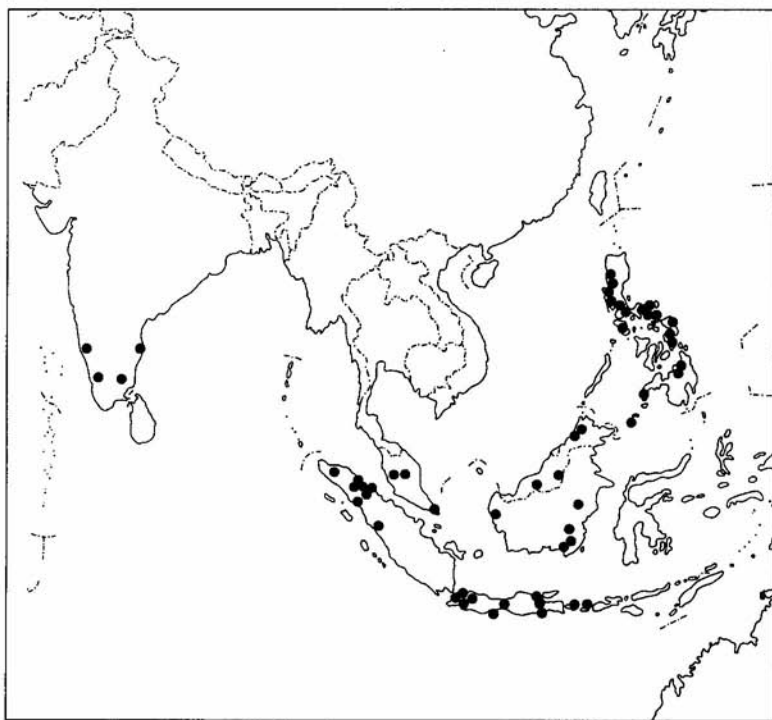


755-760. *Laccoptera tredecimpunctata*: variation of dorsal pattern

extremely rare in *L. tredecimpunctata* and common in *L. tredecimguttata*. Ventriles yellow, with a black transverse spot on metathorax, occasionally ventrites uniformly yellow. Legs yellow. Antennae yellow, two to three last segments strongly infusate or black, sometimes only last segment infusate.

Pronotum elliptical, 1.63-1.82 times wider than long, with maximum width at 1/3 basal length, sides rounded. Disc moderately convex. Surface of disc usually finely striated longitudinally or wrinkled, but in some specimens disc almost smooth or slightly punctured, in populations from Java and Sumatra the disc is usually distinctly wrinkled, in populations from Borneo and the Philippines it is less wrinkled or without sculpture. Explanate margin of pronotum slightly striated longitudinally. Surface of the whole pronotum usually somewhat glossy, rarely the whole surface dullish (in *L. tredecimguttata* dull specimens are more common than glossy).

Elytral base wider than base of pronotum. Humeral angles angulate, protrude anterad. Disc convex, distinctly elevated in the postscutellar area (fig. 750), with distinct, bordered by a low fold postscutellar impressions. Surface of elytra finely sculptured. Punctuation coarse or moderately coarse, usually very dense and regular, but some rows run slightly irregular, especially in posterolateral part of disc because intervals are very narrow and linear. A few additional punctures on sides of disc also disturb the regularity, but punctuation in the posterolateral part of disc never is as



761. Distribution of *Laccoptera tredecimpunctata*

irregular as in *L. tredecimguttata*. Spaces between punctures slightly elevated. Intervals, if marked, linear and usually narrower than rows, only three or four sutural intervals can be slightly wider than rows. Usually more elevated than others are interval 3 (along its entire length) and interval 5 (in the apical part of disc). In some cases all intervals uniformly elevated or the whole surface of elytra flat, except for the folds in the postscutellar area. Specimens with distinctly elevated sutural intervals predominate in populations from Java and Sumatra. Explanate margin with shallow, coarse punctures. The whole surface elytra usually somewhat glossy but in some specimens dullish. Apex of elytral epipleura bare.

Clypeus 1.5 times wider than long, convex, distinctly angulated at the top. Labrum broad, emarginate to 1/4 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, with more or less visible elongate impression in the middle, very deep in specimens from Sumatra and Java and shallow in specimens from the Philippines (fig. 751).

Length ratio of antennal segments: 100: 42: 88: 77: 73: 61: 61: 57: 61: 65: 115, segment 3 approximately 2.1 times longer than segment 2 and approximately 1.1 times than segment 4, but sometimes segments 3 and 4 are of equal length, and segment 3 is 2.5 times longer than segment 2 (fig. 754).

Inner pecten of claw with four distinct teeth extending to 2/5 length of claw (fig. 752). Outer pecten with two or three teeth only slightly extending beyond the margin of claw (fig. 753).

Aedeagus moderately broad, slightly narrowed basally. Apex truncate, without apical process, aedeagus in the apical part is more distinctly parallel-sided than in related *L. tredecimguttata*. Apical part distinctly curved ventrad. Ventral side without the membrane (figs 742, 743).

TYPE MATERIAL

Laccoptera tredecimpunctata: type lost.

Laccoptera philippinensis: holotype: "Museum Paris, Sumatra-Radia Bassa, Jacquinet 1841" (MNHN).

DISTRIBUTION

Cambodja: Kiri Rom; China: Guangdong, Hainan; S India: Tamil Nadu; Indonesia; Philippines: Leyte, Luzon, Mindoro, Samar; Thailand (fig. 761). Probably introduced in continental localities.

REMARKS

See under *Laccoptera tredecimguttata*.

***Laccoptera (Laccopteroidea) yunnanica* SPAETH, 1914**

(figs 619, 736, 737, 762-770, tab. 15: 7, 8)

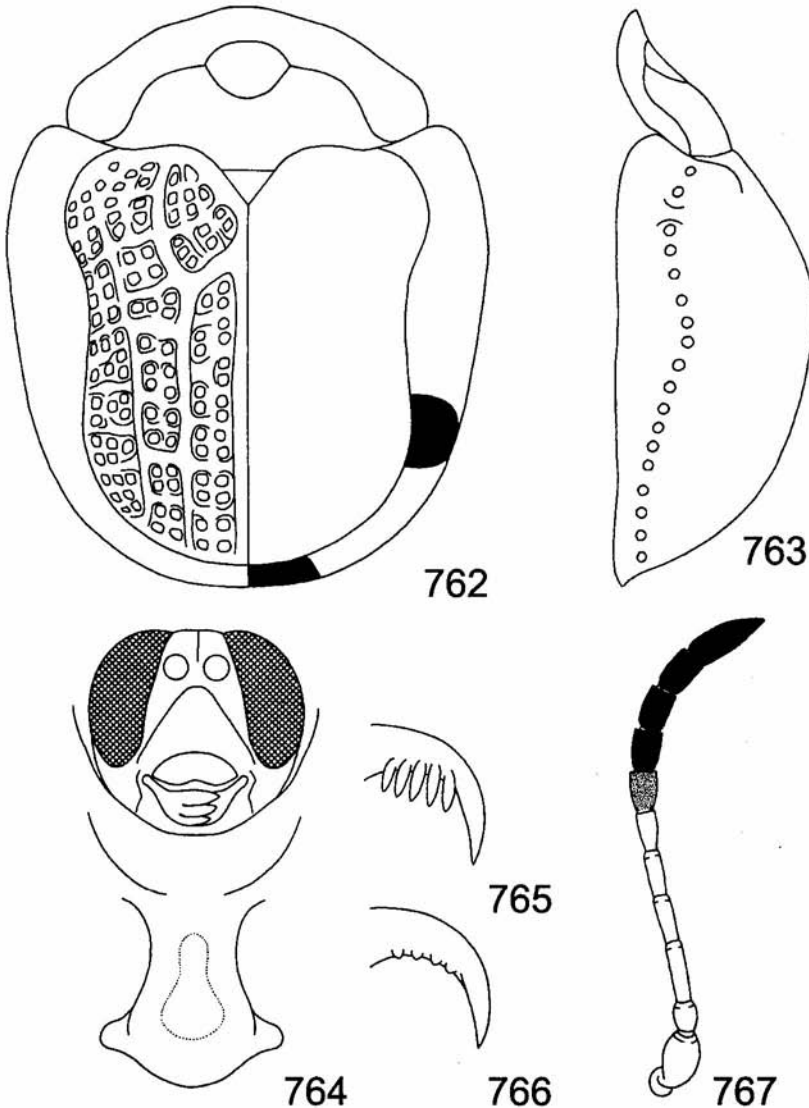
Laccoptera yunnanica SPAETH, 1914 b: 226; GRESSITT, 1952: 473; CHEN and ZIA, 1961: 441; GRESSITT and KIMOTO, 1963: 957; CHEN et al., 1986: 577, 635.

Laccoptera (Laccoptera) yunnanica: SPAETH, 1914 c: 83.

Laccoptera (Laccopteroidea) yunnanica: BOROWIEC, 1999: 221.

DIAGNOSIS

Well distinguished by its yellowish-red or reddish-brown ground colour of body and elytral disc usually uniformly coloured without distinct spots. The only species in which most specimens have only posterolateral spots on the explanate



762-767. *Laccoptera yunnanica*: 762 - body in dorsal view, 763 - body in lateral view, 764 - head and prosternum, 765 - inner side of claw, 766 - outer side of claw, 767 - antenna

margin of elytra (only one examined specimen also had humeral spots). Sculpture of pronotum and elytron the strongest within the subgenus *Laccopteroidea*. The strongly developed pronotal and elytral sculpture suggest an intermediate position between subgenera *Orphnodella* (mostly African) and *Laccopteroidea* (mostly Oriental).

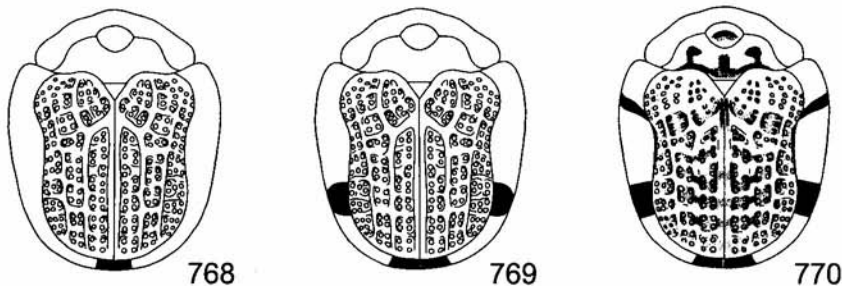
DESCRIPTION

L = 7.4-7.8; W = 5.8-6.2; Lp = 2.7; Wp = 4.6-4.7; L/W = 1.25-1.27; Wp/Lp = 1.70-1.74. Body shortoval (fig. 762). Antennae dimorphic, especially last segment distinctly longer in male than in female.

Pronotum and scutellum yellowish-red or brownish-red. Disc of pronotum without spots, occasionally with indistinct, small, darker areas on the top (fig. 770). Elytra yellowish-red or brownish-red, elytral disc usually without spots or at most with numerous small, black spots spread irregularly over its whole surface. Explanate margin usually with black posterolateral and sutural spots (fig. 769) and, occasionally, with narrow humeral spots, which are separated from the anterior margin of marginalia but extend to the lateral margin of elytra (fig. 770). In the palest forms, the humeral spot obsolete and sutural spot barely marked, reduced to a line along the sutural elevation (fig. 768). Ventrites yellowish-red or brownish-red, with a black spot on metathorax and black spots at the base of abdominal sternites. Legs yellowish-red or brownish-red. In forms with darker legs, the femora with a brownish ring in the middle. Antennae yellowish-red, five last segments black, sometimes segment 7 infusate.

Pronotum elliptical, 1.70-1.74 times wider than long, with maximum width at 1/3 basal length, sides rounded. Disc moderately convex. The entire surface strongly wrinkled. Sometimes a deep groove along the middle of disc.

Elytral base moderately wider than base of pronotum. Humeral angles rounded, protrude anterad. Disc regularly convex, without a tubercle in the postscutellar area (fig. 763), but with a distinct H-shaped elevation and distinct postscutellar impressions. Elytral surface strongly sculptured. Puncturation extremely coarse, punctures almost touch each other and form more or less regular rows, but numerous folds and wrinkles disturb the regularity. Intervals mostly invisible, irregularly linear, only interval 3 project as a distinct costa, and interval 5 projects as a narrow, sharp costa in the middle and toward the apex of disc. Explanate margin with irregular, coarse



768-770. *Laccoptera tredecimguttata*: variation of dorsal pattern

punctures. The entire surface of elytra usually somewhat glossy but in some specimens dullish. Apex of elytral epipleura bare.

Clypeus 1.6 times wider than long, convex, distinctly angulate at the top. Labrum broad, emarginate to 1/6 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, with an elongate, broad impression in the middle (fig. 764).

Length ratio of antennal segments: 100: 43: 96: 71: 71: 57: 57: 60: 64: 64: 125, segment 3 approximately 2.2 times longer than segment 2 and approximately 1.4 times than segment 4 (fig. 767).

Inner pecten of claw with five teeth extending to 2/5 length of claw (fig. 765). Outer pecten with four fine teeth extending only to the margin of claw (fig. 766).

Aedeagus broad, almost parallel-sided. Apex truncate, without an apical process. Apical part strongly curved ventrad. Ventral side without the membrane (figs 736, 737).

TYPE MATERIAL

2 syntypes: "Jünnan, Donckier, cotypus" (MM).

DISTRIBUTION

China: Yunnan (fig. 619).

Subgenus: *Orphnodella* SPAETH, 1902

Body elongateoval, base of elytra only slightly wider than pronotum. Sculpture of pronotum and elytra very strong, with wrinkles, folds, and costae. Elytral sides with simple margination. Claws with distinct inner pecten, outer pecten barely marked or completely obsolete. Elytra usually without distinct pattern.

22 species, mostly in Africa, only two in the Oriental Region.

KEY TO SPECIES

1. Elytra uniformly black, pronotum black with two yellow spots on anterior margin.
.....*foveolata*
- Elytra and pronotum yellow with brown pattern.
.....*jawalagiriana*

***Laccoptera (Orphnodella) foveolata* (BOHEMAN, 1856)**

(figs 680, 771-776, 813, 814, tab. 14: 8)

Cassida foveolata BOHEMAN, 1856: 116, 1862: 284.

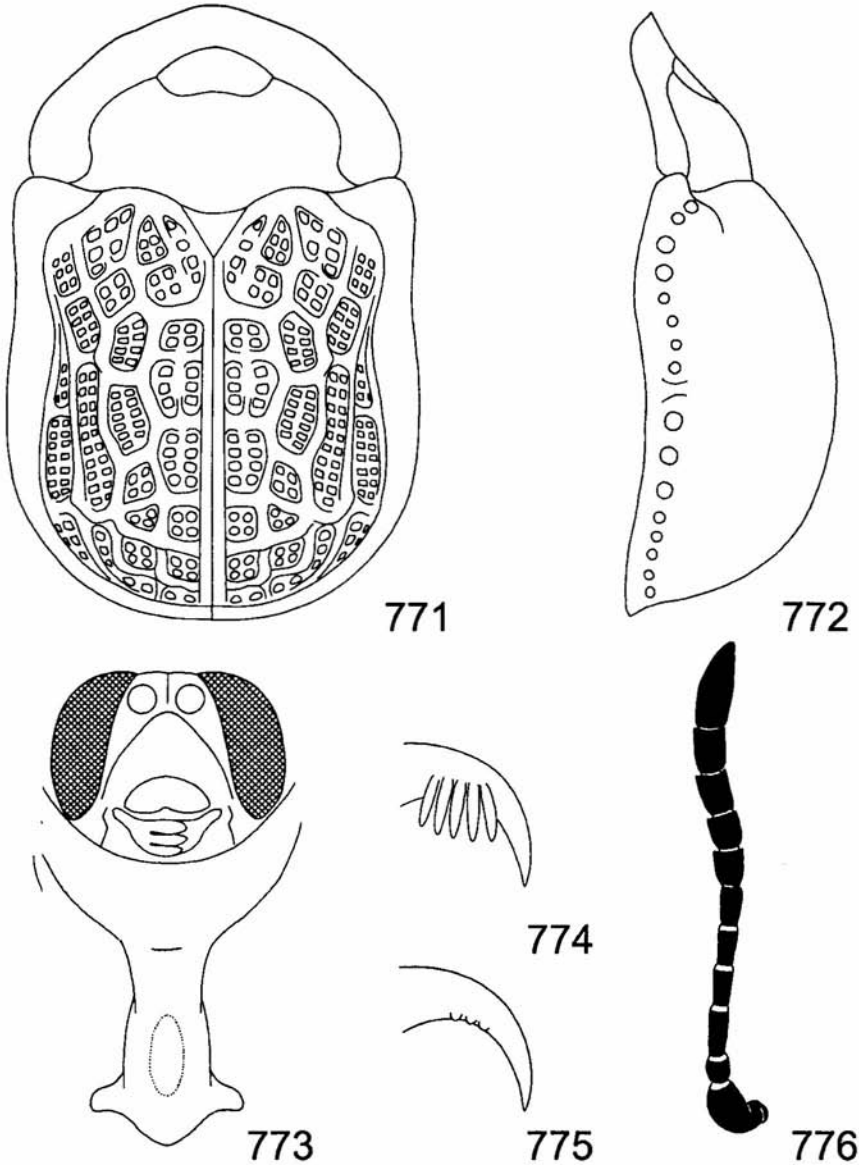
Aspidomorpha foveolata: GEMMINGER and HAROLD, 1876: 3649.

Laccoptera (Laccoptera) foveolata: SPAETH, 1914 c: 82.

Laccoptera (Indocassis) foveolata: SPAETH in HINCKS, 1952: 345.

Sindia foveolata: MAULIK, 1919: 343.

Laccoptera (Orphnodella) foveolata: BOROWIEC, 1999: 223.



771-776. *Laccoptera foveolata*: 771 - body in dorsal view, 772 - body in lateral view, 773 - head and prosternum, 774 - inner side of claw, 775 - outer side of claw, 776 - antenna

DIAGNOSIS

Differs from other Oriental species of the genus *Lacoptera* in having body almost completely black. At first glance, the most similar to African *Lacoptera cicatricosa* (Boh.) (type species for the subgenus *Orphnodella*). *L. cicatricosa* differs in stronger pronotal sculpture of broad wrinkles, deeper sculpture of elytral disc, with narrower and higher folds and costae, and in clypeus more convex but with fine punctures. Clypeus and basal segments of antennae are usually partly yellow or yellowish-brown in *L. cicatricosa*, and black in *L. foveolata*.

DESCRIPTION

L = 7.5-8.4; W = 5.1-6.0; Lp = 2.4-2.6; Wp = 4.4-4.9; L/W = 1.40-1.47; Wp/Lp = 1.83-1.88. Body elongateoval, almost parallel-sided (fig. 771). Sexual dimorphism indistinct, with antenna, especially its last segment slightly longer in male.

Pronotum black with two, elongate, yellow windows at the anterior margin. Scutellum, elytra, ventrites, and legs black. Antennae uniformly black or three basal segments brownish-yellow on ventral sides brownish-yellow.

Pronotum almost semicircular, 1.83-1.88 times wider than long, with maximum width nearly at the basal margin. Disc moderately convex, on the sides distinctly separated by grooves from the explanate margin. Surface of disc strongly sculptured with numerous wrinkles and elongate punctures. Explanate margin irregularly wrinkled.

Elytral base only slightly wider than base of pronotum. Humeral angles narrowly rounded, strongly protrude anterad. Elytral disc regularly convex, slightly depressed at the top, without postscutellar tubercle (fig. 772). Surface of elytra strongly sculptured. Numerous folds form irregular reticulation, thus rows and intervals are fragmented and difficult to follow, only two to three more or less regular rows are distinguishable on the sides of disc. Puncturation coarse, the reticulated areas very dense, punctures touch each other. A zigzag elevation in the position of interval 3. Marginalia narrow, their surface irregular. Apex of elytral epipleura bare.

Clypeus 1.8 times wider than long, convex, with distinct angulation at the top. Labrum broad, emarginate to 1/6 length. Mandibles with distinct teeth. Prosternal process rhomboidal, narrow, with an elongate, broad impression (fig. 773).

Length ratio of antennal segments: 100: 36: 75: 57: 57: 50: 50: 61: 61: 132, segment 3 approximately 2.1 times longer than segment 2 and approximately 1.3 times than segment 4 (fig. 776).

Inner pecten with five teeth extending to half length of claw (fig. 774), outer pecten with three fine teeth extending only to the margin of claw (fig. 775).

Aedeagus distinctive, with the apical part expanded, apex not truncate, with a broad apical process (figs 813, 814).

TYPE MATERIAL

Holotype: "Capt. Downed" "*Cassida foveolata* n. sp. type" "Type" (BMNH).

DISTRIBUTION

Burma; India (fig. 680).

***Lacoptera (Orphnodella) jawalagiriana* (SPAETH, 1936)**

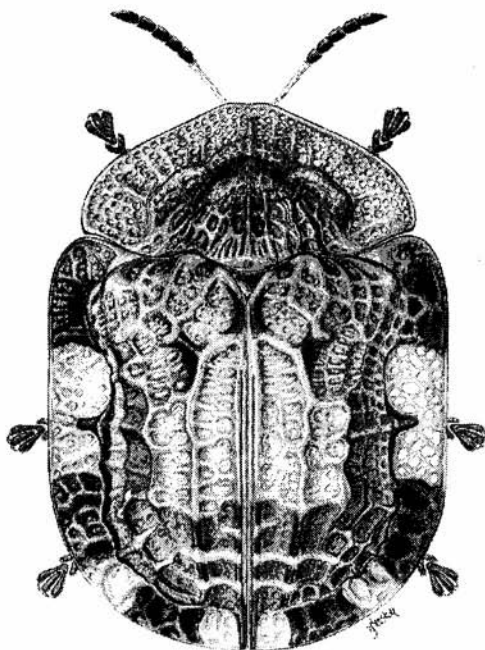
(figs 777-783, tab. 14: 7)

Sindia jawalagiriana SPAETH, 1936 d: 8.

Lacoptera (Orphnodella) jawalagiriana: BOROWIEC, 1999: 223.

DIAGNOSIS

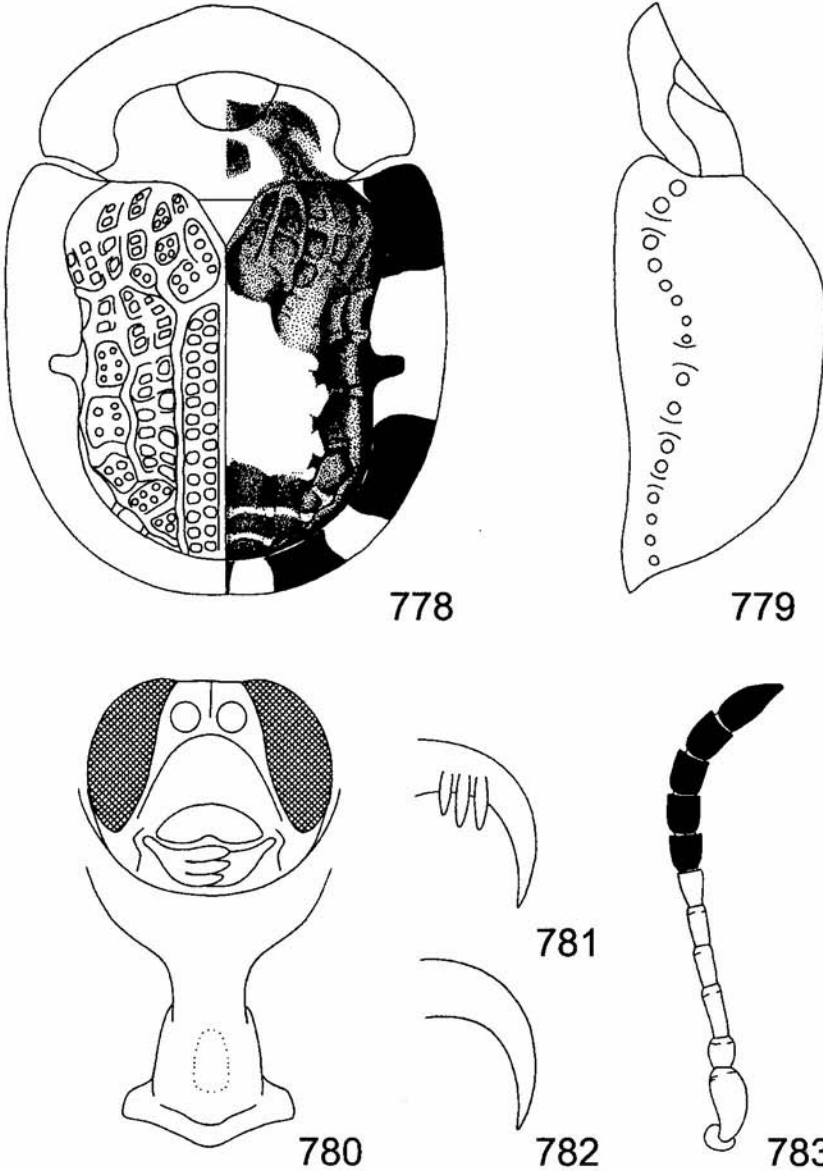
From *L. foveolata*, the other Oriental species of subgenus *Orphnodella*, *L. jawalagiriana* differs in having body partly yellow, and elytra with a distinct pattern. From oriental species of the subgenus *Lacopteroidea* it differs in having body elongate, and in base of elytra only slightly wider than base of pronotum. From the only member of the subgenus *Sindiolina* it differs in strong sculpture of pronotum and elytra. From species of the subgenus *Sindiola* it differs in obsolete outer pectens of claws. Only both species of the subgenus *Sindia* have strong sculpture of elytra similar as in *L. jawalagiriana*, but they are larger and have double marginate elytral sides, while in the subgenus *Orphnodella* elytral margin is simple marginate.



777. *Lacoptera jawalagiriana*, habitus

DESCRIPTION

L = 7.0; W = 5.0; Lp = 2.0; Wp = 4.3; L/W = 1.40; Wp/Lp = 2.15. Body long-oval (fig. 777, 778). Sexual dimorphism unknown, the only examined specimen was female.



778-783. *Laccoptera jawalagiriana*: 778 - body in dorsal view, 779 - body in lateral view, 780 - head and prosternum, 781 - inner side of claw, 782 - outer side of claw, 783 - antenna

Pronotum yellow, on top of disc with indistinct brownish spots form half-ring figure around the top of disc and a central spot in the middle of of the half-ring. Scutellum brown. Elytral disc yellow at the top, around sides with a broad ring of yellowish-brown, brown and brownish-black spots. Explanate margin of elytra with broad humeral, posterolateral, apical, and sutural spots. Humeral spot extends to the anterior margin of elytra with a yellow spot in front of humeral callus (fig. 777, 778). Ventriles and legs uniformly yellow. Antennae yellow, five last segments black.

Pronotum almost semicircular, 2.15 times wider than long, with maximum width in 1/4 basal length, sides rounded, posterior corners well marked. Base of pronotum distinctly emarginate on the sides. Disc convex, its whole surface with numerous, irregular wrinkles. A sharp carina in th middle of disc. Explanate margin irregularly wrinkled, distinctly separated from the disc by a groove.

Elytral base only slightly wider than base of pronotum. Humeral angles rounded, moderately protrude anterad. Elytral disc regularly convex, slightly depressed at the top, without tubercles (fig. 779), but with a H-shaped distinct elevation in the postscutellar area and distinct postscutellar impressions. Surface of elytra strongly sculptured. Numerous folds form irregular reticulation, rows and intervals are difficult to distinguish, also on the sides of disc. Puncturation coarse, in the reticulated areas very dense, punctures touch each other. Sharp, zigzag costae in position of intervals 3 and 5. Marginalia narrow, their surface irregular. Apex of elytral epipleura bare.

Clypeus 1.8 times wider than long, convex, at the top with distinct angulation. Labrum broad, emarginate to 1/4 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, with an elongate impression (fig. 780).

Length ratio of antennal segments: 100: 40: 69: 56: 53: 47: 47: 50: 50: 53: 90, segment 3 approximately 1.7 times longer than segment 2 and approximately 1.2 times than segment 4 (fig. 783).

Inner pecten with three distinct teeth extending to 2/5 length of claw (fig. 781), outer pecten completely obsolete (fig. 782).

Aedeagus not examined, the only examined specimen was female.

TYPE MATERIAL

Holotype: "Jawalagiri, North Salem., F.R.I. Sandal Insect Survey" "22 III 1930" "Type" (BMNH).

DISTRIBUTION

India: Jawalagiri. Known only from two specimens.

Subgenus: *Sindia* WEISE, 1897

Large cassids, body length above 10 mm. Elytra elongate, almost parallel-sided, sides with double margination. Elytral sculpture strong, consists of coarse

punctures, folds, and costae. Claws with distinct inner pecten and almost or completely obsolete outer pecten.

Two species exclusively in India.

KEY TO SPECIES

1. Body length below 11,8 mm. Base of pronotum on the sides shallowly emarginate. Marginalia of pronotum without spots at the base. Apical process of aedeagus broad, truncate or shallowly emarginate (fig. 744).
..... *depressa*
- Body length above 11,9 mm. Base of pronotum on the sides deeply emarginate. Marginalia of pronotum usually with spots at the base. Apical process of aedeagus narrow and rounded (fig. 746).
..... *sulcata*

***Laccoptera (Sindia) depressa* n. sp.**
(figs 7444, 745, 784-788, tab. 14: 6)

ETYMOLOGY

Named after its depressed elytral disc.

DIAGNOSIS

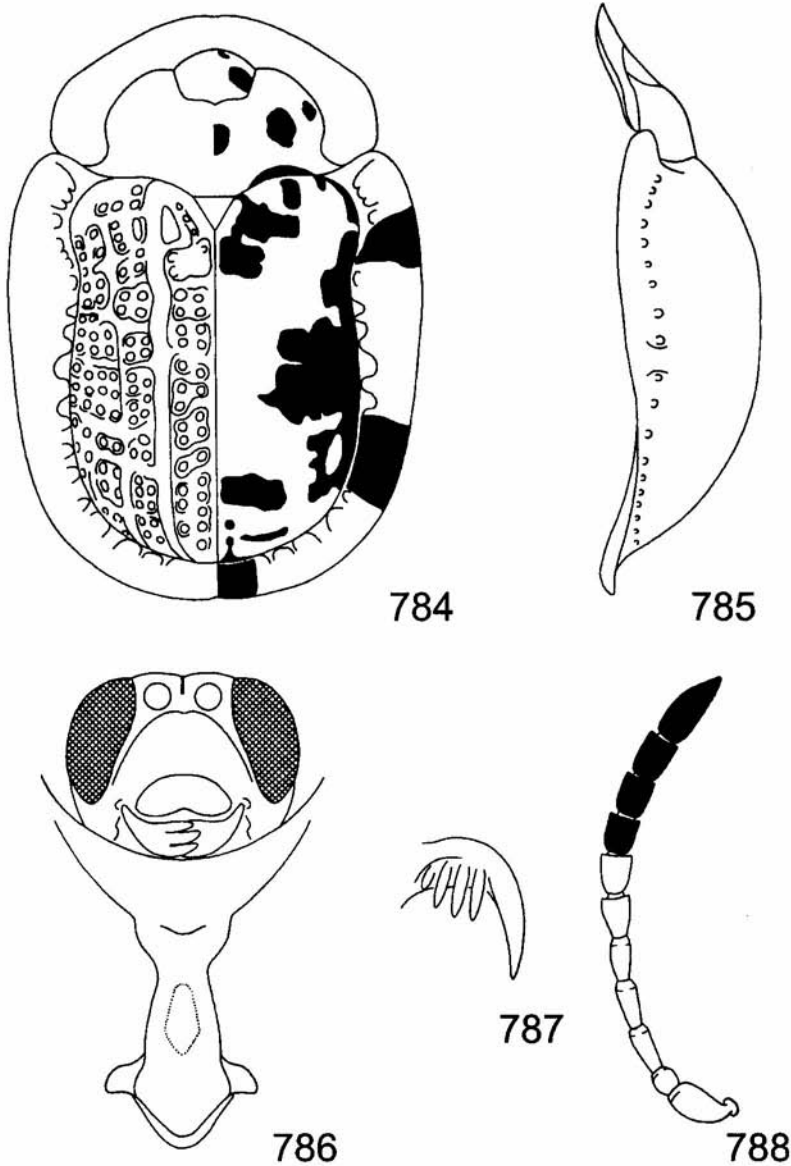
At first glance very similar to *L. (S.) sulcata*, the other member of the subgenus *Sindia*, but *L. depressa* is distinctly smaller (length below 11.8 mm, in the congener above 11.9 mm), and more depressed. Explanate margin of pronotum is always without spots in *L. depressa*, and usually with basal spots in *L. sulcata*. Sides of the base of pronotum are less emarginate in *L. depressa* than in *L. sulcata*. Apex of aedeagus is broad, truncate or shallowly emarginate in *L. depressa*, and narrow, rounded in *L. sulcata*.

DESCRIPTION

L = 11.0-11.7; W = 7.4-8.0; Lp = 3.2-3.6; Wp = 5.9-6.7; L/W = 1.42-1.48; Wp/Lp = 1.76-1.91. Body oval, almost parallel-sided (fig. 784). Sexual dimorphism barely marked, last antennal segment slightly longer in the male.

Pronotum yellowish-brown to reddish brown with eleven spots: one in the middle of disc, four in the area above the head, two on each side of the disc, and two at the basal margin. Sometimes disc without spot in the middle of disc and spots above the head. Scutellum yellowish-brown to reddish-brown. Elytral disc yellowish-brown to reddish-brown with a pattern of black spots forming shown in fig. 784. The pattern is fairly constant, the anterior part of disc, its sides and slope always are maculate, but spots can be expand or reduced. Explanate margin with broad humeral, posterolateral, and sutural spots extending from the border of disc to

the lateral and apical margins of elytra. Humeral spots separated from the anterior margin of marginalia (fig. 784). Ventrites yellow with dark brown or black prosternal process, metathorax and central part of abdomen. Legs yellow. Antennae yellow, four last segments black, often segment 7 also more or less infuscate.



784-788. *Laccoptera depressa*: 784 - body in dorsal view, 785 - body in lateral view, 786 - head and prosternum, 787 - inner side of claw, 788 - antenna

Pronotum almost semicircular, 1.76-1.86 times wider than long, with maximum width at the base, sides rounded. Disc moderately convex. Surface of disc with impressions and a few grooves and wrinkles, does not appear rugose. Explanate margin distinctly wrinkled. The whole surface of disc glossy.

Elytral base only slightly wider than base of pronotum. Humeral angles blunt, rightangled, protrude anterad. Anterior margin of disc distinctly crenulate. Disc regularly convex, without tubercles and impressions, depressed at the top (fig. 785). Surface of elytra strongly sculptured. Puncturation coarse, spaces between punctures elevated, often form transverse folds between elevated longitudinal costae. Intervals elevated, intervals 3 and 5 project as distinct, elongate costae. Apex of elytral epipleura bare.

Clypeus broad, two times wider than long, convex, with two small angulation at the top. Labrum broad, emarginate to 1/6-1/5 length. Mandibles with distinct teeth. Prosternal process rhomboidal, narrow in the middle, with a distinct elongate impression (fig. 786).

Length ratio of antennal segments: 100: 39: 71: 75: 68: 61: 57: 57: 64: 121, segment 3 approximately 1.8 times longer than segment 2 and slightly shorter than segment 4 (fig. 788).

Claws with distinct inner pecten, with four teeth extending to half length of claw, outer pecten obsolete (fig. 787).

Aedeagus moderately broad, distinctly widened at 1/3 length, narrowed basally, constricted below apex. Apex broad, truncate, or shallowly emarginate. Apical part strongly curved ventrad. Ventral side without the membrane (figs 744, 745).

TYPE MATERIAL

Holotype: "India Bombay" (LB); 4 paratypes: "India Bombay" (3 ZMHU, 1 LB); paratype: "India Or." (LB).

DISTRIBUTION

India: Bombay.

Laccoptera (Sindia) sulcata (OLIVIER, 1808)

(figs 746, 747, 789-795, 802, tab. 14: 4, 5)

Cassida sulcata OLIVIER, 1808: 950; BOHEMAN, 1856: 116 (as syn. of *clathrata*).

Sindia sulcata: BOROWIEC, 1996: 42.

Laccoptera (Sindia) sulcata: BOROWIEC, 1999: 225.

Cassida clathrata FABRICIUS, 1798: 83, 1801: 396, nec LINNAEUS, 1758; HERBST, 1799: 303; SCHÖNHERR, 1817: 219; BOHEMAN, 1854: 330, 1856: 116, 1862: 283; GEMMINGER and HAROLD, 1876: 3648; ZIMSEN, 1964: 90.

Sindia clathrata: WEISE, 1897: 105; SPAETH, 1914 e: 81; MAULIK, 1919: 341 (incl. fig.), 1948: 368-371 (immature stages, incl. fig.); HINGSTON, 1928: 60-64 (bionomy, immature stages, incl. fig.); TAKIZAWA, 1985 a: 5 (photo); BOROWIEC, 1990 a: 706; BOROWIEC and TAKIZAWA, 1991: 639.

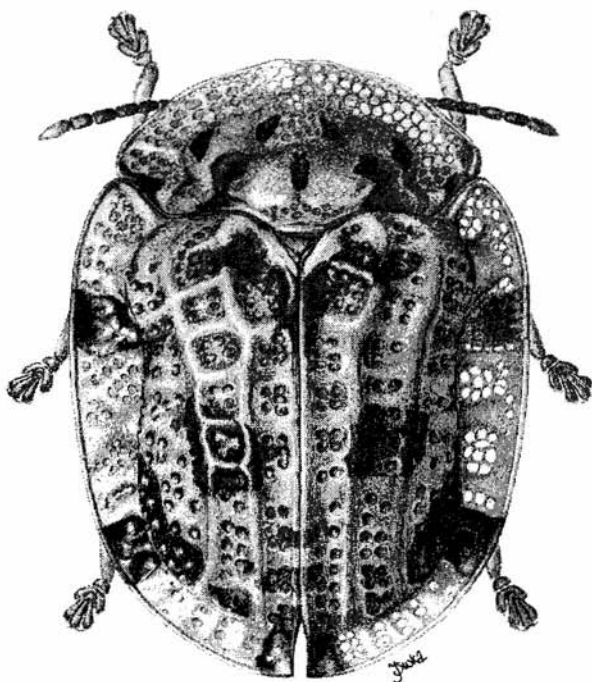
DIAGNOSIS

See diagnosis of *L. depressa*.

DESCRIPTION

L = 11.9-13.6; W = 8.2-9.6; Lp = 3.2-3.8; Wp = 6.8-7.8; L/W = 1.36-1.49; Wp/Lp = 1.92-2.15. Body oval, almost parallel-sided (fig. 789, 790). Sexual dimorphism barely marked, last antennal segment slightly longer in the male.

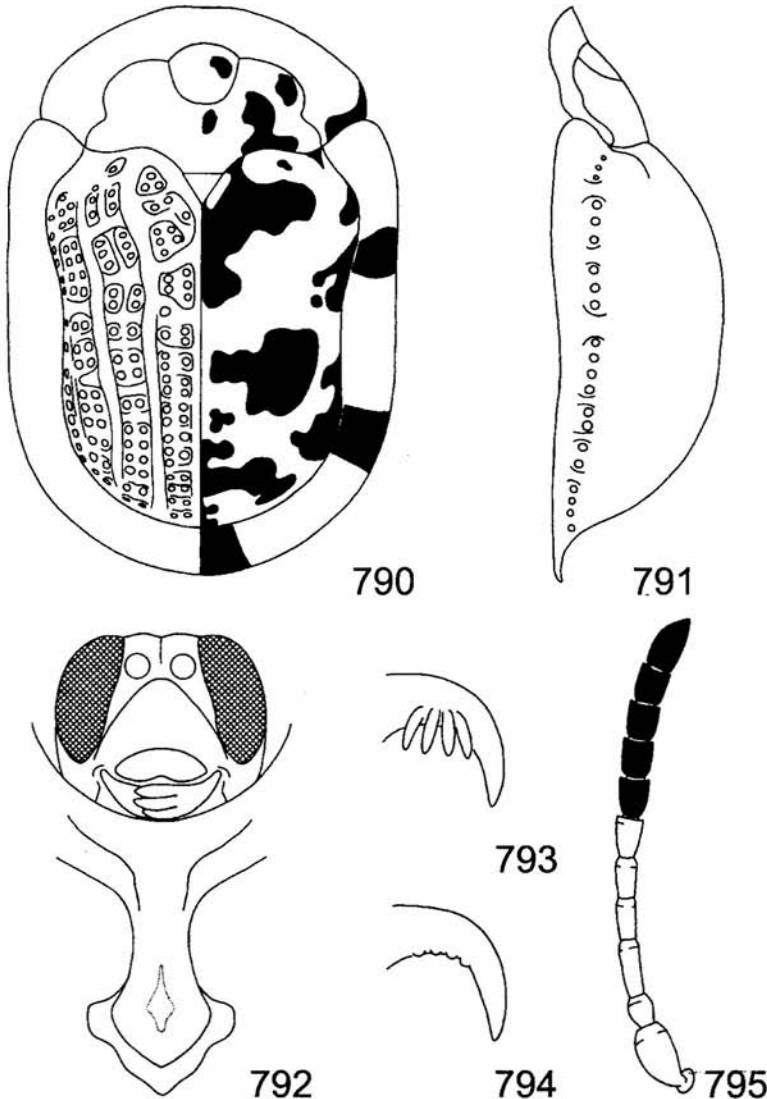
Pronotum yellow or yellowish-red with nine black spots: seven on the disc and two at the bases of explanate margin. Spots can be expand or reduced, the central spot of the disc being often, and the spots on the explanate margin occasionally obsolete. Scutellum yellow, yellowish-red or reddish-brown. Elytral disc reddish or yellowish-brown with a black pattern shown in figs 789 and 790. The pattern is fairly constant, sometimes spots can be expand or reduced, but anterior part of disc, sides, and slope always maculate. Explanate margin with moderately broad humeral, posterolateral, and sutural spots extending from the border of disc to the lateral and apical margins of elytra. Humeral spots separated from the anterior margin of marginalia (fig. 789, 790). Ventrites yellow with metathorax black except yellow lateral plates, and a black spot in the middle of abdomen, sometimes with an elongate blackish spot along the prosternal process. Legs yellow, femora usually with brown rings. Antennae yellow, five last segments black.



789. *Laccoptera sulcata*, habitus

Pronotum almost semicircular, 1.92-2.15 times wider than long, with maximum width at 1/3 basal length, in front of the base, sides rounded. Disc moderately convex. Surface of disc irregular, with impressions and few folds, does not appear rugose. Explanate margin distinctly wrinkled.

Elytral base slightly wider than base of pronotum. Humeral angles blunt, rightangled, protrude anterad. Anterior margin of disc distinctly crenulate. Disc regularly convex (fig. 791), without tubercles and impressions, slightly depressed



790-795. *Laccoptera sulcata*: 790 - body in dorsal view, 791 - body in lateral view, 792 - head and prosternum, 793 - inner side of claw, 794 - outer side of claw, 795 - antenna

at the top. Surface of elytra strongly sculptured. Puncturation very coarse, partly irregular. Spaces between punctures elevated, often form transverse folds. Intervals elevated, intervals 3 and 5 form distinct, elongate costae. Apex of elytral epipleura bare.

Clypeus approximately 1.8 times wider than long, convex with two small angulations at the top. Labrum broad, emarginate to 1/5 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately broad, with an elongate impression (fig. 792).

Length ratio of antennal segments: 100: 45: 80: 61: 61: 55: 51: 51: 51: 84, segment 3 approximately 1.8 times longer than segment 2 and approximately 1.3 times than segment 4 (fig. 795).

Claws with distinct inner pecten with four teeth extending to half length of claw (fig. 740). Outer pecten with four very small teeth, only slightly extending beyond the border of claw, sometimes outer pecten completely obsolete (fig. 794).

Aedeagus slim, only slightly widened at 1/3 length, strongly narrowed apically, with a rounded apical process. Apical part distinctly curved ventrad, but less than in *L. depressa*, apical process slightly bent dorsally in side view. Ventral side without the membrane (figs 746, 747).

TYPE MATERIAL

Cassida sulcata: type lost.

Cassida clathrata: 4 syntypes: "Ind. or." "396.45" (ZMK).

DISTRIBUTION

C and S India (fig. 802).

Subgenus: *Sindiola* SPAETH, 1903

Body usually subtriangular or subtrapezoidal, rarely almost parallel-sided. Elytra with a black pattern. Pronotum without distinct sculpture or smooth. Elytral base distinctly wider than base of pronotum. Pronotal sides rounded. Claws with distinct pecten on both margins (the only subgenus of *Laccoptera* with distinct outer pecten).

Seven species exclusively in the Oriental Region.

KEY TO SPECIES

1. Pronotum with 4 or 6 to 7 black spots. Body usually subtriangular or subtrapezoidal, occasionally parallel-sided, L/W usually below 1.32 (figs 796, 803, 827).
..... 2.

- Pronotum immaculate. Body parallel-sided, L/W above 1.33 (fig. 847).
..... *parallelipennis*
- 2. Pronotum with 6 or 7 black spots (figs 803, 827, 835, 854).
..... 3.
- Pronotum with 4 black spots (fig. 841).
..... *novemdecimnotata*
- 3. Ventriles uniformly yellow.
..... 4.
- Metathorax partly black.
..... 5.
- 4. Subhumeral spots of elytra elongate, oblique, reach only slightly beyond border of disc, no humeral spots on marginalia (fig. 803). At least four distal antennal segments infuscate to black. Only continental Asia.
..... *hospita*
- Subhumeral spots of elytra absent or very small, marginalia with black humeral spots reaching slightly beyond border of disc (fig. 835). At most three distal antennal segments infuscate to black. Only Java and adjacent islands.
..... *multinotata*
- 5. Body subtriangular to subtrapezoidal (figs 796, 854). Two small spots on apex of elytral disc close to suture (fig. 834).
..... 6.
- Body almost parallel-sided (fig. 827). One sutural spot on apex of elytral disc (fig. 833).
..... *meghalyaensis*
- 6. Postscutellar tubercle lower, elytra in lateral view only slightly concave behind the top of the tubercle (fig. 856). Praescutellar lobe of pronotum without black spot. Black spots of elytra smaller and occupy smaller part of elytra. Aedeagus very broad, with impression on ventral side, and sharply carinate sides (figs 821, 822).
..... *vigintisexnotata*
- Postscutellar tubercle higher, elytra in lateral view distinctly concave behind the top of the tubercle (fig. 797). Praescutellar lobe of pronotum with black spot. Black spots of elytra larger and occupy larger part of elytra. Aedeagus slim, without impression on ventral side, and carination of the sides (figs 819, 820).
..... *burmensis*

***Laccoptera (Sindiola) burmensis* (SPAETH, 1938)**

(figs 796-802, 819, 820, tab. 18: 1, 2)

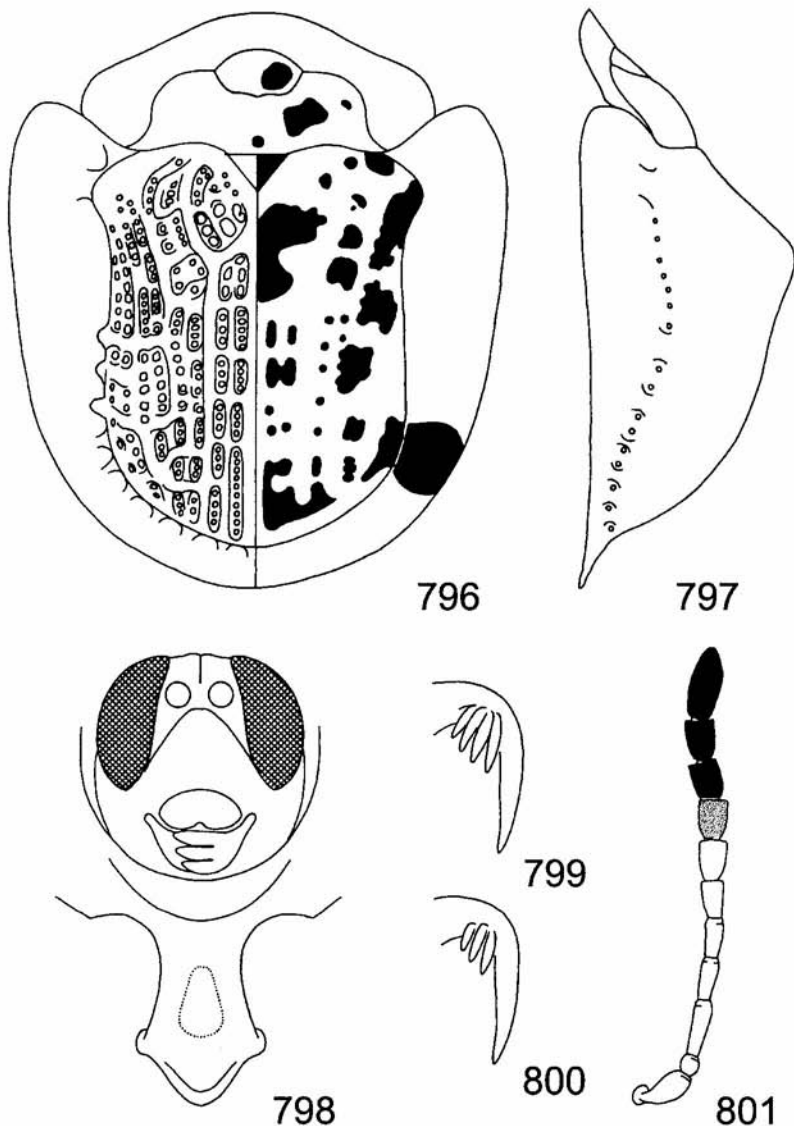
Sindiola vigintisex-notata ssp. *burmensis* SPAETH, 1938: 231.

Sindiola burmensis: CHEN et al., 1986: 569, 635, pl. XIII (incl. colour fig.); BOROWIEC, 1990 a: 706, 1996: 42; KIMOTO, 1998: 39.

Laccoptera (Sindiola) burmensis: BOROWIEC, 1999: 225.

DIAGNOSIS

L. burmensis is the largest species within the subgenus *Sindiola*, only *L. vigintisexnotata* is nearly as large. Both species have distinctly triangular body, at least six spots on pronotum, and partly black ventrites. *L. burmensis* differs from *L. vigintisexnotata* in the presence of black spot on praescutellar lobe of



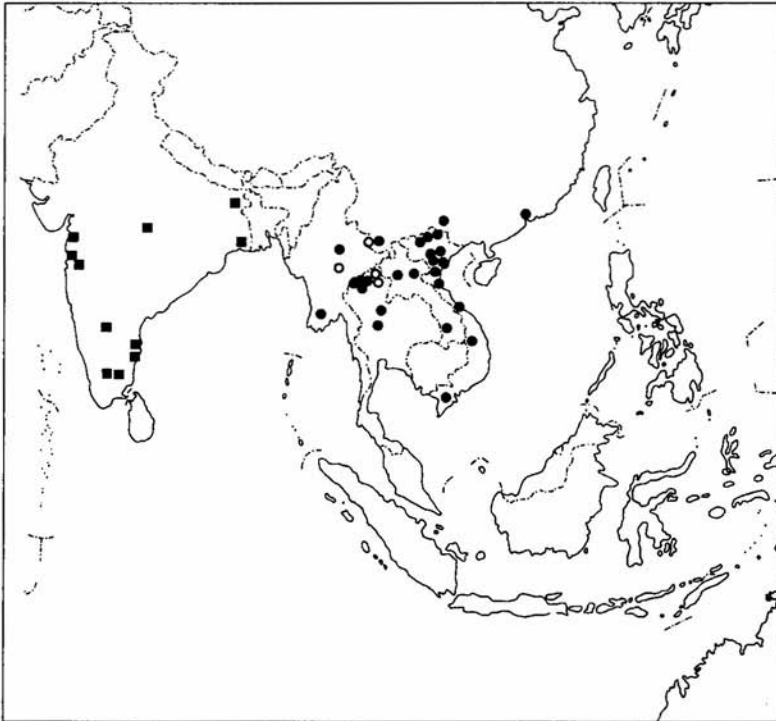
796-801. *Laccoptera burmensis*: 796 - body in dorsal view, 797 - body in lateral view, 798 - head and prosternum, 799 - inner side of claw, 800 - outer side of claw, 801 - antenna

pronotum. a higher postscutellar tubercle and more numerous dark spots on elytra, which occupy a relatively larger part of elytral disc than in *L. vigintisexnotata*. Aedeagus of *L. burmensis* is slim, without impression on ventral side, and carinae on the sides, while aedeagus of *L. vigintisexnotata* is broad, with impression on ventral side and carinae on the sides. *L. meghalayaensis* has also six to seven black spots on pronotum and partly black ventrites but distinctly differs in almost parallel-sided elytra.

DESCRIPTION

L = 10.1-11.4; W = 7.8-10.0; Lp = 2.8-2.9; Wp = 5.5-6.3; L/W = 1.14-1.29; Wp/Lp = 1.96-2.25. Body triangular (fig. 796). Antennae dimorphic, especially last segment distinctly longer in male.

Pronotum yellow with seven black spots on the disc: one small at the base of pronotum in front of scutellum and three on each side of disc. Scutellum yellow or black. Elytral disc yellow with numerous black spots forming the pattern shown in fig 796. The spots vary in number and size but spot in the postscutellar area, an oblique spot behind humeral callus (often divided into a series of small spots), and a spot on the slope always are present. Spots in the central part of disc are often reduced to



802. Distribution of *Lacoptera burmensis* (white circles), *L. hospita* (black circles) and *L. sulcata* (black squares)

areolae around punctures. Explanate margin with posterolateral spots and without humeral and sutural spots (fig. 796). Ventrites mostly black with yellow lateral plates of meso- and metathorax, yellow sides and bases of each abdominal sternite, and yellow plates surrounding coxae. Legs yellow. Antennae yellow, four or five terminal segments black.

Pronotum elliptical, 1.96-2.25 times wider than long, with maximum width at 1/3 basal length, sides rounded. Disc moderately convex, smooth and glossy. Surface of the explanate margin usually smooth, sometimes slightly irregular.

Elytral base distinctly wider than base of pronotum. Humeral angles protrude anterad, acuminate in some populations, especially in males. Disc irregularly convex, with a conical but obtuse postscutellar tubercle (fig. 797) and distinct postscutellar impressions. Surface of elytra distinctly sculptured. Puncturation coarse. Spaces between punctures elevated, some of them, especially between intervals 1 and 3 and in the anterior part of disc between intervals 3 and 5, and 5 and 7 form distinct transverse folds. Intervals 1, 3, 5, and 7 elevated, especially interval 3 high, forms an obtuse costa, especially in the anterior half of disc. Explanate margin with irregular shallow puncturation. Apex of elytral epipleura with short, sparse hairs.

Clypeus approximately 1.6 times wider than long, convex, with an obtuse angulation at the top. Labrum broad, emarginate to 1/5 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately broad, with an elongate impression (fig. 798).

Length ratio of antennal segments: 100: 33: 100: 79: 75: 71: 75: 75: 71: 71: 133, segment 3 approximately three times longer than segment 2 and approximately 1.27 times than segment 4 (fig. 801).

Claws with distinct pecten on both sides. Inner pecten with four teeth extending to 2/5 length of claw (fig. 799). Outer pecten with three teeth extending to 1/4 length of claw (fig. 800).

Aedeagus moderately broad, widest in the middle, narrowed both anteriorly and posteriorly. Sides not carinate. Apical plate elongate, truncate, not constricted in the middle, without an apical process. Apical part distinctly curved ventrad. Basal half of aedeagus in lateral view moderately swollen. Ventral side without the membrane (figs 819, 820).

TYPE MATERIAL

Lectotype: "S. Shan States Burma 1500 m, Taunggyi, 1.VIII-22.IX.34, Malaise" "26. notat. ab. SPAETH det." "*Sindiola burmensis* m. Typus SPAETH det." (NRS) – designated by BOROWIEC (1999); 2 paralectotypes: "S. Shan States" "Burma" "1500" "Taunggyi 1 VIII-22 IX 34" "Malaise" (BMNH); 2 paralectotypes: the same data ((MM).

DISTRIBUTION

Burma; China: Yunnan; Thailand (fig. 802).

***Laccoptera (Sindiola) hospita* BOHEMAN, 1855**

(figs 802-808, 823, 824, tab. 18: 3)

- Laccoptera hospita* BOHEMAN, 1855: 68, 1856: 155, 1862: 384; BALY, 1863: 14; GEMMINGER and HAROLD, 1876: 3662; BOROWIEC, 1985: 28; KIMOTO et al., 1995: 107 (in syn. of *vigintisexnotata*); HAITLINGER, 1996: 985 (parasite).
- Laccoptera (Laccoptera) hospita*: SPAETH, 1914 e: 82.
- Sindiola hospita*: SPAETH, 1932 b: 228, 1938: 232; GRESSITT, 1952: 470, 568 (incl. fig.); CHEN and ZIA, 1961: 441; GRESSITT and KIMOTO, 1963: 955 (incl. fig.); MEDVEDEV and DAN, 1982: 95; MEDVEDEV and EROSHKINA, 1982: 107; 1988: 123; LIZHONG, 1982: 53; YU, 1983: 794; ZAITSEV and MEDVEDEV, 1983: 131 (larva); CHEN et al., 1986: 570, 635; BOROWIEC, 1990 a: 706, 1996: 42; ZAITSEV, 1992: 177 (pupa); KIMOTO, 1998: 39.
- Sandiola* [sic!] *hospita*: LIZHONG, 1989: 87.
- Laccoptera (Sindiola) hospita*: BOROWIEC, 1999: 225.
- Laccoptera vigintisex-notata* var. *hospita*: MAULIK, 1918 b: 318 (incl. fig.).
- Sandiola* [sic!] *vigintisexnotata hospita*: LIZHONG, 1989: 87.
- Laccoptera vigintisexnotata* ssp. *puncticollis* GRESSITT, 1938 a: 189, 1938 c: 582, 1952: 470 (as syn. of *hospita*).
- Laccoptera vigintisexnotata puncticollis* [sic]: GRESSITT, 1939: 141.

DIAGNOSIS

L. hospita belongs to the group of species with a triangular or slightly trapezoidal body, six spots on pronotum, and completely yellow ventrites. The group also includes *L. multinotata*. *L. hospita* is slightly larger, its explanate margin of elytra is practically without humeral spots, and only elongate posthumeral spots of disc slightly extend beyond the border of disc, while in the *L. multinotata* explanate margin has distinct humeral spots and the posthumeral spots are short. Usually four, sometimes five last antennal segments are black in *L. hospita*, while usually only one or two last segments are infuscate in *L. multinotata*, which often has the antennae completely yellow. The two species are allopatric, *L. hospita* occurs in continental Asia, and *L. multinotata* is known only from Java and adjacent islands.

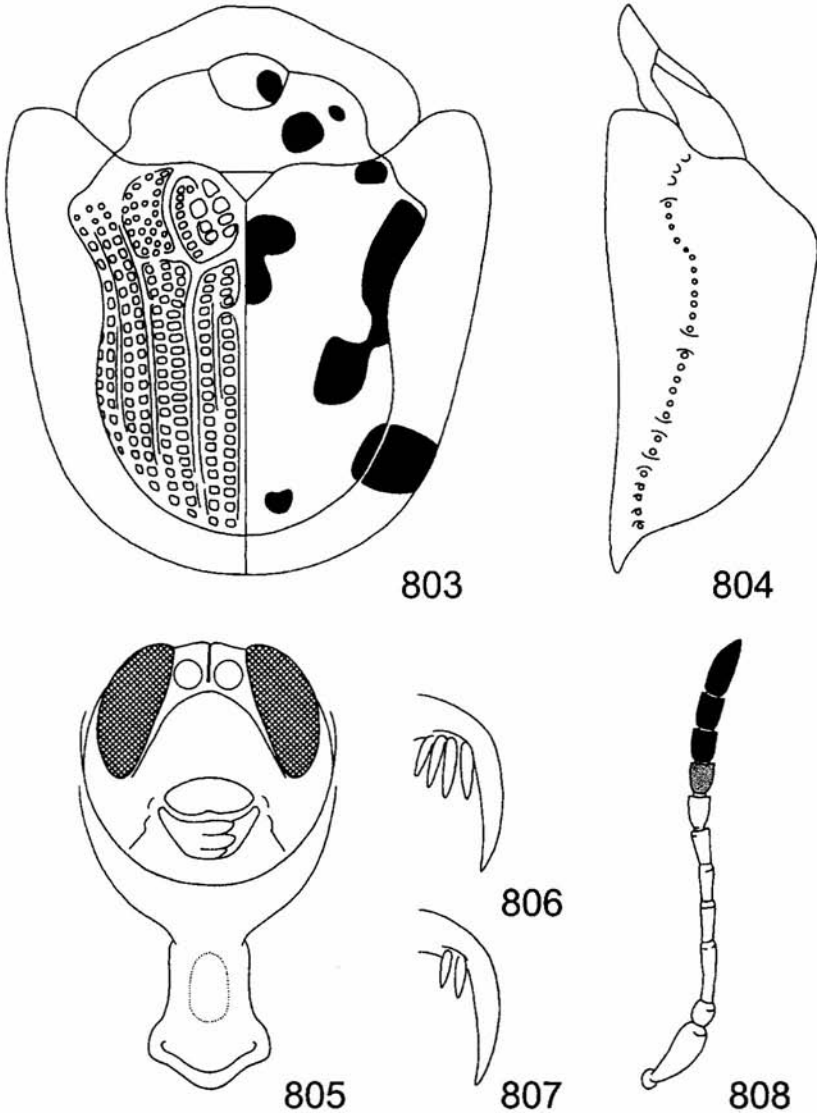
DESCRIPTION

L = 8.2-9.7; W = 6.5-8.0; Lp = 3.0-3.5; Wp = 4.8-5.8; L/W = 1.20-1.31; Wp/Lp = 1.57-1.67. Body triangular (fig. 803). Antennae dimorphic, especially last segment distinctly longer in the male.

Pronotum yellow or yellowish-brown with six spots: two largest, at the top of disc, two intermediate in the anterior part of disc (above the head), and two smallest, each on the side of disc. Scutellum yellow or yellowish-brown. Elytral disc yellow or yellowish-brown with a fairly constant pattern composed of a spot, sometimes divided into four smaller spots, in the postscutellar area on intervals 1-3, a spot (sometimes obsolete) between intervals 1 and 3 of half length of disc, a spot between intervals 1 and 4 on the slope, a spot, sometimes connected with elongate posthumeral spots, on intervals 5-7 at half length of disc, a spot on the humeral callus, and an elongate, oblique spot in the posthumeral part of disc, extending from the base of humeral callus to half length of disc. An additional small spot may be present between intervals 1 and 2 in the posterior part of the disc and 3-5 small spots in the anterior part of the disc. Explanate margin with posterolateral spots and without humeral and sutural spots (fig.

803), only posthumeral spots of disc slightly extend beyond the border of disc. Ventrites and legs uniformly yellow. Antennae yellow, four last segments black, often the seventh segment also infuscate or black or eighth segment paler than three last segments.

Pronotum elliptical, 1.57-1.67 times wider than long, with maximum width at half length, sides rounded. Disc moderately convex, usually glossy and smooth, in



803-808. *Laccoptera hospita*: 803 - body in dorsal view, 804 - body in lateral view, 805 - head and prosternum, 806 - inner side of claw, 807 - outer side of claw, 808 - antenna

some specimens slightly wrinkled or slightly roughly punctate. Explanate margin glossy and smooth.

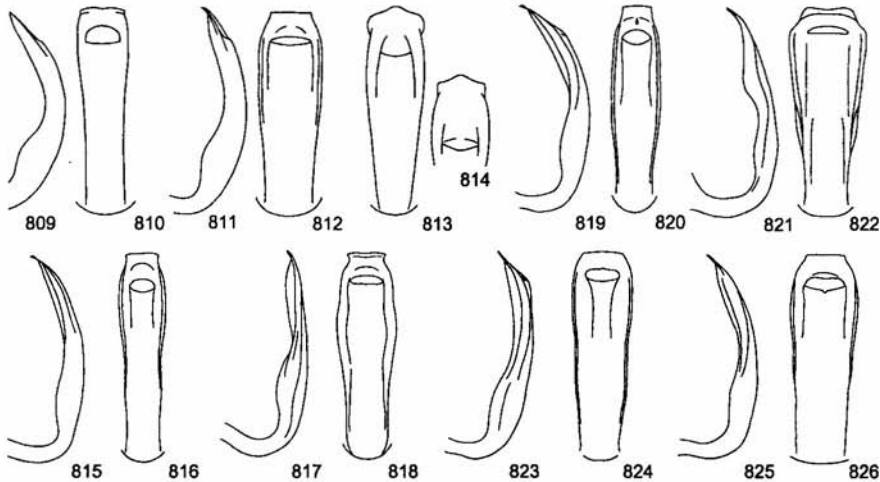
Elytral base distinctly wider than base of pronotum. Humeral angles acuminate, protrude anterad. Disc irregularly convex, slightly elevated in the postscutellar area, without a postscutellar tubercle, and with distinct postscutellar impressions (fig. 804). Surface of elytra strongly sculptured. Puncturation coarse, punctures almost touch each other, spaces between punctures elevated. Intervals narrower than punctures, elevated, interval 3 forms an obtuse costa. Explanate margin shallowly and densely punctate, surface appears irregular. Apex of elytral epipleura bare.

Clypeus approximately 1.5 times wider than long, convex, with an angulation at the top, and a more or less visible elongate impression in the middle. Labrum broad, emarginate to 1/4 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately broad, with a more or less visible impression (fig. 805).

Length ratio of antennal segments: 100: 29: 82: 53: 47: 44: 41: 38: 41: 41: 79, segment 3 approximately 2.8 times longer than segment 2 and approximately 1.55 times than segment 4 (fig. 808).

Claws with distinct pecten on both sides. Inner pecten with four teeth extending to 2/5 length of claw (fig. 806). Outer pecten with two teeth extending to 1/3 length of claw (fig. 807).

Aedeagus broad, slightly constricted in the middle, narrowed basally, not carinate on the sides, regularly rounded at the apex. Apical plate broadly truncate, without apical process, not constricted in the middle. Apical part gently curved ventrad, basal part of aedeagus in lateral view moderately swollen. Ventral side without the membrane (figs 823, 824).



809-826. Aedeagi: 809, 810 - *Laccoptera cheni*; 811, 812 - *L. meghalayaensis*; 813, 814 - *L. foveolata*; 815, 816 - *L. multinotata*; 817, 818 - *L. novemdecimnotata*; 819, 820 - *L. burmensis*; 821, 822 - *L. vigintisexnotata*; 823, 824 - *L. hospita*; 825, 826 - *L. parallelipennis*; 809, 811, 815, 817, 819, 821, 823, 825 - lateral; 810, 812-814, 816, 818, 820, 822, 824, 826 - dorsal

HOST PLANT

Convolvulaceae: Argyreia sp. (MEDVEDEV et DAN 1982).

TYPE MATERIAL

Laccoptera hospita: lectotype: "China" "Brit. Mus." "Type" (NRS) – designated by BOROWIEC (1999).

Laccoptera vigintisexnotata ssp. *puncticolle*: not examined.

DISTRIBUTION

S China: Guangdong, Guangxi, Hainan, Sichuan, Yunnan; Thailand; Vietnam (fig. 802).

***Laccoptera (Sindiola) meghalayaensis* n. sp.**

(figs 811, 812, 827-833, tab. 18: 6)

ETYMOLOGY

Named after its terra typica, the province Meghalaya in NE India.

DIAGNOSIS

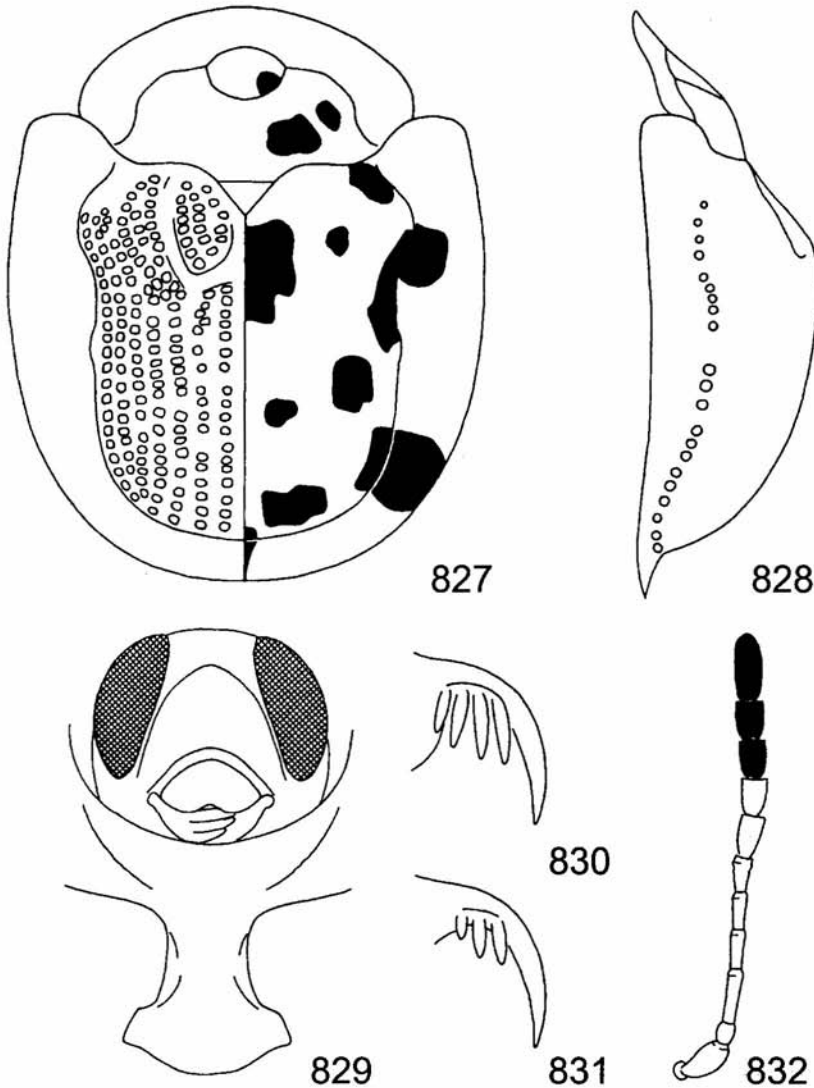
Black spotted metasternum and six pronotal spots as in *L. burmensis* and *L. vigintisexnotata*. However, the body in both species is subtriangular, and the body of *L. meghalayaensis* is almost parallel-sided. Postscutellar tubercle in *L. burmensis* is distinctly higher and elytral spots more numerous than in *L. meghalayaensis*. The new species also differs from *L. vigintisexnotata* in the presence of one sutural spot (fig. 833) on the apex of elytral disc (two small spots in *L. vigintisexnotata*, fig. 834). Aedeagus of *L. meghalayaensis* is more similar to that of *L. hospita* or *L. parallelipennis* than to that of *L. burmensis* and *L. vigintisexnotata*. *L. parallelipennis* is at first glance similar to *L. meghalayaensis* by its parallel-sided body, but differs in its immaculate pronotum and smaller size, with length below 9 mm (above 9.5 mm in *L. meghalayaensis*).

DESCRIPTION

Male: L = 9.9-10.5, W = 7.5-8.0, Lp = 3.5-3.8, Wp = 5.8-6.0, L/W = 1.26-1.31, Wp/Lp = 1.58-1.71; female: L = 10.4-11.2, W = 7.6-8.2, Lp = 3.6-3.9, Wp = 6.1-6.3, L/W = 1.34-1.37, Wp/Lp = 1.58-1.69. Body almost parallel-sided (fig. 827). Antennae dimorphic, especially last segment distinctly longer in male.

Pronotum yellow with six black spots: two big at the top of disc and four smaller (a pair on each side) close to the border of disc. Scutellum yellow. Elytral disc yellow with black spots in the postscutellar area on intervals 2 to 3 at 3/5 length of disc, in the posterior part of disc between intervals 2 and 4, in row 4 at 1/5 length of disc, between rows 4 and 7 at 3/5 length of disc, at the base of posterolateral spots of the explanate margin, and on the humeral callus. In the posthumeral area there is an elongate, oblique spot, extends from base of humeral callus to half length of disc. Explanate margin with humeral and posterolateral

spots and without the sutural spot. Humeral spots short, never extend to the extreme margin of marginalia, separated from the anterior margin of the explanate margin (fig. 827). Ventrites yellow with black metathorax, except yellow lateral plates, and with infuscate to dark brown prosternal process and spot in the middle of abdomen. Legs yellow, usually with a dark brown spot in the middle of femur. Antennae yellow, with two to five last segments infuscate to black, occasionally uniformly yellow.



827-832. *Laccoptera meghalayaensis*: 827 - body in dorsal view, 828 - body in lateral view, 829 - head and prosternum, 830 - inner side of claw, 831 - outer side of claw, 832 - antenna

Pronotum elliptical, 1.58-1.71 times wider than long, with maximum width at half length, sides rounded. Disc moderately convex, glossy and smooth. Explanate margin glossy and smooth.

Elytral base distinctly wider than base of pronotum. Humeral angles angulate, protrude anterad. Disc irregularly convex, slightly elevated in the postscutellar area, with distinct postscutellar impressions (fig. 828). Surface of elytra finely sculptured. Punctuation coarse, intervals 3 and 5 elevated in the anterior half of disc. Explanate margin with numerous shallow punctures. Apex of elytral epipleura with sparse hairs.

Clypeus approximately 1.6 times wider than long, convex, with a distinct angulation at the top and a more or less visible impression close to the top. Labrum broad, emarginate to 1/6 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately broad, slightly impressed in the middle (fig. 829).

Length ratio of antennal segments: 100: 37: 108: 75: 71: 66: 79: 66: 66: 66: 125, segment 3 approximately 2.8 times longer than segment 2 and approximately 1.4 times than segment 4 (fig. 832).

Claws with distinct pecten on both sides. Inner pecten with four teeth extending to half length of claw (fig. 830). Outer pecten with three teeth extending to 1/3 length of claw (fig. 831).

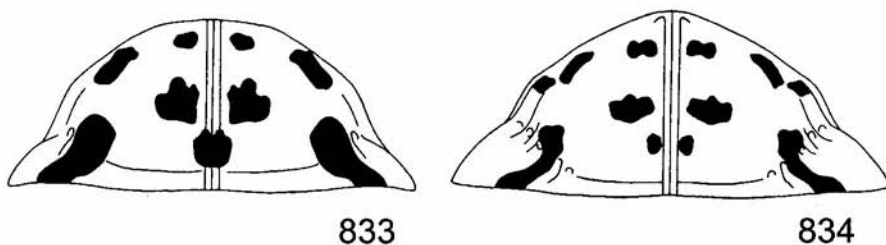
Aedeagus broad, slightly narrowed basally. Apex truncate, without apical process. Basal part in lateral view distinctly swollen. Apical part gently curved ventrad. Ventral side without the membrane. (figs 811, 812).

TYPE MATERIAL

Holotype: "India, Meghalaya, Tura to Willaimnagar road, IV 2000, Rahul Bahulikar" (LB); two paratypes: the same data; 4 paratypes: "NE INDIA: Meghalaya, 3 km E Tura, 500-1150 m, 25.30 N 90.14 E, 16-22 IV 1999, Rolčik J. leg."; paratype: "NE INDIA: Meghalaya, 3 km E Tura, 500-1150 m, 25.30 N 90.14 E, 22 IV 1999, lgt. J. Rolčik"; paratype: "NE India, Assam, 5 km N of Umrongso, 700 m, 25.27 N 92.43 E, 17-25 V 1999, J. Rolčik lgt. (paratypes in DS, FK, JB, LB, MS, PU).

DISTRIBUTION

India: Meghalaya, Assam (fig. 853).



833, 834. Pattern on slope: 833 - *Laccoptera meghalayaensis*, 834 - *Laccoptera vigintisexnotata*.

***Laccoptera (Sindiola) multinotata* BOHEMAN, 1855**

(figs 815, 816, 835-840, 871, tab. 18: 8)

Laccoptera multinotata BOHEMAN, 1855: 70; 1856: 155; 1862: 384; GEMMINGER and HAROLD, 1876: 3662.*Laccoptera (Laccoptera) multinotata*: SPAETH, 1914 e: 82.*Sindiola multinotata*: SPAETH, 1932 b: 228, 1938: 232; BOROWIEC, 1990 a: 707.*Laccoptera vigintisex-notata* var. *multinotata*: MAULIK, 1918 b: 318.*Laccoptera (Sindiola) multinotata*: BOROWIEC, 1999: 226.*Sindiola vigintisexnotata*: KIMOTO et al., 1995: 107 (incl. photo, misidentification).

DIAGNOSIS

L. multinotata belongs to the group of species with a triangular or slightly trapezoidal body, six spots on pronotum, and completely yellow ventrites. The group also includes *L. hospita*. *L. multinotata* is slightly smaller than *L. hospita*, and has distinct humeral spots on the explanate margin of elytra, (none on the explanate margin of *L. hospita*). Antennae of *L. multinotata* are completely yellow or at most one or two last segments are infuscate, while *L. hospita* has four or sometimes five last antennal segments black. The two species are allopatric, *L. multinotata* is known only from Java and adjacent islands and *L. hospita* is distributed in continental Asia.

DESCRIPTION

L = 8.5-9.2; W = 6.9-7.5; Lp = 3.1-3.3; Wp = 4.9-5.2; L/W = 1.18-1.29; Wp/Lp = 1.56-1.62. Body trapezoidal (fig. 835). Antennae dimorphic, especially last segment distinctly longer in male.

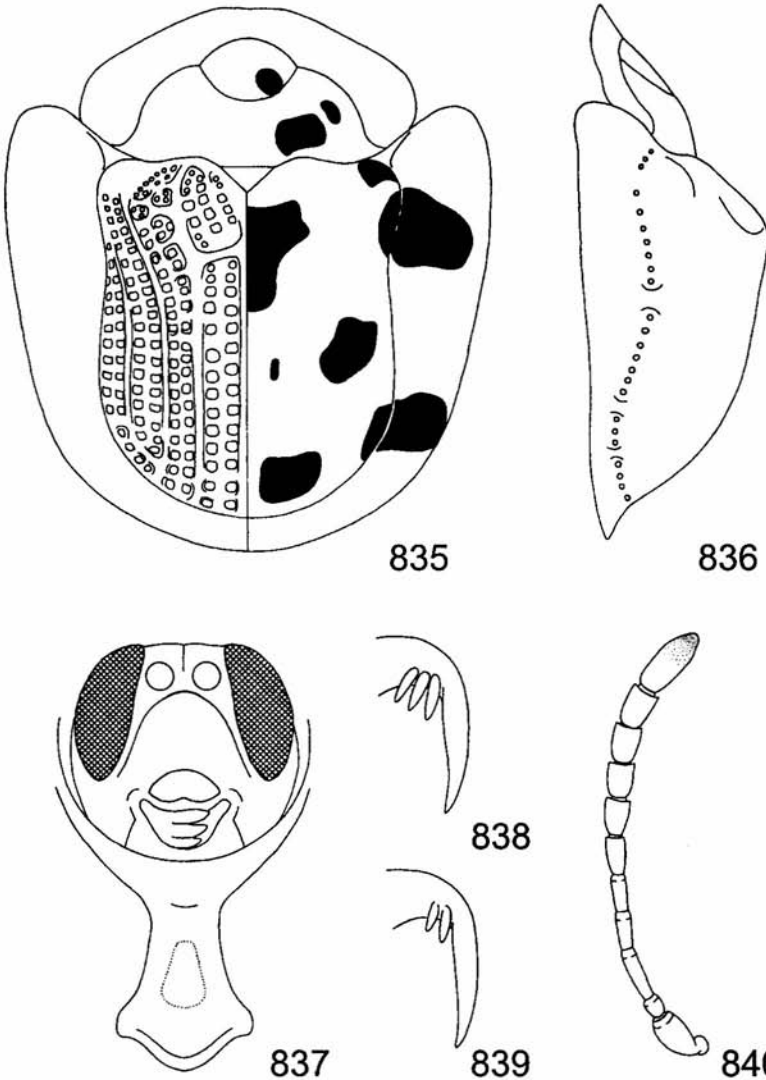
Pronotum yellowish-brown with six black spots: two big at the top of disc, two medium-sized above the head, and one small on each side of the disc. Scutellum yellowish-brown. Elytral disc yellowish-brown with black spots in the postscutellar area on intervals 1-2, on intervals 2-4 at 3/4 length of disc, on intervals 5-7 at 2/5 length of disc, on the humeral callus, and two on each side of the disc, one at the base of humeral spots another at the base of posterolateral spots. Small spot often occurs on interval 2 at half length of disc. Explanate margin with humeral and posterolateral spots and without the sutural spot (fig. 835). Ventrites and legs uniformly yellow. Antennae yellow, one or two last segments infuscate or black.

Pronotum ellyptical, 1.56-1.62 times wider than long, with maximum width in basal 1/3 length, sides rounded. Disc moderately convex, glossy and smooth. Explanate margin glossy and smooth.

Elytral base distinctly wider than base of pronotum. Humeral angles rounded, protrude anterad. Disc irregularly convex, slightly elevated in the postscutellar area, without the postscutellar tubercle (fig. 836) and with distinct postscutellar impressions. Surface of elytra strongly sculptured. Puncturation coarse, punctures almost touch each other, spaces between punctures elevated. Intervals elevated, interval 3 in the anterior part and at the top of disc forms an obtuse costa. Explanate margin with shallow, coarse punctures. Apex of elytral epipleura bare.

Clypeus approximately 1.6 times wider than long, convex, angulation at the top with a more or less marked impression. Labrum broad, emarginate to 1/6 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately broad, with an elongate impression (fig. 837).

Length ratio of antennal segments: 100: 34: 96: 65: 65: 65: 61: 61: 61: 69: 127, segment 3 approximately 2.8 times longer than segment 2 and approximately 1.5 times than segment 4 (fig. 840).



835-840. *Laccoptera multinotata*: 835 - body in dorsal view, 836 - body in lateral view, 837 - head and prosternum, 838 - inner side of claw, 839 - outer side of claw, 840 - antenna

Claws with pecten on both sides. Inner pecten with three teeth extending to 3/4 length of claw (fig. 838). Outer pecten with two teeth extending to 1/4 length of claw (fig. 839).

Aedeagus moderately broad, slightly constricted in the middle. Apical plate truncate, without the apical process, slightly constricted in the middle. Apical part gently curved ventrad. Basal part of aedeagus in lateral view moderately swollen. Ventral side without the membrane (figs 815, 816).

TYPE MATERIAL

Holotype: "Java" "Westerm." "Type" (NRS).

DISTRIBUTION

Indonesia: Java and adjacent islands (fig. 871).

Laccoptera (Sindiola) novemdecimnotata BOHEMAN, 1855

(figs 817, 818, 841-846, 853, tab. 18: 9)

Laccoptera novemdecimnotata BOHEMAN, 1855: 67; 1856: 155; 1862: 384; BALY, 1863: 14; GEMMINGER and HAROLD, 1876: 3662; WEISE, 1897: 104 (*19-notata*); KIMOTO et al., 1995: 107 (in syn. of *vigintisexnotata*).

Laccoptera (Laccoptera) novemdecim-notata: SPAETH, 1914 e: 82.

Sindiola 19-notata: SPAETH, 1932 b: 227, 1938: 232.

Sindiola novemdecimnotata: BOROWIEC, 1990 a: 707.

Laccoptera vigintisex-notata var. *novemdecimnotata*: MAULIK, 1918 b: 318 (incl. fig.).

Laccoptera (Sindiola) novemdecimnotata: BOROWIEC, 1999: 226.

Laccoptera quadraria CHEVROL.: GEMMINGER and HAROLD, 1876: 3662 (nomen nudum).

DIAGNOSIS

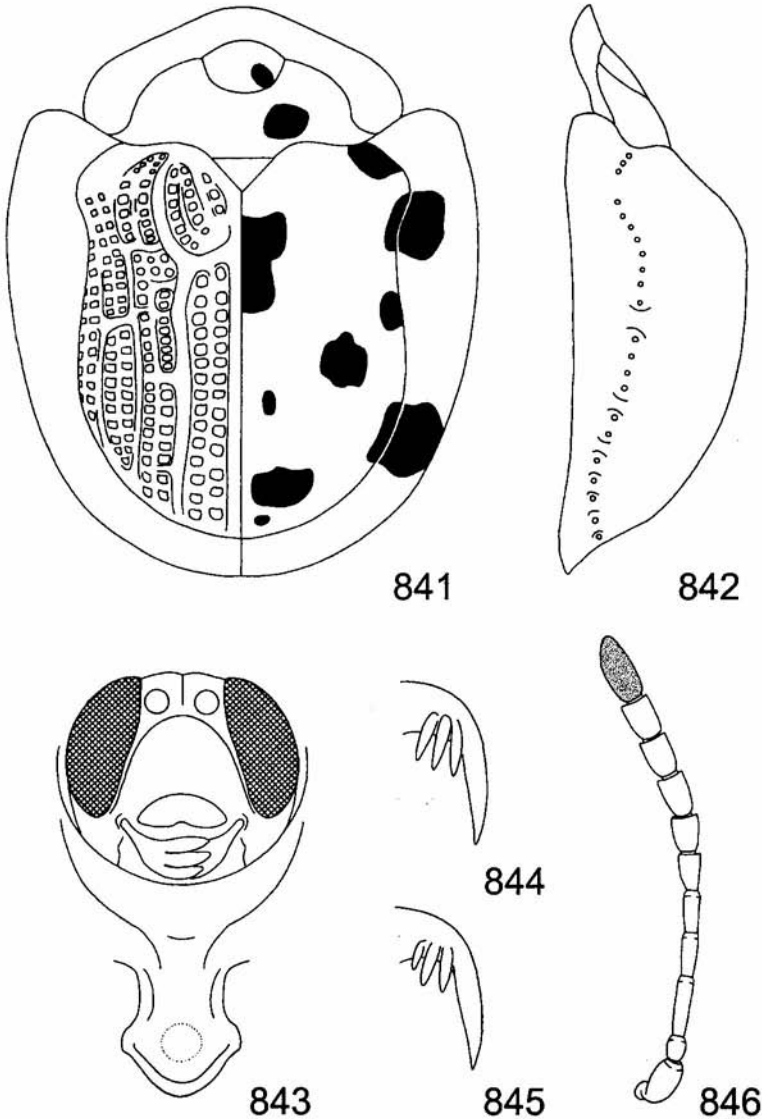
The only species of the subgenus *Sindiola* with four spots on pronotum. *L. novemdecimnotata* is the most similar to *L. multinotata*, especially in body shape and colouration of antennae, which are yellow with at most one to three last segments infuscate. Both species are sympatric in Java. *L. mutilata* differs in presence of six spots on pronotum and completely yellow ventrites, while *L. novemdecimnotata* has black spots on metathorax.

DESCRIPTION

L = 9.5-10.4; W = 7.2-8.2; Lp = 3.2-3.4; Wp = 5.0-5.7; L/W = 1.24-1.31; Wp/Lp = 1.56-1.67. Body trapezial (fig. 841). Antennae dimorphic, especially last segment distinctly longer in male.

Pronotum yellowish-brown with four black spots: two large at the top of disc and two smaller above the head. Scutellum yellowish-brown. Elytral disc yellowish-brown with black spots, one in the postscutellar area on intervals 1-2, one on intervals 2-3 at 2/5 length of disc, one on intervals 2-4 at 4/5 length of disc, one on interval 2 in the posterior part of disc, one on humeral callus, an elongate one on intervals 5-7 at 2/3 length of disc, and three on side of disc, one at the base of humeral callus, one at 1/3 and one at 2/3 length of disc. The spot at the base of

humeral callus connects with the humeral spots on the explanate margin, the spot at $2/3$ length connects with the posterolateral spots on the explanate margin. Explanate margin with both humeral and posterolateral spots, but without a sutural spot. Humeral spots never extend to the extreme margin of explanate margin, far from the anterior margin of marginalia. Posterolateral spots extend from the border of disc to the extreme margin of explanate margin (fig. 841).



841-846. *Laccoptera novemdecimnotata*: 841 - body in dorsal view, 842 - body in lateral view, 843 - head and prothorax, 844 - inner side of claw, 845 - outer side of claw, 846 - antenna

Ventrites mostly yellow, only metathorax mostly black except for yellow lateral plates. Legs yellow. Antennae yellow, one or two, occasionally three last segments infusate or black.

Pronotum elliptical, 1.56-1.67 times wider than long, with maximum width in basal 1/3 length, sides rounded. Disc moderately convex, glossy and smooth. Explanate margin glossy and smooth.

Elytral base distinctly wider than base of pronotum. Humeral angles rounded, protrude anterad. Disc almost regularly convex, slightly elevated in the postscutellar area, without the postscutellar tubercle (fig. 842), but with distinct postscutellar impressions. Surface of elytra strongly sculptured. Puncturation coarse, punctures almost touch each other. Spaces between punctures and intervals elevated, interval 3 forms an obtuse costa. Explanate margin with shallow, coarse punctures. Apex of elytral epipleura bare.

Clypeus approximately 1.6 times wider than long, convex, angulation at the top with a more or less visible impression. Labrum broad, emarginate to 1/5 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately broad, with a shallow impression (fig. 843).

Length ratio of antennal segments: 100: 50: 123: 90: 86: 73: 73: 82: 77: 82: 140, segment 3 approximately 2.5 times longer than segment 2 and approximately 1.4 times than segment 4 (fig. 846).

Claws with distinct pecten on both sides. Inner pecten with three teeth extending to 1/2-2/3 length of claw (fig. 844). Outer pecten with three teeth extending to 1/3-1/2 length of claw (fig. 845).

Aedeagus broad, slightly widened in the middle. Apical plate truncate, without the apical process, deeply constricted in the middle. Apical part only slightly curved ventrad. Basal part of aedeagus in lateral view strongly swollen. Ventral side without the membrane (figs 817, 818).

TYPE MATERIAL

Lectotype: "Jawa" "Type" (NRS) – designated by BOROWIEC (1999); paralectotype: "Jawa" "coll. Dejean" "quadraria Chevrolat" "Deloyala 19-notata Buquet h. Jawa D. Buquet" (HU); 3 paralectotypes: "Mus. Wetsrm." "Java Mai 1814 19= notata Buquet" (ZMK); paralectotype: "Assam" "Westerman" (NRS). Paralectotype from Assam belongs to *L. vigintisexnotata* BOH.

DISTRIBUTION

Indonesia: Java, Sumatra; Malaysia continental: Perak (fig. 853).

Laccoptera (Sindiola) parallelipennis (SPAETH, 1903)

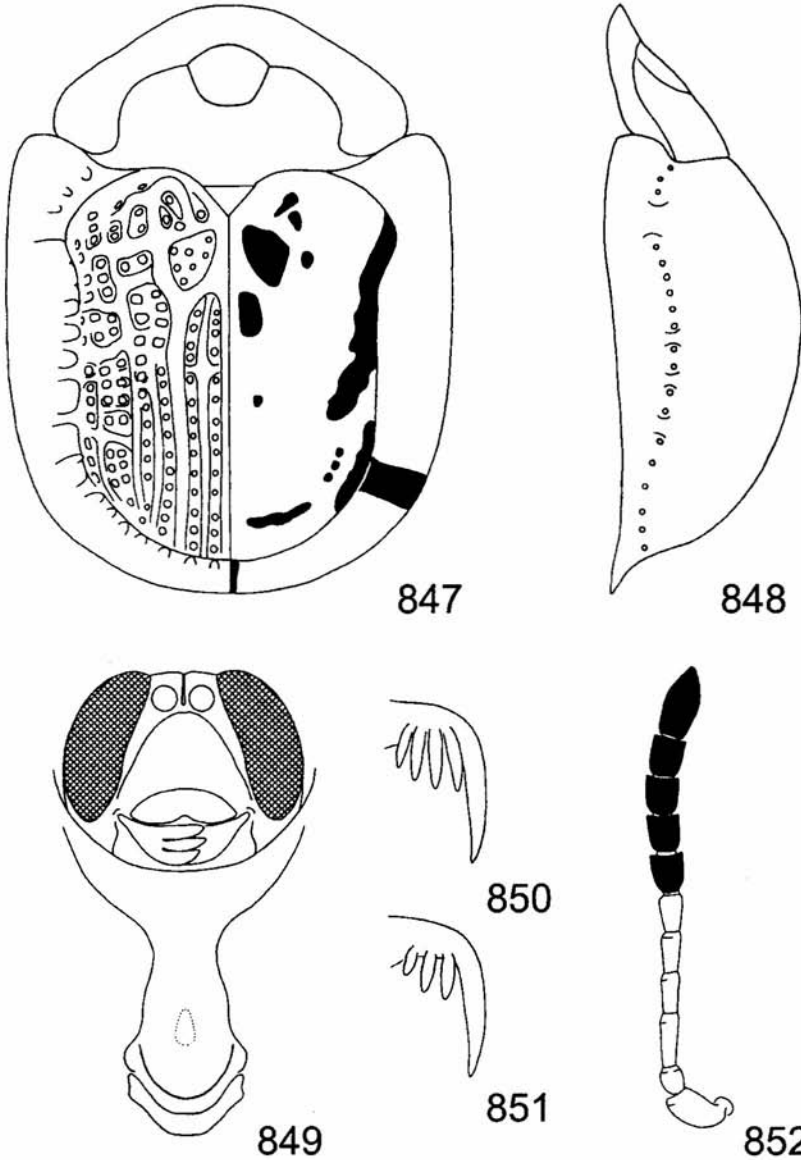
(figs 825, 826, 847, 853, tab. 18: 7)

Sindiola (Aspidomorpha) parallelipennis SPAETH, 1903 b: 111, 1914 c: 81; MAULIK, 1919: 345 (incl. fig.).

Laccoptera (Sindiola) parallelipennis: BOROWIEC, 1999: 226.

DIAGNOSIS

Laccoptera parallelipennis differs from other species of subgenus *Sindiola* in pronotum without distinct spots and parallel-sided body. Only *L. mehghalayaensis* has body almost parallel-sided but distinctly differs in maculate pronotum and larger size, with length above 9.5 mm (below 9.0 mm in *L. parallelipennis*).



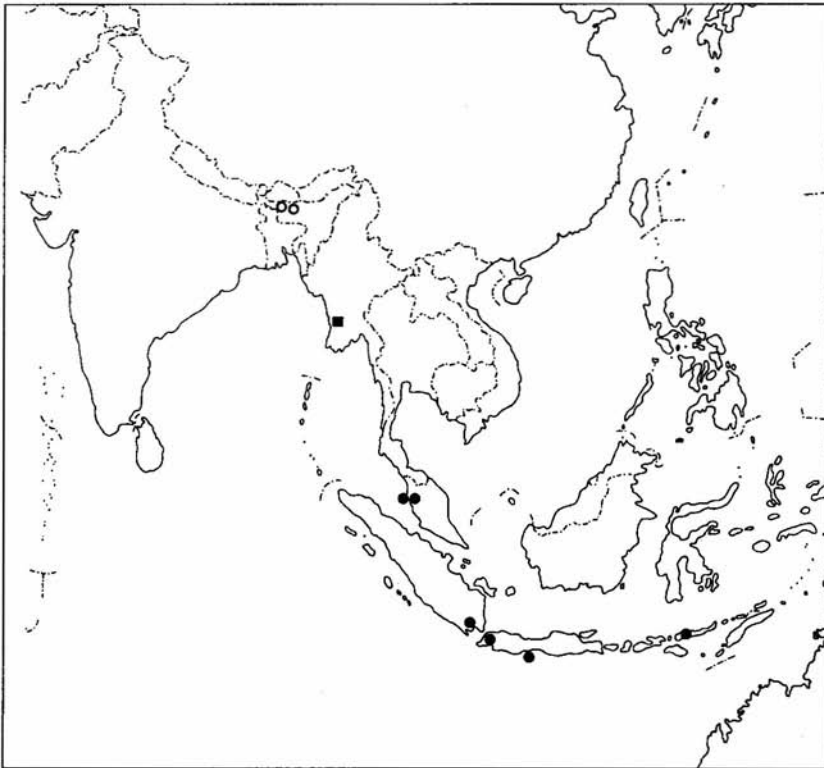
847-852. *Laccoptera parallelipennis*: 847 - body in dorsal view, 848 - body in lateral view, 849 - head and prosternum, 850 - inner side of claw, 851 - outer side of claw, 852 - antenna

DESCRIPTION

L = 8.4-9.0; W = 6.1-6.4; Lp = 3.0-3.2; Wp = 4.9-5.0; L/W = 1.34-1.41; Wp/Lp = 1.56-1.67. Body oval, almost parallel-sided (fig. 847). Antennae dimorphic, especially last segment distinctly longer in male.

Pronotum and scutellum yellowish to reddish-brown, without spots. Elytral disc yellowish to reddish-brown with black spots: between intervals 2 and 3 at the base of disc, one in the postscutellar area between intervals 1 and 3, one between intervals 1 and 3 at 1/3 length of disc, a small one on interval 2 at half length of disc, one on intervals 2-4 in the posterior part of disc, and two on the sides of disc, an elongate one extending from the base of humeral callus to 2/3 length of disc and another one at the base of the posterolateral spots on explanate margin. Explanate margin with black posterolateral and sutural spots, but without humeral spots (fig. 847). Ventrites yellow. Legs yellowish-brown. Antennae yellowish-brown, five last segments black.

Pronotum elliptical, 1.56-1.63 times wider than long, with strongly rounded anterior margin, with maximum width of pronotum at 1/3 basal length, sides rounded. Disc moderately convex, glossy and smooth. Explanate margin glossy and smooth.



853. Distribution of *Laccoptera meghalayaensis* (white circles) *L. parallelipennis* (black squares) and *L. novemdecimnotata* (black circles)

Elytral base moderately wider than base of pronotum. Humeral angles rounded, protrude anterad. Disc regularly convex, without the postscutellar tubercle (fig. 848), but with distinct postscutellar impressions. Surface of elytra strongly sculptured. Puncturation coarse, punctures almost touch each other. Spaces between punctures elevated, intervals strongly elevated, interval 3 and the anterior part interval 5 form obtuse costae. Explanate margin with shallow, coarse punctures. Apex of elytral epipleura bare.

Clypeus approximately 1.6 times wider than long, convex, with an angulation at the top and a circular impression below the top. Labrum broad, emarginate to 1/6 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately broad, with a small impression (fig. 849).

Length ratio of antennal segments: 100: 46: 84: 69: 69: 61: 57: 57: 57: 61: 123, segment 3 approximately 1.8 times longer than segment 2 and approximately 1.2 times than segment 4 (fig. 852).

Claws with distinct pecten on both sides. Inner pecten with four teeth extending to half length of claw (fig. 850). Outer pecten with three teeth extending to 1/3 length of claw (fig. 851).

Aedeagus broad, slightly narrowed basally. Apical plate truncate, without the apical process, not constricted in the middle. Apical part curved ventrad. Basal part of aedeagus in lateral view only slightly swollen. Ventral side without the membrane (figs 825, 826).

TYPE MATERIAL

Holotype: "Birma" "Tarnier" "Aspidomorpha parallelipennis det. SPAETH typ! n. sp." (NRS).

DISTRIBUTION

Burma (fig. 853).

Laccoptera (Sindiola) vigintisexnotata BOHEMAN, 1855

(figs 821, 822, 834, 854-863, tab. 18: 4, 5)

Laccoptera vigintisexnotata BOHEMAN, 1855: 66, 1856: 155, 1862: 384; MAULIK, 1918 b: 318 (*vigintisexnotata*, incl. fig.), 1919: 352 (fig.); BOROWIEC, 1985: 29; MOHAMEDSAID, 2000 a: 359.

Laccoptera vigintinotata [sic!]: BALY, 1863: 14.

Laccoptera vigintisexnotata vigintisexnotata: GRESSITT, 1938c: 582.

Laccoptera (Laccoptera) novemdecim-notata var. *vigintisex-notata*: SPAETH, 1914 e: 82.

Sindiola vigintisexnotata: SPAETH, 1938: 232 (*26-notata*); CHEN and ZIA, 1961: 441; MEDVEDEV and DAN, 1982: 95; MEDVEDEV and EROSHKINA, 1982: 107; 1988: 123; YU, 1983: 794; ZAITSEV and MEDVEDEV, 1983: 136 (larva); CHEN et al., 1986: 571, 635, pl. XIII (incl. colour fig.); BOROWIEC, 1990 a: 707, 1996: 43; KIMOTO, 1998: 39 (incl. colour photo).

Laccoptera (Sindiola) vigintisexnotata: BOROWIEC, 1999: 226.

DIAGNOSIS

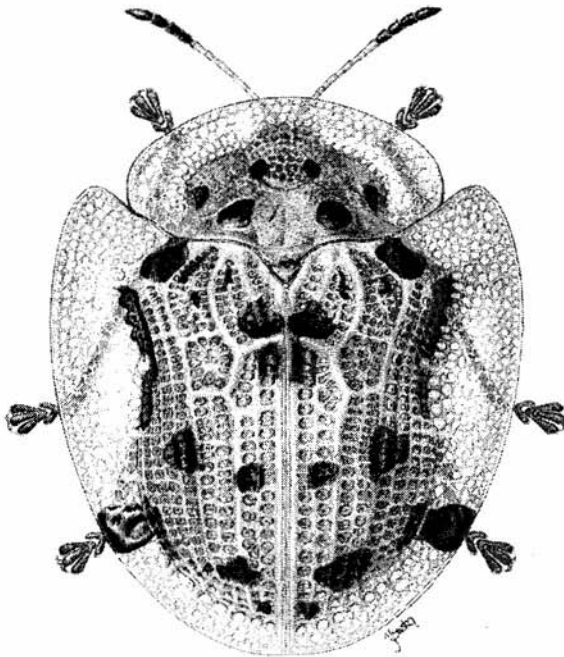
Black spotted metasternum and six pronotal spots similar as in *L. burmensis* and *L. meghalayaensis*. *L. burmensis* species differs in the presence of a higher.

postscutellar tubercle, more developed black elytral pattern, and black spot on the prescutellar lobe of pronotum (no spot on the prescutellar lobe in *L. vigintisexnotata*). *L. meghalayaensis* has the elytral pattern at first glance similar to that of *L. vigintisexnotata*, but differs in the presence of common sutural spot on the apex of elytral disc (two small spots close to suture in *L. vigintisexnotata*) and almost parallel-sided body (subtriangular in *L. vigintisexnotata*). *L. vigintisexnotata* has the stoutest aedeagus in the subgenus *Sindiola*, with characteristic lateral carinae.

DESCRIPTION

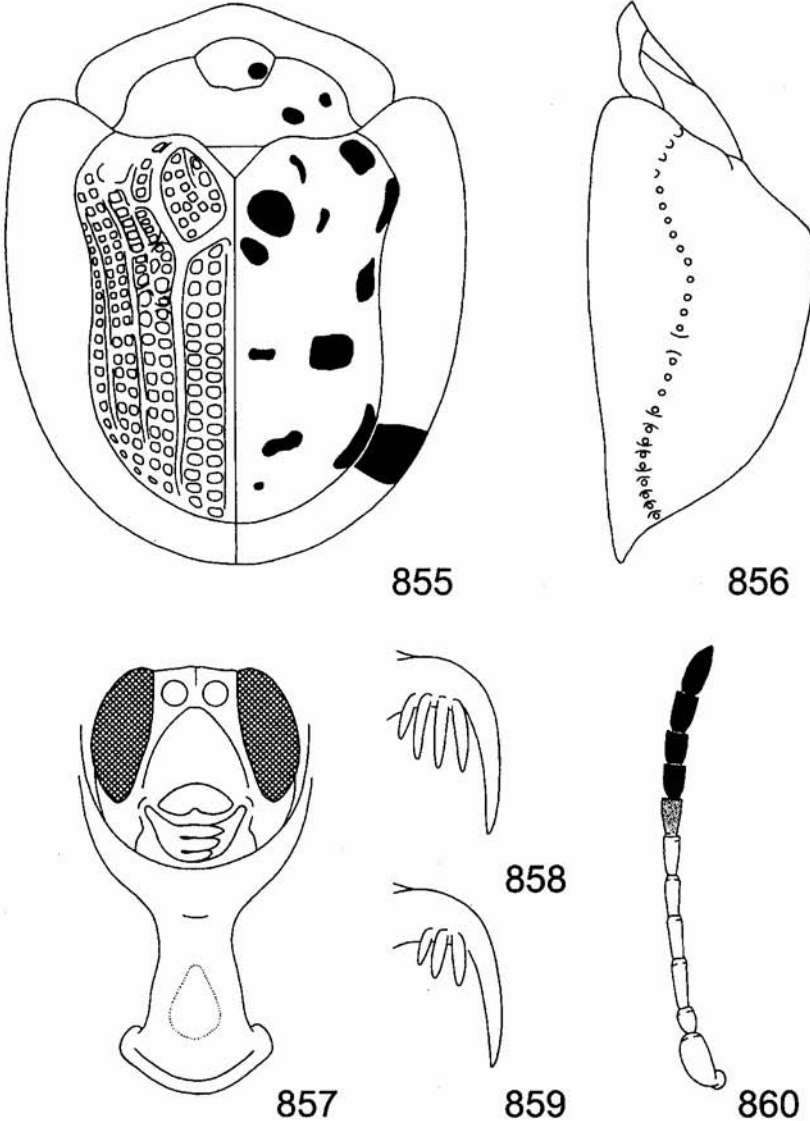
L = 9.6-11.3; W = 7.7-9.8; Lp = 2.8-4.0; Wp = 5.3-6.6; L/W = 1.11-1.24; Wp/Lp = 1.58-2.06. Body triangular (fig. 54, 855). Antennae dimorphic, especially last segment distinctly longer in male.

Pronotum yellowish-brown with six black spots: two large at the top of disc, two smaller above the head, and two small, one on each side of the disc. The side spots sometimes obsolete. Specimens with reduced spots on sides of disc are similar to *L. novemdecimnotata*, however *L. vigintisexnotata* always differs in a more triangular body and at least four dark antennal segments (at most three in *L. novemdecimnotata*). Scutellum yellowish-brown. Elytral disc yellowish-brown with black spots: one (often divided into four small spots) in the postscutellar area, one on interval 2 at half length of disc, one in the posterior part of disc between intervals 1 and 5, one at half length of disc between intervals 5 and 7, one on the humeral callus, one elongate spot or a group



854. *Laccoptera vigintisexnotata*, habitus

of small spots extending from base of humeral callus to half length of disc, and one at the base of posterolateral spots on explanate margin. Additional small often occur spots in the anterior part of disc and one spot on the slope, but the elytra never look as much spotted as in *L. burmensis*. Explanate margin with complete posterolateral spots and without the sutural spot. Humeral spots usually absent (fig. 861), or short, extending at most to 1/3 width of marginalia (fig. 862). Ventriles usually black except



855-860. *Laccoptera vigintisexnotata*: 855 - body in dorsal view, 856 - body in lateral view, 857 - head and prosternum, 858 - inner side of claw, 859 - outer side of claw, 860 - antenna

for yellow lateral plates and yellow margins of abdomen, occasionally only metasternum mostly black. Legs yellow. Antennae yellow, usually five, rarely four last segments black.

Pronotum elliptical, 1.58-2.06 times wider than long, with maximum width of pronotum at half length, sides rounded. Disc moderately convex, glossy and shiny. Explanate margin glossy and shiny.

Elytral base distinctly wider than base of pronotum. Humeral angles angulate, protrude anterad. Disc irregularly convex, slightly elevated in the postscutellar area, with barely marked, blunt postscutellar tubercle and distinct postscutellar impressions (fig. 856). Surface of elytra strongly sculptured. Puncturation coarse, spaces between punctures elevated and intervals 1, 3, 5, and 7 elevated. Intervals 3 and 5 form obtuse costae in the anterior part and so does interval 3 at the top of disc. Explanate margin with numerous shallow punctures. Apex of elytral epipleura with sparse hairs.

Clypeus approximately 1.8 times wider than long, convex, with a distinct angulation at the top and a more or less visible impression below the top. Labrum broad, emarginate to 1/5 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately broad, with a distinct, impression (fig. 857).

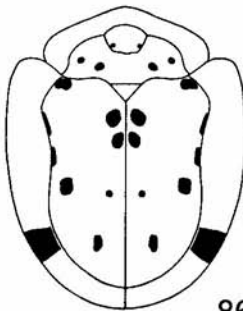
Length ratio of antennal segments: 100: 41: 81: 74: 66: 63: 59: 55: 55: 63: 89, segment 3 approximately two times longer than segment 2 and approximately 1.1 times than segment 4 (fig. 860).

Claws with a distinct pecten on both sides. Inner pecten with four teeth extending to 2/3 length of claw (fig. 858). Outer pecten with three teeth extending to 1/3 length of claw (fig. 859).

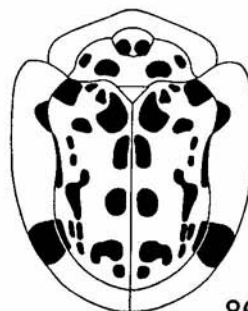
Aedeagus very broad, strongly narrowed basally, carinate laterally. Apical plate shallowly emarginate, without the apical process, not constricted in the middle. Apical part gently curved ventrad. Basal part of aedeagus in lateral view only slightly swollen. Ventral side without the membrane but deeply impressed (figs 821, 822).

HOST PLANT

Convolvulaceae: Argyreia sp. (MEDVEDEV et DAN 1982).



861



862

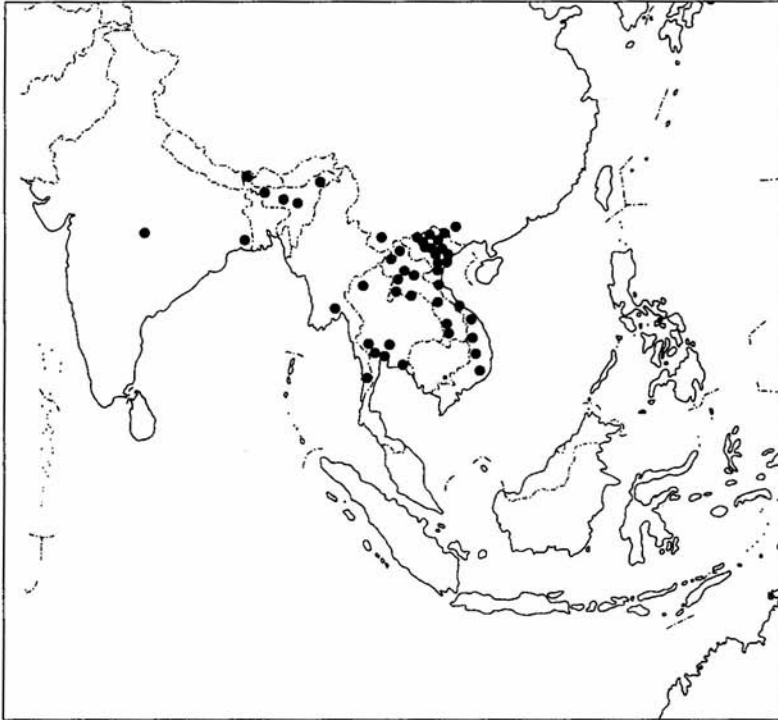
861, 862. *Laccoptera vigintisexnotata*: variation of dorsal pattern

TYPE MATERIAL

Holotype: "Assam" Guerin "Type" (NRS).

DISTRIBUTION

Burma; Chiny: Guangxi, Yunnan; India: Assam; Laos; Malaysia; Thailand; Vietnam (fig. 863).



863. Distribution of *Laccoptera vigintisexnotata*

Subgenus: *Sindiolina* n. sgen.

Body oval, almost parallel-sided. Elytral base only slightly wider than base of pronotum. Pronotum semicircular, with maximum width at the base. Pronotal disc smooth and glossy, at most with indistinct striation and fine pricks. Elytra punctured, without folds, wrinkles or costae. Elytral margin simple marginate. Claws with distinct inner pecten and almost obsolete outer pecten.

Type species: *Cassida sedecimmaculata* BOHEMAN, 1856. Gender: feminine. Only one species in the Oriental Region.

***Laccoptera (Sindiolina) sedecimmaculata* (BOHEMAN, 1856)**

(figs 738, 739, 864-871, tab. 14: 3)

Cassida sedecimmaculata BOHEMAN, 1856: 119, 1862: 290.*Aspidomorpha sedecimmaculata*: GEMMINGER and HAROLD, 1876: 3651.*Cassida (Aspidomorpha) sedecimmaculata*: SPAETH, 1901 a: 347.*Sindia sedecimmaculata*: SPAETH, 1901: 347 (*sedecim-maculata*), 1914 e: 81; MAULIK, 1919: 343;

GRESSITT, 1952: 469; CHEN and ZIA, 1961: 440; GRESSITT and KIMOTO, 1963: 954; YU, 1983:

794; CHEN et al., 1986: 568, 635, pl. XIII (incl. colour fig.); MEDVEDEV and EROSHKINA, 1988:

122; MEDVEDEV, 1992: 35; KIMOTO, 1998: 38; MEDVEDEV and SPRECHER-UEBERSAX, 1999: 350.

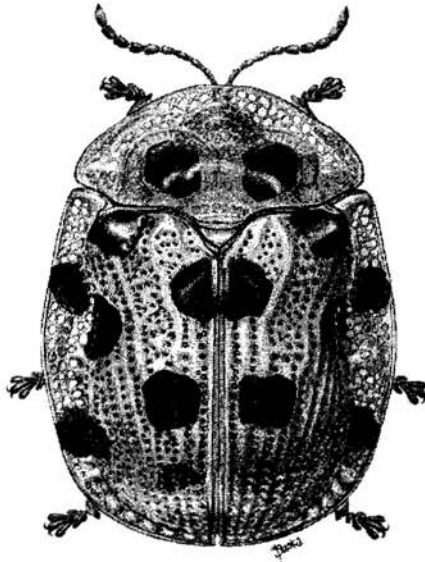
Laccoptera (Sindia) sedecimmaculata: BOROWIEC, 1999: 225

DIAGNOSIS

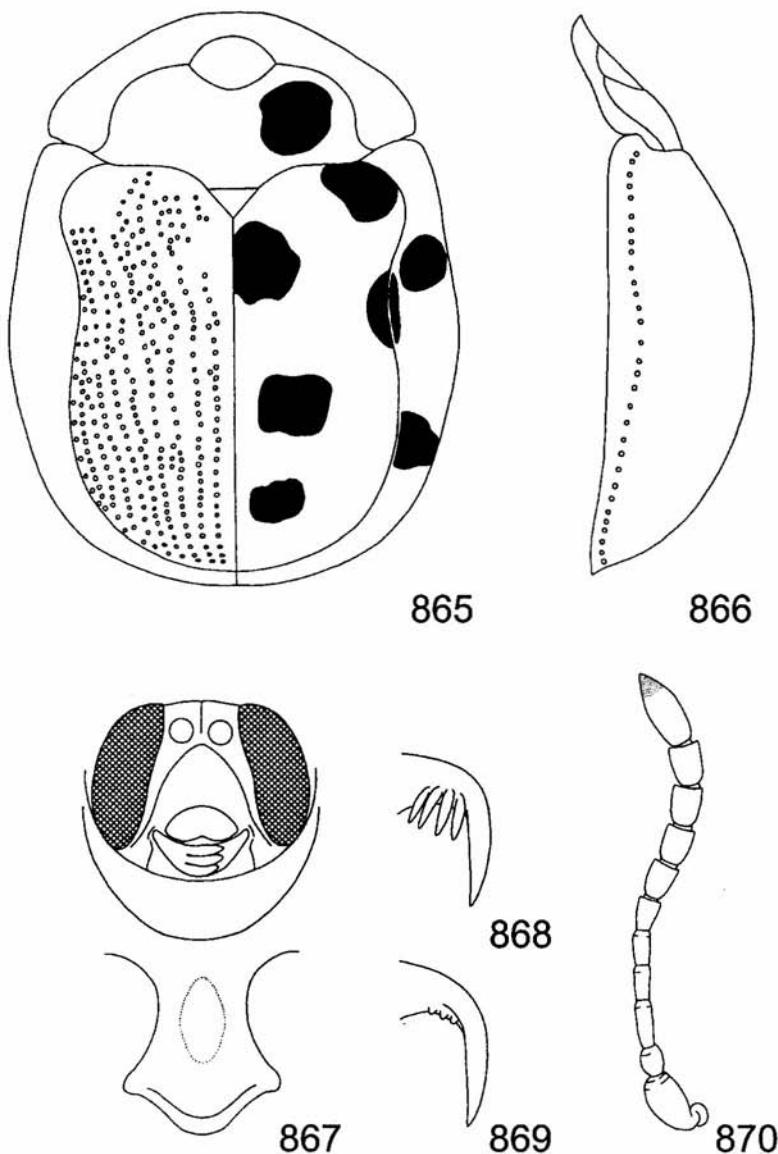
Laccoptera sedecimmaculata differs from all Oriental members of *Laccoptera* in dorsal surface of body without special sculpture, except for puncturation. In body shape, especially in semicircular pronotum and oval elytron, *L. sedecimmaculata* is similar to the subgenus *Sindia*, where was placed by many years, but differs from it in dorsal surface without coarse punctures, costae, or wrinkles. Pronotum of *Sindiolina* has no impressions, while in *Sindia* pronotal surface is distinctly impressed. Lateral margin of elytra is distinctly double marginate in *Sindia*, and simple in *Sindiolina*.

DESCRIPTION

L = 6.7-7.2; W = 4.7-5.1; Lp = 1.7-2.1; Wp = 4.0-4.2; L/W = 1.36-1.45; Wp/Lp = 2.00-2.35. Body oval (fig. 864, 865). Sexual dimorphism barely marked.

864. *Laccoptera sedecimmaculata*, habitus

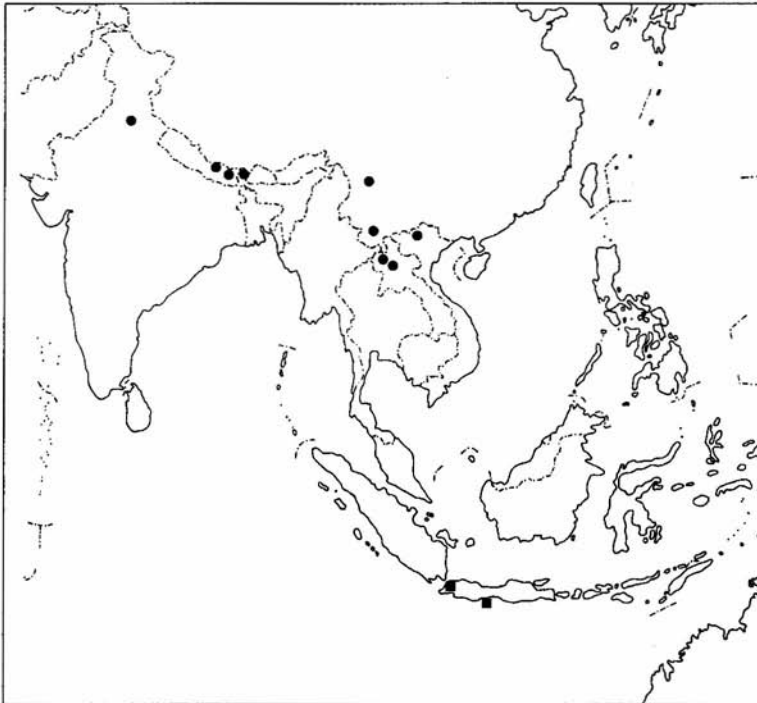
Pronotum yellow or yellowish-brown with two black spots. Ground colour of pronotum often is slightly darker than on elytra. Scutellum yellow. Elytral disc yellow with black spots on intervals 1, 2 and sometimes 3 in the postscutellar area, on intervals 3 and 4 (sometimes 2 thorough 5) at $2/3$ length of disc, on intervals 2-4 in the posterior part of disc, on the humeral callus, and on intervals 8 and 9 close



865-870. *Laccoptera sedecimmaculata*: 865 - body in dorsal view, 866 - body in lateral view, 867 - head and prosternum, 868 - inner side of claw, 869 - outer side of claw, 870 - antenna

to the base of humeral spots on explanate margin. At apex of suture there usually is an elongate spot, connected with the sutural spot on explanate margin (fig. 864). Explanate margin with black humeral, posterolateral, and sutural spots, all usually extend from the border of disc to the extreme margin of marginalia. Humeral spots far from the anterior margin of explanate margin (fig. 864). Humeral spots sometimes form only a round spot in the centre of explanate margin, occasionally the sutural spot is obsolete. Prothorax and mesothorax yellow, metathorax black with yellow lateral plates, abdomen black with yellow margins and yellow transverse band between two basal sternites. Legs yellow, sometimes with a paler ring in the middle of femur. Antennae yellow, usually last segment distinctly darker, yellowish-brown to black; if last segment is black then segments 9 and 10 are yellowish-brown or brown; occasionally antennae uniformly yellow or only the apex of last segment slightly infuscate.

Pronotum almost semicircular, 2.00-2.35 times wider than long, with maximum width in 1/4 basal length. Disc moderately convex, smooth and glossy, usually with fine, sparse puncturation, sometimes with indistinct striation in the middle. Explanate margin smooth and glossy.



871. Distribution of *Laccoptera sedecimmaculata* (black circles) and *Laccoptera multinotata* (black squares)

Elytral base only slightly wider than base of pronotum. Humeral angles rightangled, moderately protrude anterad. Disc regularly convex, without tubercles (fig. 866), and with shallow postscutellar impressions. Puncturation coarse to moderately coarse, distinct along the whole length of disc, usually regular and dense, with numerous additional punctures disturbing the regularity on intervals 4 and 5 in the anterior part of disc and intervals 8 and 9 on the sides of disc. Puncturation on the posterolateral part of disc sometimes completely irregular. Intervals well marked, 2-3 times wider than rows. Surface of intervals smooth and glossy. Explanate margin smooth and glossy. Apex of elytral epipleura bare.

Clypeus approximately 1.5 times wider than long, convex, with a distinct angulation at the top. Labrum broad, emarginate to 1/5 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately broad, usually with a shallow, elongate impression (fig. 867).

Length ratio of antennal segments: 100: 43: 75: 53: 57: 50: 57: 57: 61: 61: 121, segment 3 approximately 1.7 times longer than segment 2 and approximately 1.4 times than segment 4 (fig. 870).

Claws with distinct inner pecten and barely marked outer pecten. Inner pecten with four teeth extending to 2/5 length of claw (fig. 868). Outer pecten with three small teeth only slightly extending beyond the margin of claw (fig. 869).

Aedeagus broad, in basal 3/4 length almost parallel-sided, widened below apex. Apex broadly truncate, without the apical process. Apical part strongly curved ventrad. Ventral side without the membrane (figs 738, 739).

TYPE MATERIAL

Holotype: "Ind. or." "Type" (NRS).

DISTRIBUTION

Burma; China: Guizhou, Yunnan; NE India; Sikkim; Vietnam (fig. 871).

Genus: *Nilgiraspis* SPAETH, 1932

Nilgiraspis SPAETH, 1932 b: 2 (type species: *Aspidomorpha andrewesi* SPAETH, 1914, by monotypy); HINCKS, 1952: 337; SEENO et WILCOX, 1982: 175; CHEN et al., 1986: 589.

Body circular. Antennae with only four basal segments glabrous and shiny, remaining segments pubescent and dull. Elytral base strongly wider than pronotum, humeral angles acute. Pronotum elliptical with broadly rounded sides. Pronotal disc smooth and glossy. Elytral disc regularly punctured, without folds or costae, but with an obtuse postscutellar tubercle. Claws with a short pecten on either margin.

Only one species, widespread in continental part of the Oriental Region.

Nilgiraspis andrewesi (SPAETH, 1932)

(figs 573, 574, 872-882, tab. 6: 7, 8)

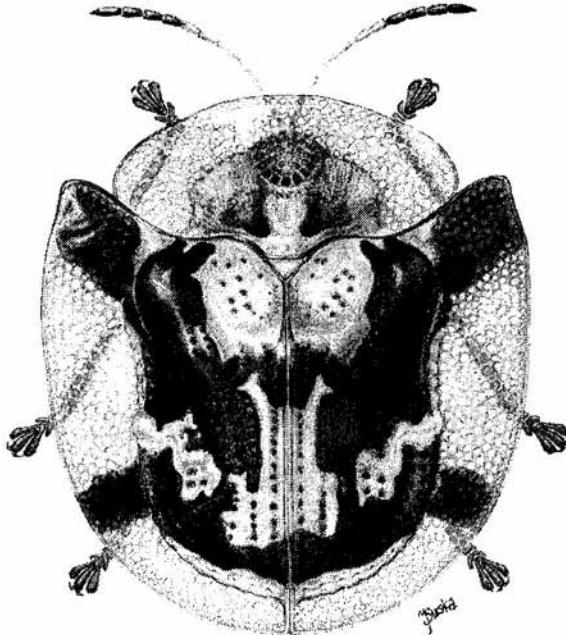
Aspidomorpha Andrewesi SPAETH, 1914 c: 546, 1914 e: 68.*Nilgiraspis andrewesi*: SPAETH, 1932 b: 3; CHEN et al., 1986: 590, 636, pl. XIV (incl. colour fig.);

TAKIZAWA, 1987: 527 (incl. photo); BOROWIEC, 1990 a: 705, 1999: 227.

Cassida sp. 1: TAKIZAWA, 1986: 46.

DIAGNOSIS

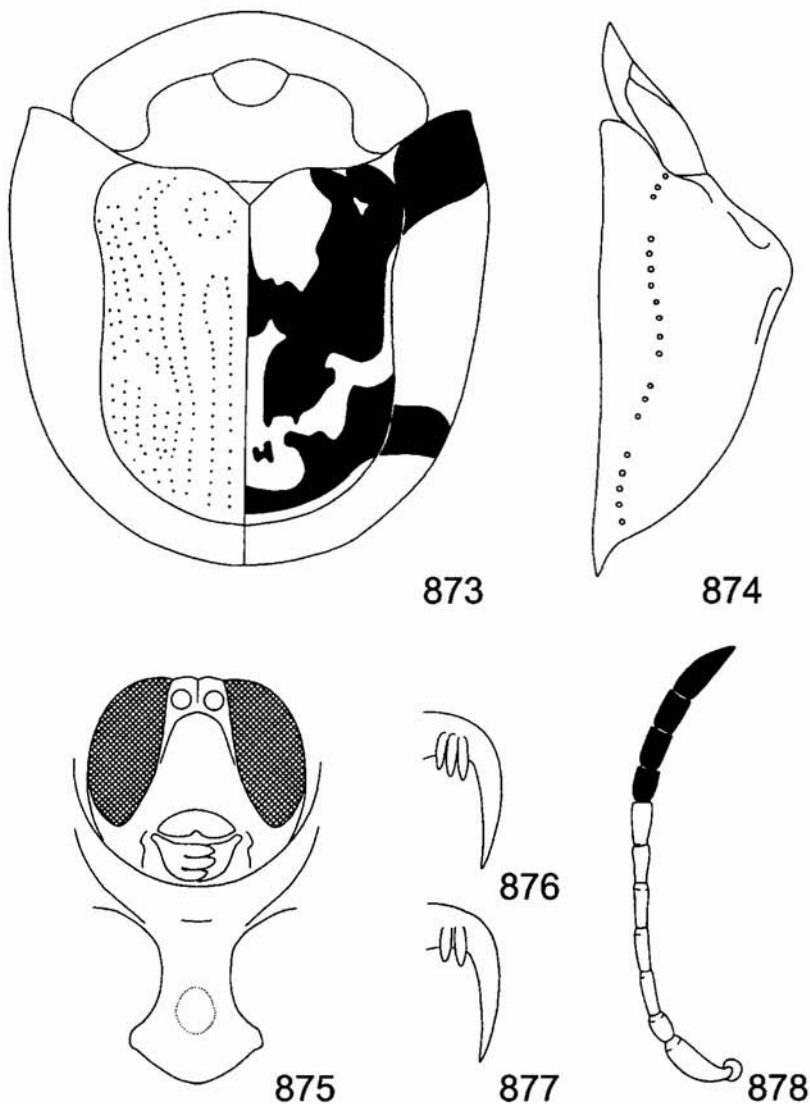
At first glance *Nilgiraspis andrewesi* is very similar to the genus *Aspidomorpha*, but differs in structure of antennae, with only four basal segments glabrous and shiny, and seven distal segments pubescent and dull (in species of the genus *Aspidomorpha* six basal segments are bare and glossy). *N. andrewesi* also has third segment of antennae short, not longer than fourth segment (in most members of *Aspidomorpha* third segment is elongate, distinctly longer than the fourth). *N. andrewesi* has similar the body shape and colour to *Cassida ruralis* (Boh.), which is widespread in the Oriental Region. This sometimes leads to misidentifications, e.g. a colour photo in KIMOTO's (1998) paper shows a specimen of *N. andrewesi* rather than *Cassida ruralis*. *N. andrewesi* has claws with pectens, while the claws in *C. ruralis* are without pectens and appear slightly appendiculate due to distally projecting sides of the last tarsal segment.

872. *Nilgiraspis andrewesi*, habitus

DESCRIPTION

$L = 5.3-6.1$; $W = 4.4-5.3$; $L_p = 1.7-1.9$; $W_p = 3.1-3.6$; $L/W = 1.15-1.20$; $W_p/L_p = 1.82-1.94$. Body broadly-oval (figs 872, 873), sexual dimorphism indistinct.

Pronotum and scutellum yellow to yellowish-brown, without spots, or sometimes disc of pronotum with two large, brown to black spots of indistinct borders (figs 879-881). Elytral disc yellowish-brown or reddish-brown to black with a pale pattern composed of a yellow spot covering postscutellar impressions and



873-878. *Nilgiraspis andrewesi*: 873 - body in dorsal view, 874 - body in lateral view, 875 - head and prosternum, 876 - inner side of claw, 877 - outer side of claw, 878 - antenna

anterior part of postscutellar tubercle, a yellow oblique spot at 2/3 length of disc between intervals 5-9, and a yellow spot along the suture extending to second row of punctures in posterior half of disc; the extreme apex of disc also is yellow. An oblique spot on the sides of disc sometimes coalesces with the spot along the suture, and then the elytra bears a yellow V-shaped band (figs 879-881). Explanate margin of elytra with yellowish-brown to black humeral and posterolateral spots (fig. 804). Posterior part of the postscutellar tubercle and the sides of disc are often darker than other dark areas of disc and then posterolateral spots on explanate margin are darker than the humeral spots, which are of the same colour as the sides of disc (fig. 879). Ventrites and legs yellow. Antennae yellow, four last segments black.

Pronotum elliptical, 1.82-1.94 times wider than long, with maximum width in basal 1/3 length, sides rounded. Disc moderately convex, smooth and glossy. Explanate margin smooth and glossy.

Elytral base distinctly wider than base of pronotum. Humeral angles subacuminate, protrude anterad. Margin behind angles usually shallowly emarginate. Elytral disc convex, with a broad, conical but obtuse postscutellar tubercle (fig. 874), and postscutellar, principal and lateral impressions. Puncturation regular, moderately coarse to fine, distinct along the whole length of disc. Intervals mostly equal in width, approximately four times wider than punctures. Surface of intervals glossy and shiny. Explanate margin of elytra glossy and shiny. Apex of elytral epipleura with dense hairs.

Clypeus 1.2 times wider than long, without an impression. Labrum broad, emarginate to 1/4 length. Mandibles with distinct teeth. Prosternal process rhomboidal, moderately wide, with a distinct median impression (fig. 875).

Length ratio of antennal segments: 100: 40: 62: 62: 94: 59: 62: 47: 53: 56: 106, segment 3 approximately 1.5 times longer than segment 2 and as long as 4 (fig. 878).

Claws with distinct pectens on both sides. Inner pecten with three teeth extending to 1/3 length of claw (fig. 876), outer pecten with two teeth extending to 1/4 length of claw (fig. 877).



879-881. *Nilgiraspis andrewesi*: variation of dorsal pattern

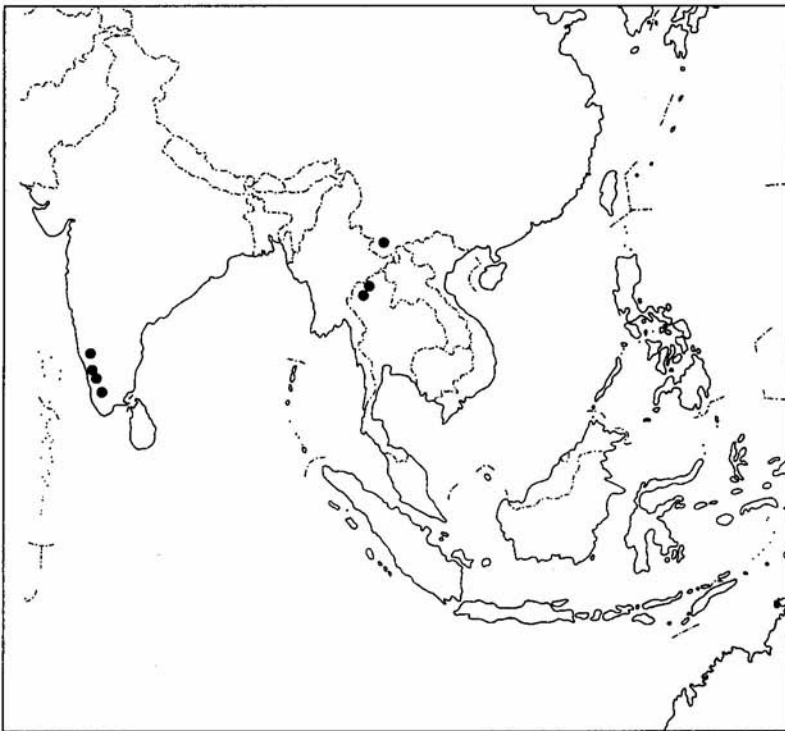
Aedeagus moderately broad, widened apically, with a large and truncate apical process. Apical part gently curved ventrad. Ventral side without the membrane (figs 573, 574).

TYPE MATERIAL

Syntype: "Nilgiri Hills" "Type" "Asp. andrewesi m. type" (BMNH); syntype: "H.L. Andrewes, Nilgiri Hills" "Type" (MM); syntype: "Nilgiri Hills" "Andrew. don." "216 D" "Andrewesi m. type!" (MM).

DISTRIBUTION

S India; China: Yunnan; Thailand (fig. 882).



882. Distribution of *Nilgiraspis andrewesi*

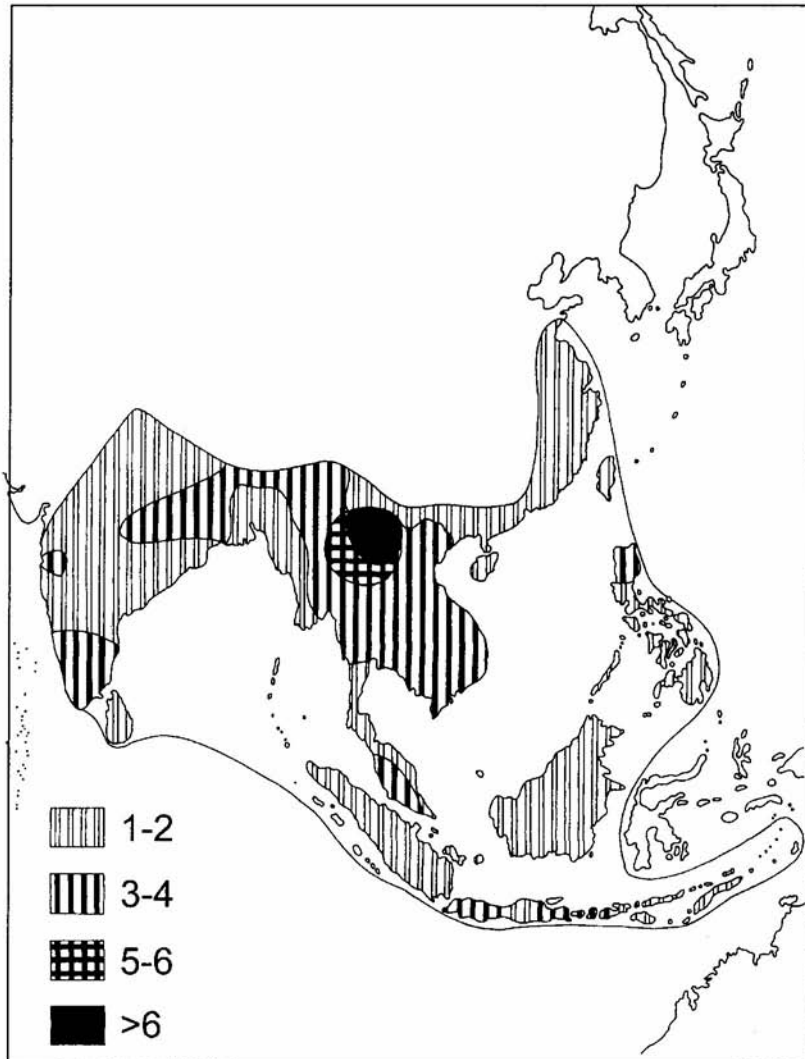
ZOOGEOGRAPHICAL NOTES

At present the tribe *Aspidimorphini* comprises 279 species, in 6 genera, four genera are monotypic, and each of the remaining two is subdivided into 10 subgenera (table 1).

Table 1. Zoogeographic distribution of the tribe *Aspidimorphini*.

Genus and subgenus	Number of species			
	Ethiopian	Oriental	Australian	Total
1. <i>Aspidimorpha</i>	131	50	15	193
<i>s. str.</i>	91	49	14	151
<i>Afroaspidimorpha</i>	11	-	-	11
<i>Aspidocassis</i>	4	-	-	4
<i>Dianaspis</i>	-	1	-	1
<i>Megaspidomorpha</i>	3	-	-	3
<i>Neoaspidimorpha</i>	-	-	1	1
<i>Semiaspidimorpha</i>	8	-	-	8
<i>Spaethia</i>	11	-	-	11
<i>Spaethiomorpha</i>	1	-	-	1
<i>Weiseocassis</i>	2	-	-	2
2. <i>Conchyloctenia</i>	15	1	-	16
3. <i>Hybosinota</i>	2	-	-	2
4. <i>Laccoptera</i>	37	28	1	66
<i>s. str.</i>	6	-	-	6
<i>Asphalesia</i>	6	-	-	6
<i>Laccopteroidea</i>	-	16	1	17
<i>Orphnoda</i>	2	-	-	2
<i>Orphnodella</i>	20	2	-	22
<i>Orphnodina</i>	2	-	-	2
<i>Patrisma</i>	1	-	-	1
<i>Sindia</i>	-	2	-	2
<i>Sindiola</i>	-	7	-	7
<i>Sindiolina</i>	-	1	-	1
5. <i>Mahatsinia</i>	1	-	-	1
6. <i>Nilgiraspis</i>	-	1	-	1
Total	186	80	16	279

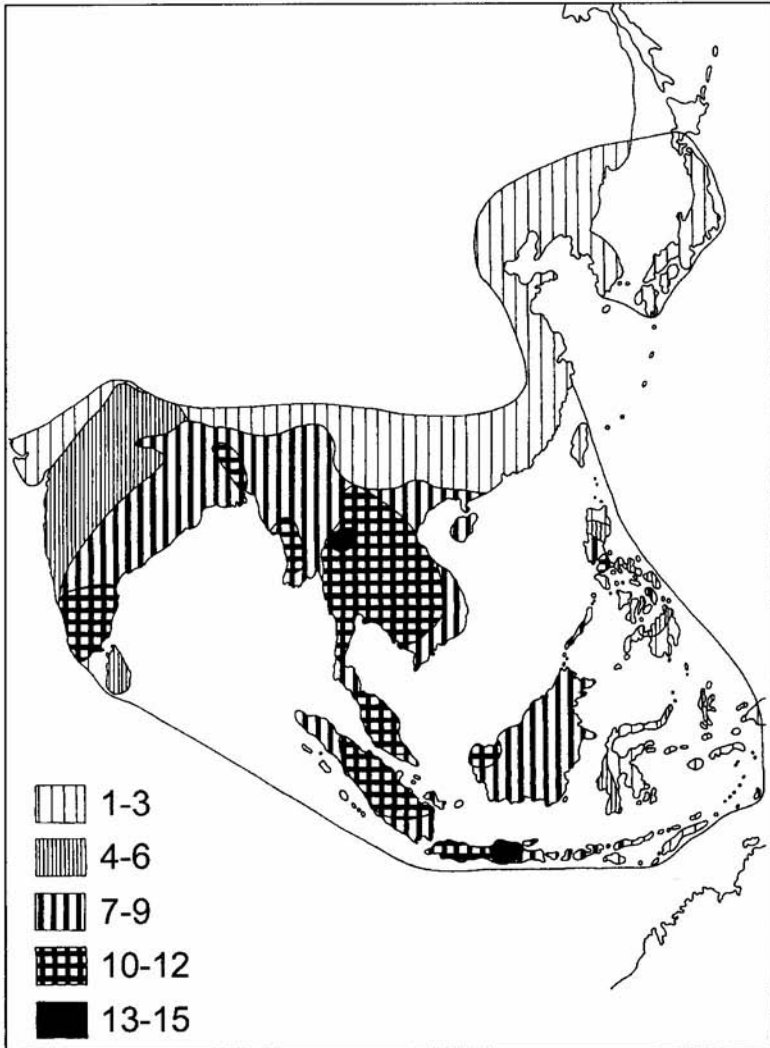
The greatest numbers of genera and species occur in the Afrotropical Region including Madagascar. Actually, 186 species (66.7%) and 17 genera and subgenera (71%) are known from the Afrotropical Region. The Oriental Region is less speciose, with only 80 known species (28.7%) and 10 genera and subgenera (41%). The poorest in taxa is the Australian Region, with only 16 species (5.7%) and 3 genera and subgenera (12.5%). The degree of endemism is very high. All Afrotropical species are endemic and 13 (54%) genera and subgenera are limited to this region. The Oriental Region is also highly distinctive, with 77 out of 80 species are endemic, and only three shared with the Australian Region. One of



883. Distribution centre of the genus *Lacoptera* (numbers indicate number of species)

these three shared species, *A. miliaris*, is of Oriental origin, and the remaining two, *A. adherens* and *A. deusta*, are of Australian origin. Two species: *A. difformis* and *A. transparipennis* are distributed in border area between Palaearctic and Oriental regions with greatest part of the range in eastern Palaearctics.

Based on diversity, degree of endemism, and distributions of species (number of species with limited ranges vs. number of species with wide ranges) the origin area of the tribe *Aspidimorphini* undoubtedly lies in Africa. Because these beetles are dependent on the *Convolvulaceae* and *Solanaceae*, especially on the genera preferring humid and warm climate, they probably originated in subtropical and



884. Distribution centre of the genus *Aspidimorpha* (numbers indicate number of species)

tropical forested regions. The age of strongest radiation of *Solananae* group, includes *Solanaceae* and *Convolvulaceae* families, was dated on the boundary between Mesozoic and Cenozoic (TAKHTADJAN 1987). It is possible that the ancestors of *Aspidimorphini* lineage existed already in the Palaeocene because the *Solananae* are under the most poisonous plants, and adaptation to these hosts needs a long time of adaptive coevolution. Unfortunately, no fossil *Aspidimorphini* are hitherto known, but members of the specialised sister group *Cassidini* were described from the Eocene brown coal (HAUPT 1952). It suggests that highly specialized *Cassidinae* may have been widespread in by that time.

The main routes of migrations were from west to east, as indicated by decreasing numbers of genera and species in this direction. *Aspidimorphini* are well flying beetles and their aerial dispersion was easy. It is difficult to ascertain which dispersion route was the most effective. One of two most likely routes is via the border regions between Africa and Asia, where the habitats appropriate for the cassids existed of the beginning of Tertiary (VAN ANDEL 1991). Another likely possibility is using the eastward drift of the Indian Subcontinent. The latter route looks more probable, because of the Indian distribution of the genus *Conchylactenia* and members of the subgenus *Orphnodella*. Also *A. orientalis* from India is closer to the African members of *A. cincta* group than to any other Oriental group. But it is also possible that these taxa represent an old faunal element from the period when Africa, Madagascar, and India belonged to one continent.

Dispersion on Asiatic continents caused from dispersion and diversification of food plants and habitats. The recent distribution centres (figs 883) suggested that for the genus *Laccoptera* main centre of origin was in highlands of S China and Burma, and secondary centres are in S India, Java and the N Philippines. Similar situation is with the genus *Aspidimorpha*, but its centre of distribution is larger and less concentrate, and apart from S China and Burma comprises also large part of Indochina and Sumatra (fig. 884). The situation is correlated with distribution and diversity of *Convolvulaceae* plants in the Oriental Region. The regions of the highest endemism are S India and Sunda Is.

Limited number of new species (12.5%) described in the revision suggested that Oriental fauna of *Aspidimorphini* is rather well known. In the other hand some regions were not explored in recent times, especially Moluccas, southern Philippines islands, eastern Indonesian islands, and Sulawesi. Because these regions are characterized by a number of endemic taxa it is possible to find there some new species.

Beetles from the tribe *Aspidimorphini* are mostly connected with primeval tropical forests. Many of species studied in the revision were not collected in recent time, especially from Java, Sumatra and the northern Philippines recent materials are scarce and comprise common species connected with anthropogenic habitats, despite that these regions was intensively explored by professional collectors. It testify the threatness by extinction of these forest taxa.

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Table 1: 1. *Aspidimorpha sanctaerucis*, ootheca; 2. *A. miliaris*, living specimen; 3. *Laccoptera quatuordecimnotata*, living specimens (by courtesy of Dr. H.V. GHATE)



Table 2: 1-3. *Aspidimorpha miliaris*: 1 – larva and pupa, 2 – cycloalectic larvae, 3 – pupae (by courtesy of Dr. H.V. GHATE)

Table 3

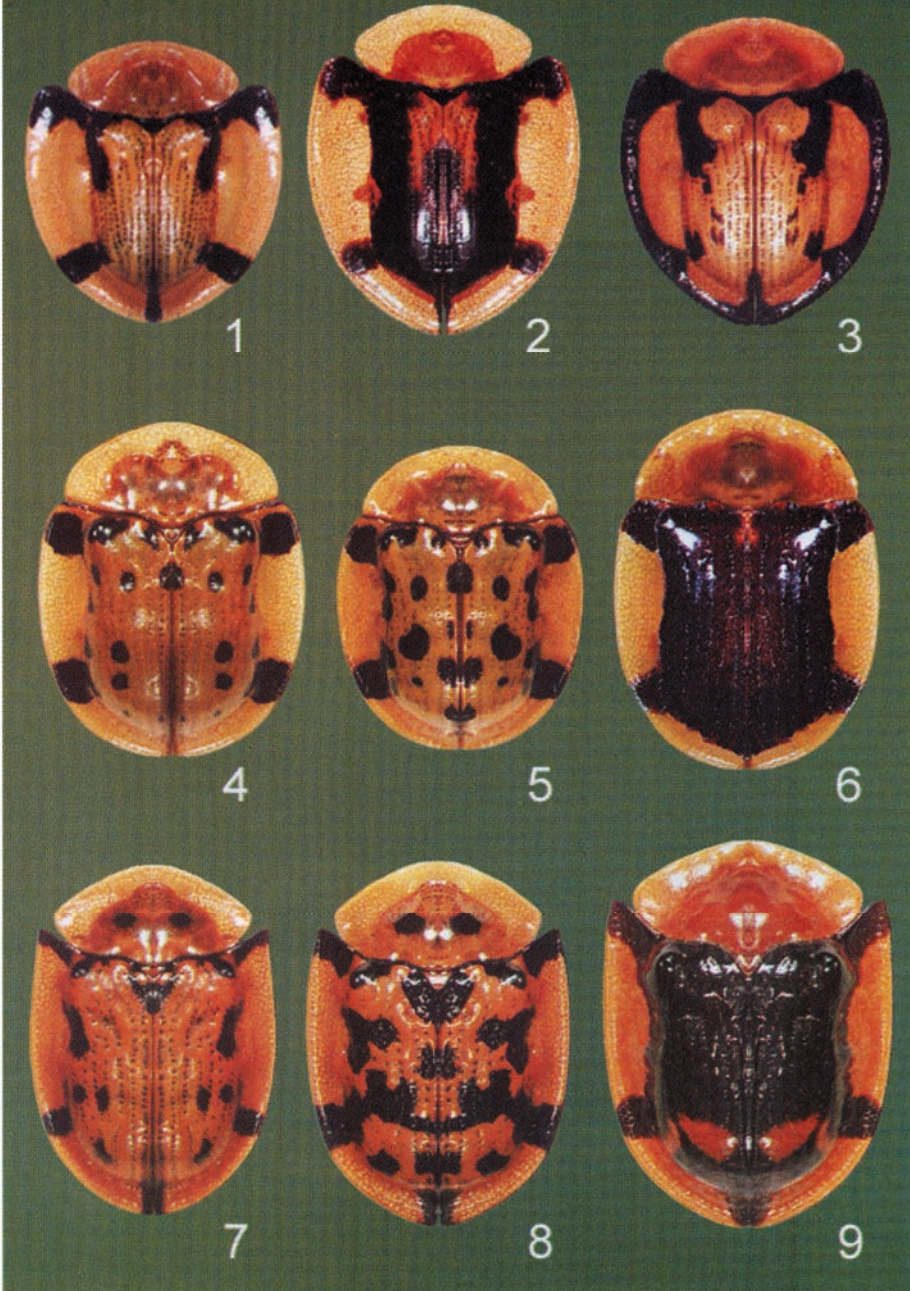


Table 3: 1-3. *Aspidimorpha adhaerens*; 4-6. *A. orientalis*; 7-9. *A. deusta*

Table 4

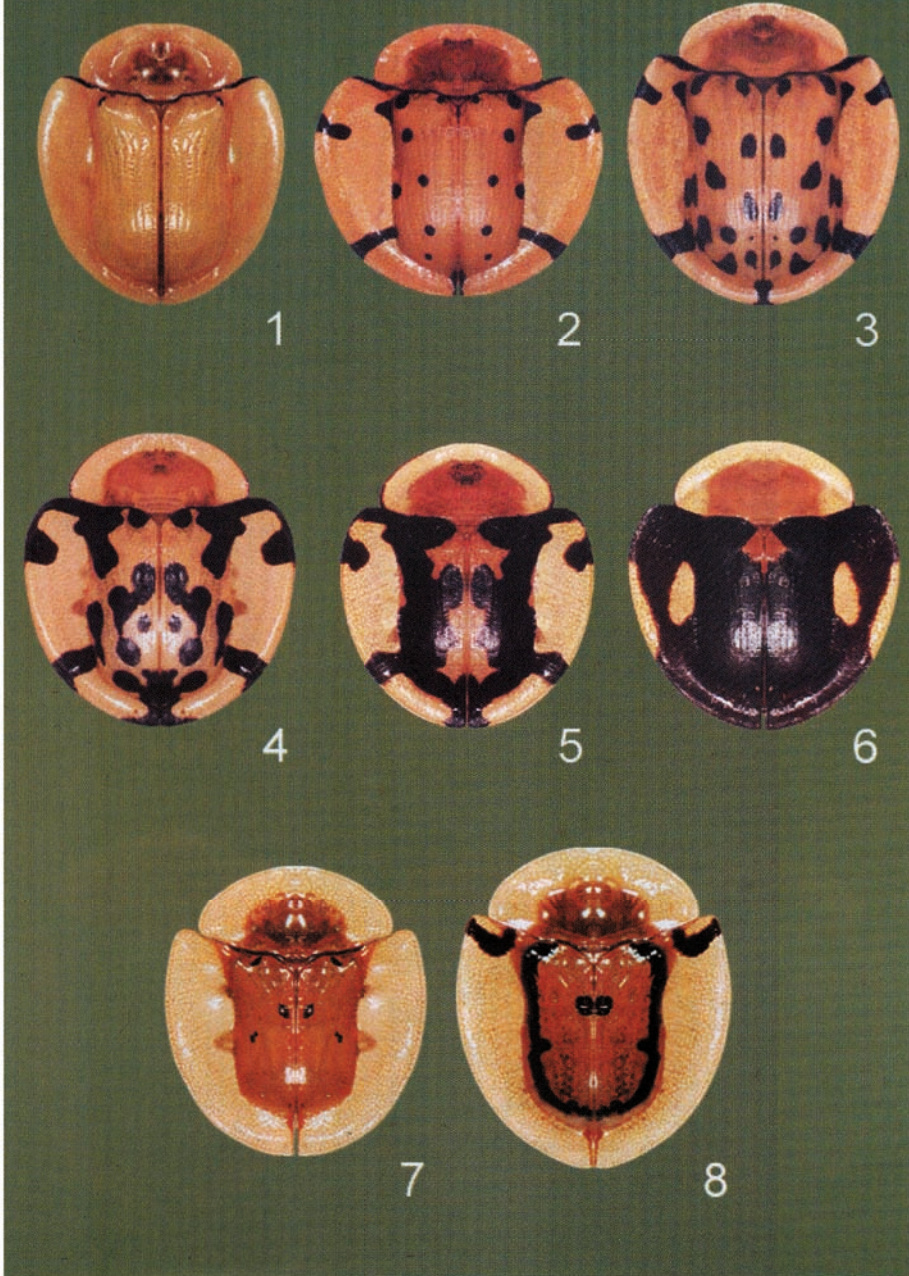


Table 4: 1-6. *Aspidimorpha miliaris* (1 – female of pale form from New Guinea, 2 – hypertrophic male from the Philippines); 7, 8. *A. hexaspilota*

Table 5

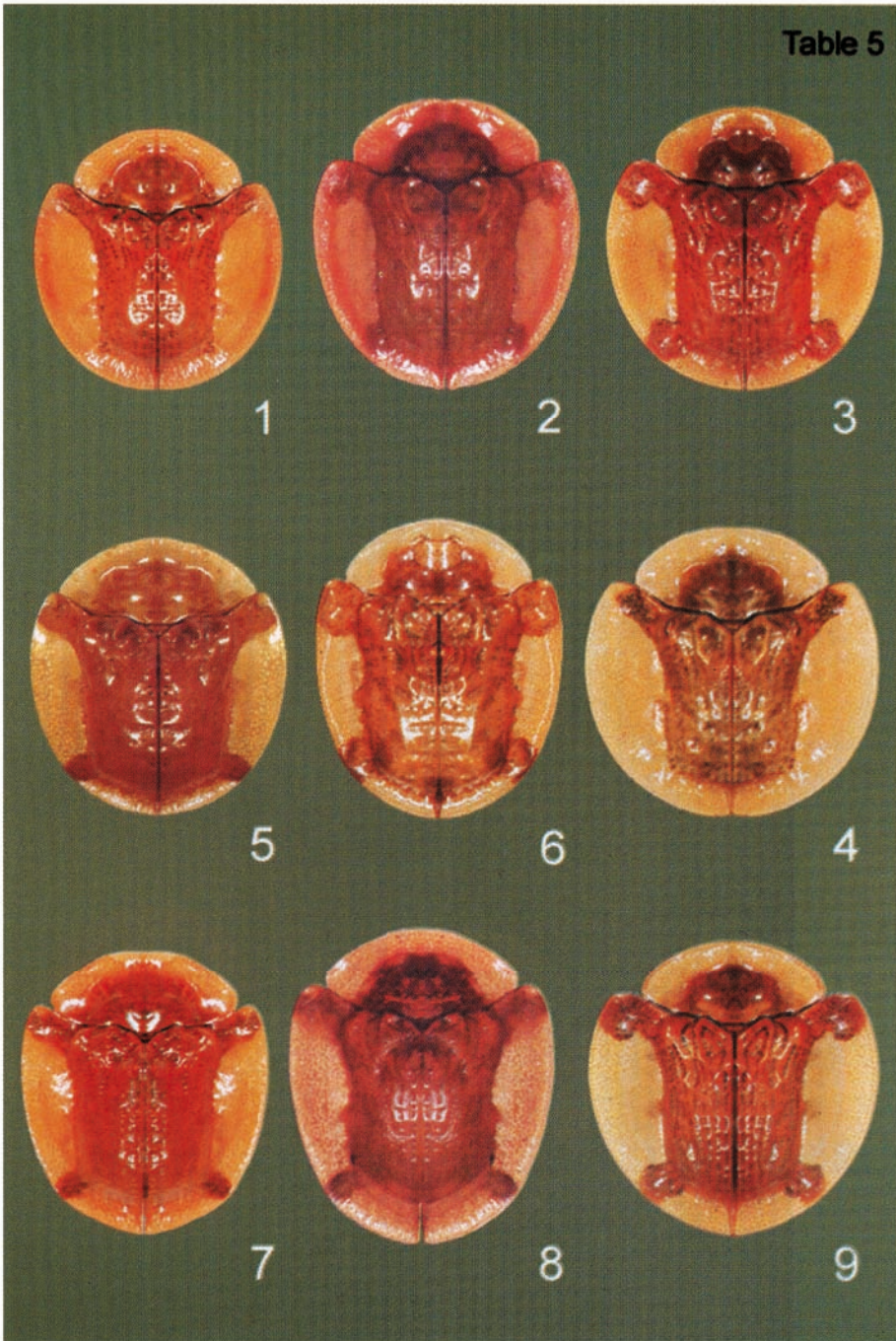


Table 5: 1, 2. *Aspidimorpha bataviana*; 3, 4. *A. sanctaerucis* (3 – typical form, 4 – form from Hainan); 5. *A. lobata*; 6. *A. birmanica*; 7, 8. *A. inuncta*; 9. *A. tamdaoensis*

Table 6

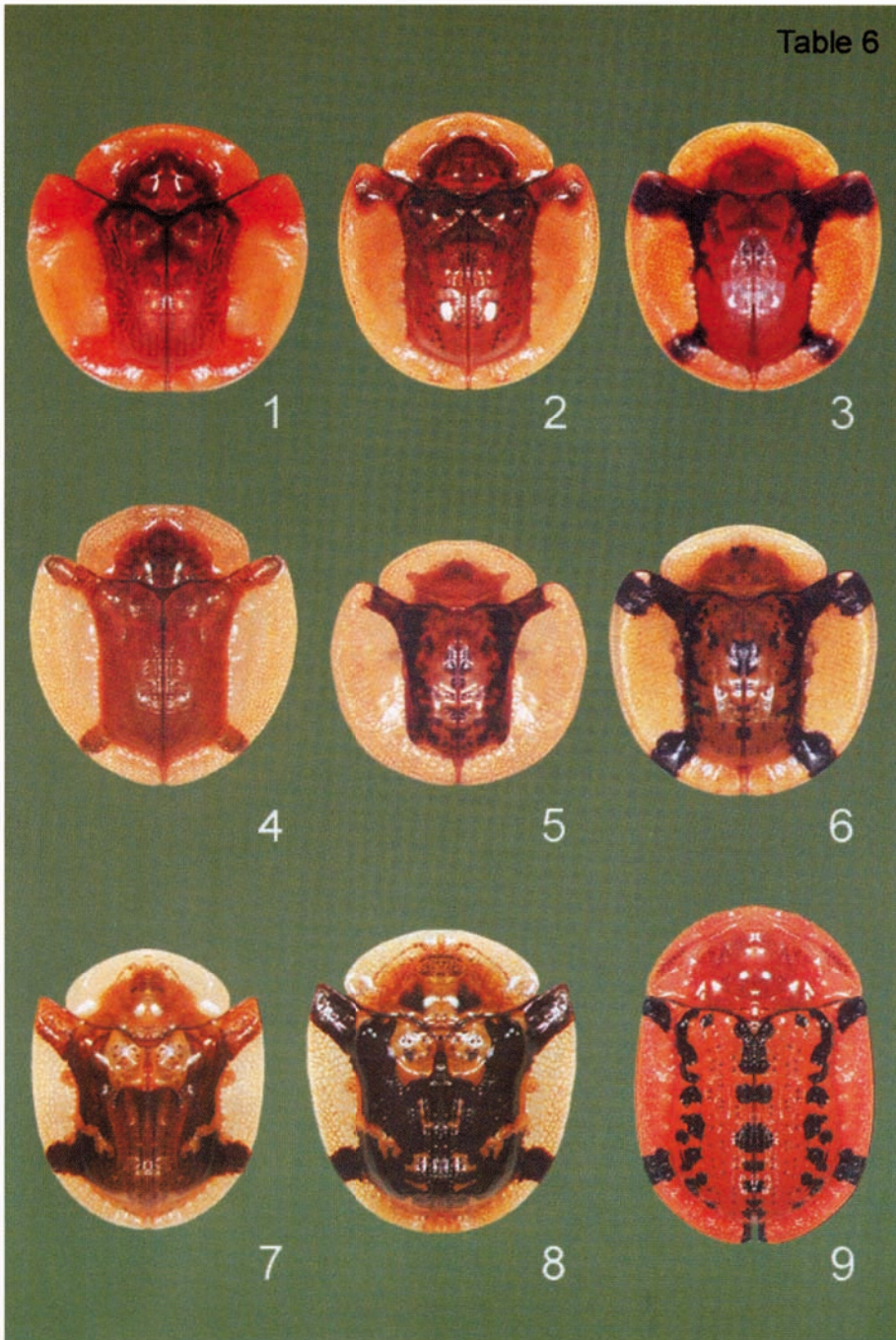


Table 6: 1, 2. *Aspidimorpha castaneipennis* (1 – typical form, 2 – ab. *borneensis*);
 3. *A. ponderosa*; 4. *A. stevensi*; 5, 6. *A. malaccana*; 7, 8. *Nilgiraspis andrewesi*;
 9. *Conchyloctenia nigrovittata*

Table 7

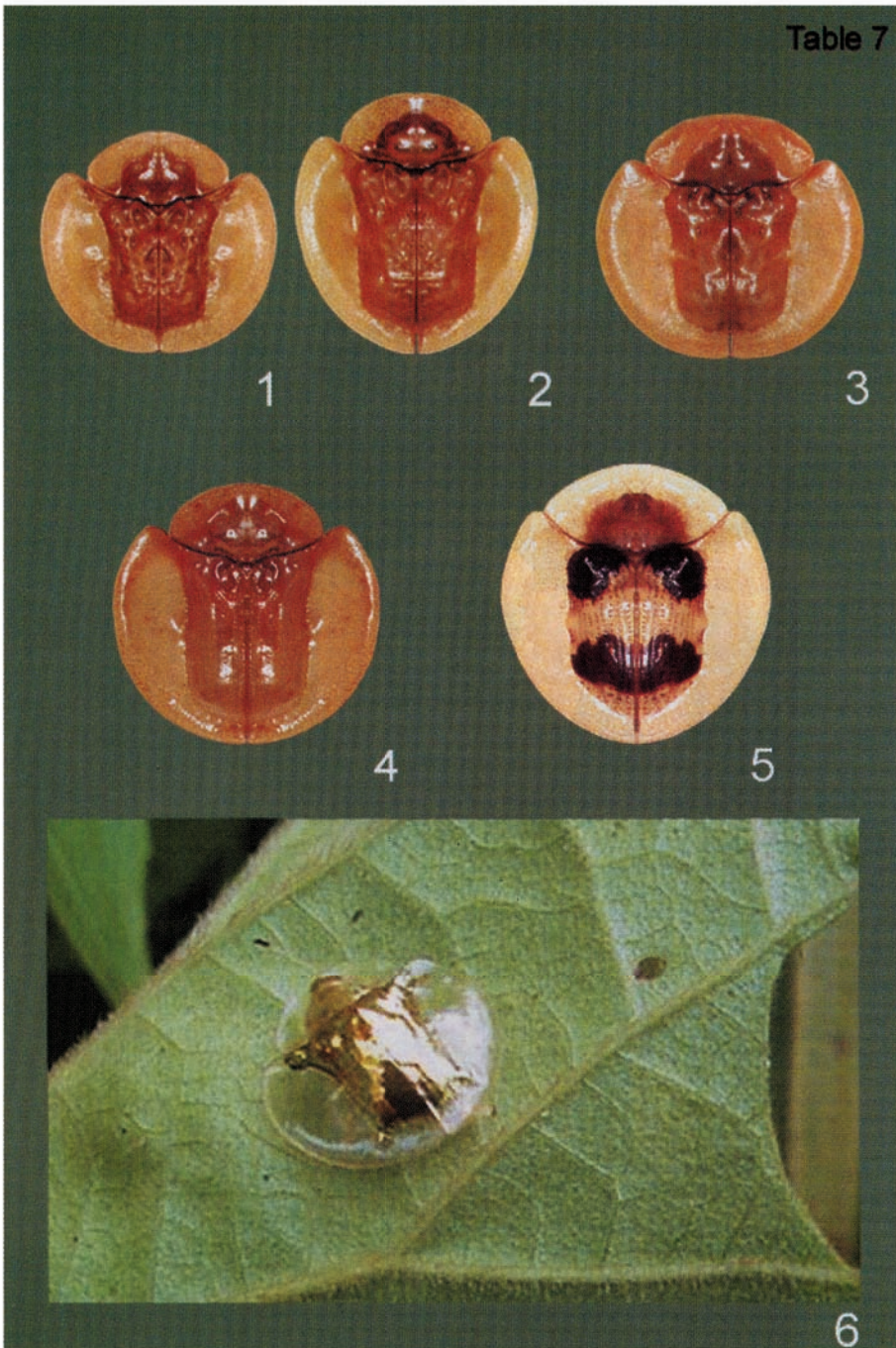


Table 7: 1, 2, 6. *Aspidimorpha elevata* (1 – male, 2 – female, 6 – living specimen);
3. *A. limbipennis*; 4. *A. sarawacensis*; 5. *A. sarasinorum*

Table 8

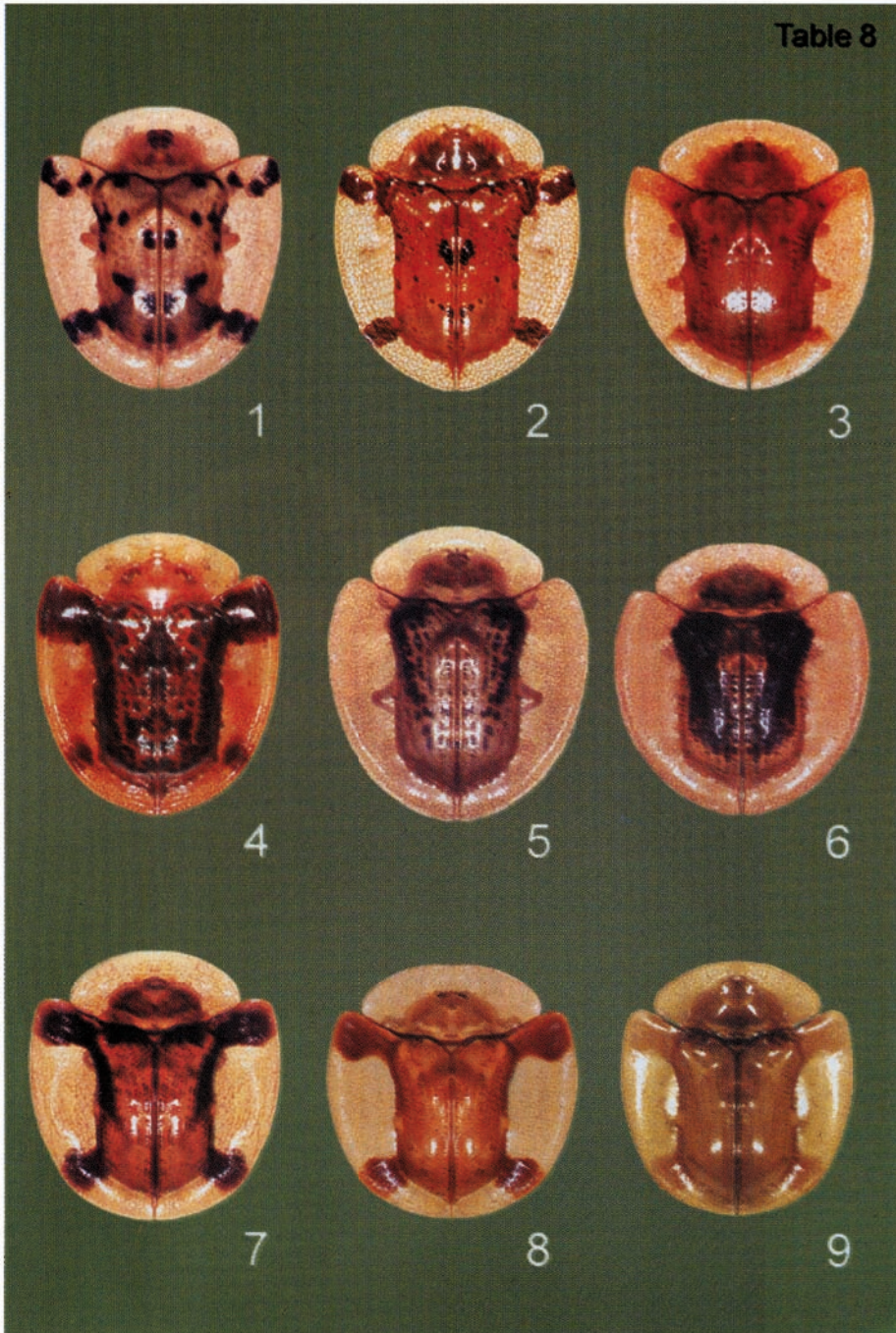


Table 8: 1. *Aspidimorpha inquinata*; 2. *A. musta*; 3. *A. pacalis*; 4. *A. biradiata*; 5, 6. *A. limbata*; 7. *A. suavis*; 8. *A. intermedia*; 9. *A. subcruciata*

Table 9

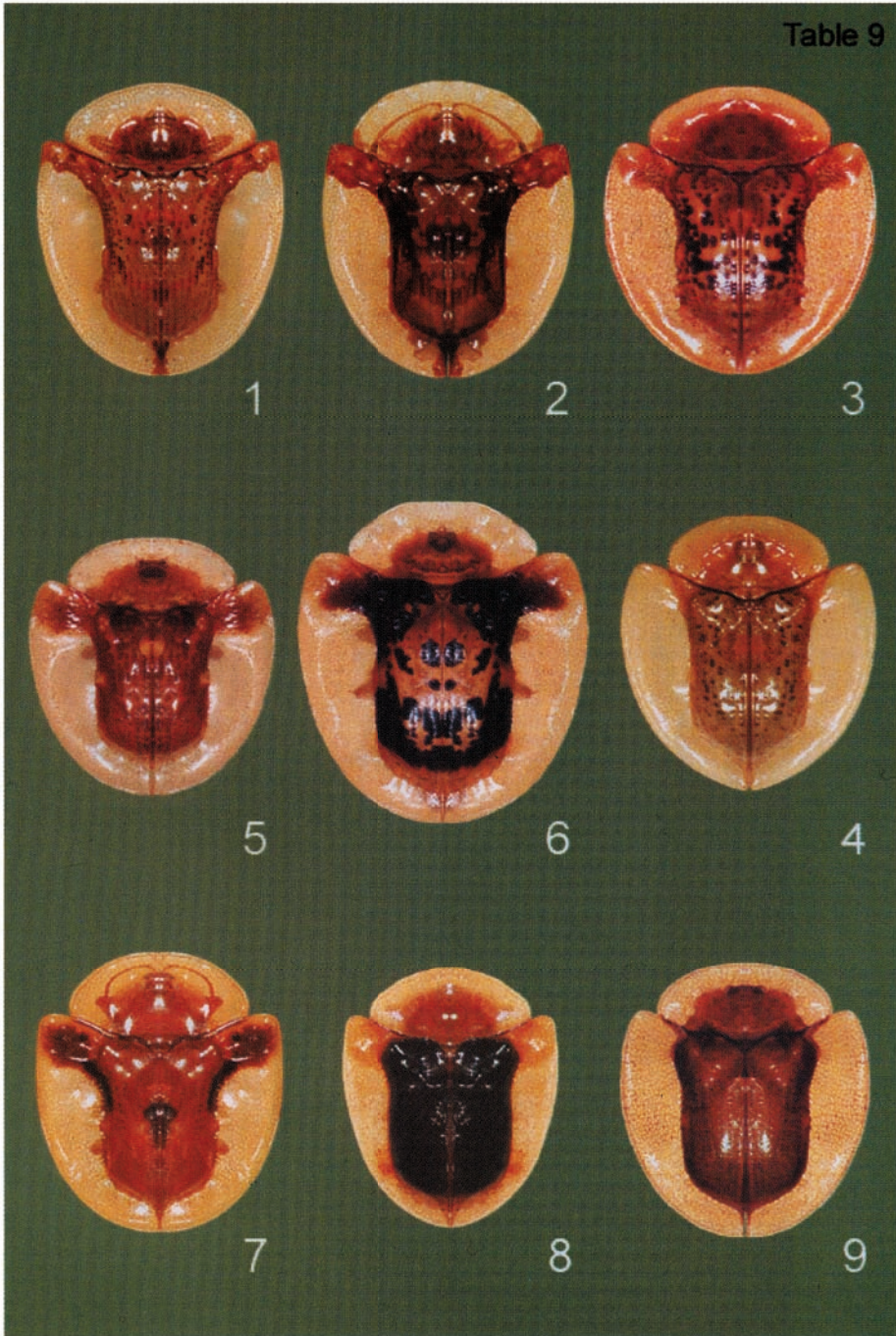


Table 9: 1, 2. *Aspidimorpha chandrika*; 3, 4. *A. fuscopunctata*; 5, 6. *A. dorsata*; 7, *A. dulcicula*; 8. *A. moluccana*; 9. *A. sulawesica*

Table 10

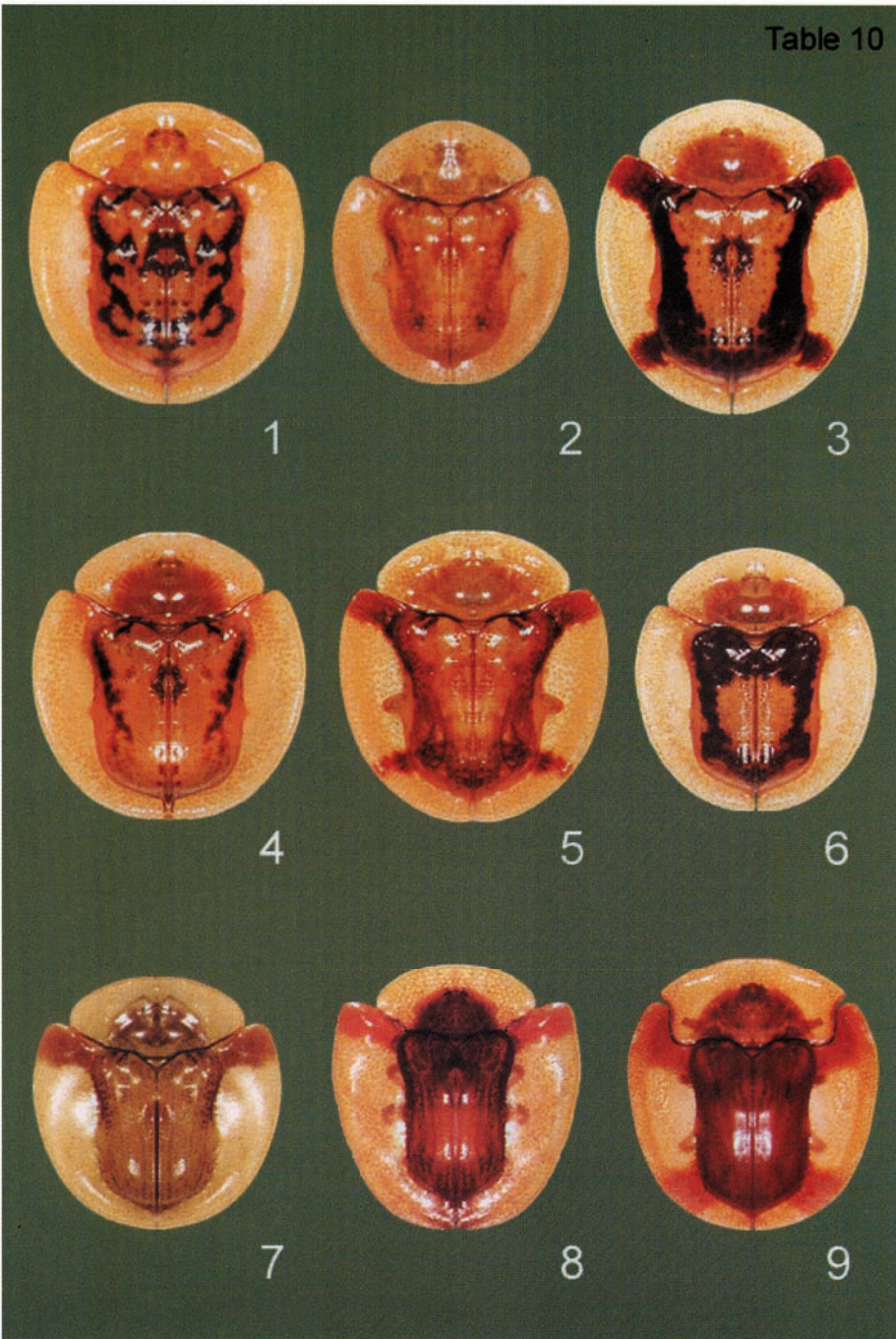


Table 10: 1-3. *Aspidimorpha fusconotata*; 4-6. *A. orbicularis*; 7. *A. bilobata*;
8. *A. luzonica*; 9. *A. quadrilobata*

Table 11

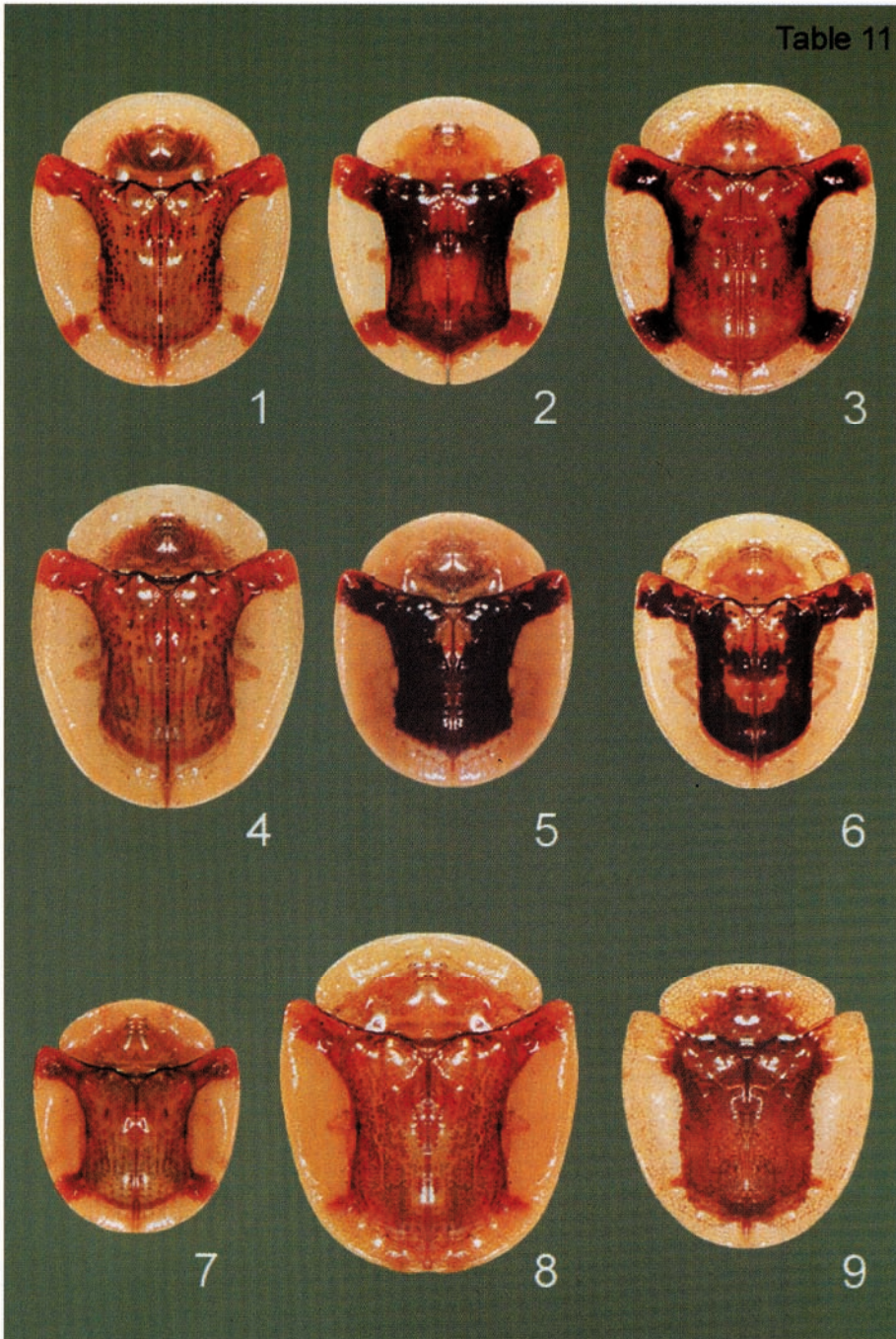


Table 11: 1-5. *Aspidimorpha furcata* (1, 3, 5 – male, 2, 4 – female); 6. *A. biremis*;
7, 8. *A. amabilis* (7 – male, 8 – female); 9. *A. timorensis*

Table 12

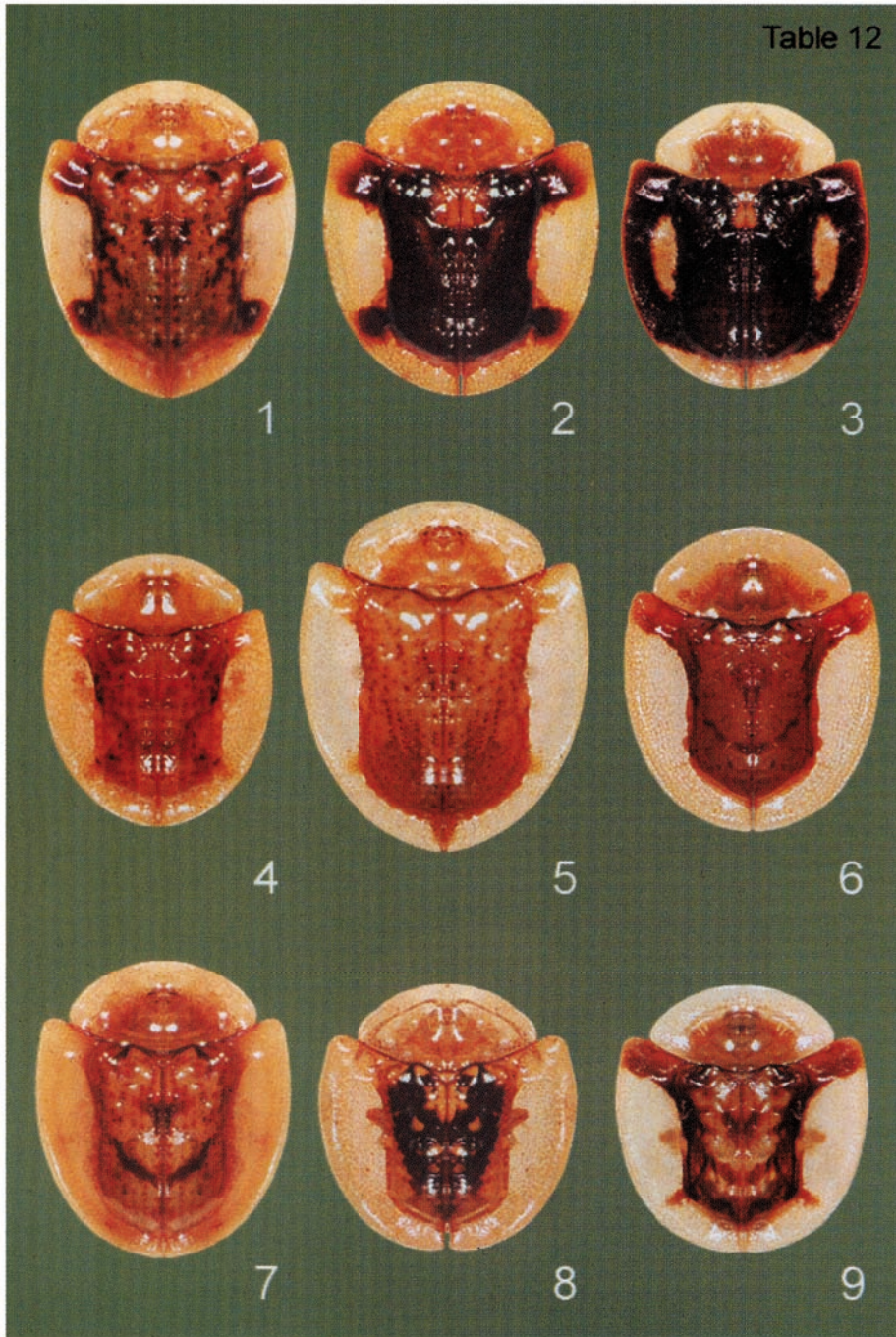


Table 12: 1-5. *Aspidimorpha mutilata* (1, 4, 5 – female, 2, 3 – male);
6-9. *A. assimilis* (6, 7 – female, 8, 9 – male)

Table 13

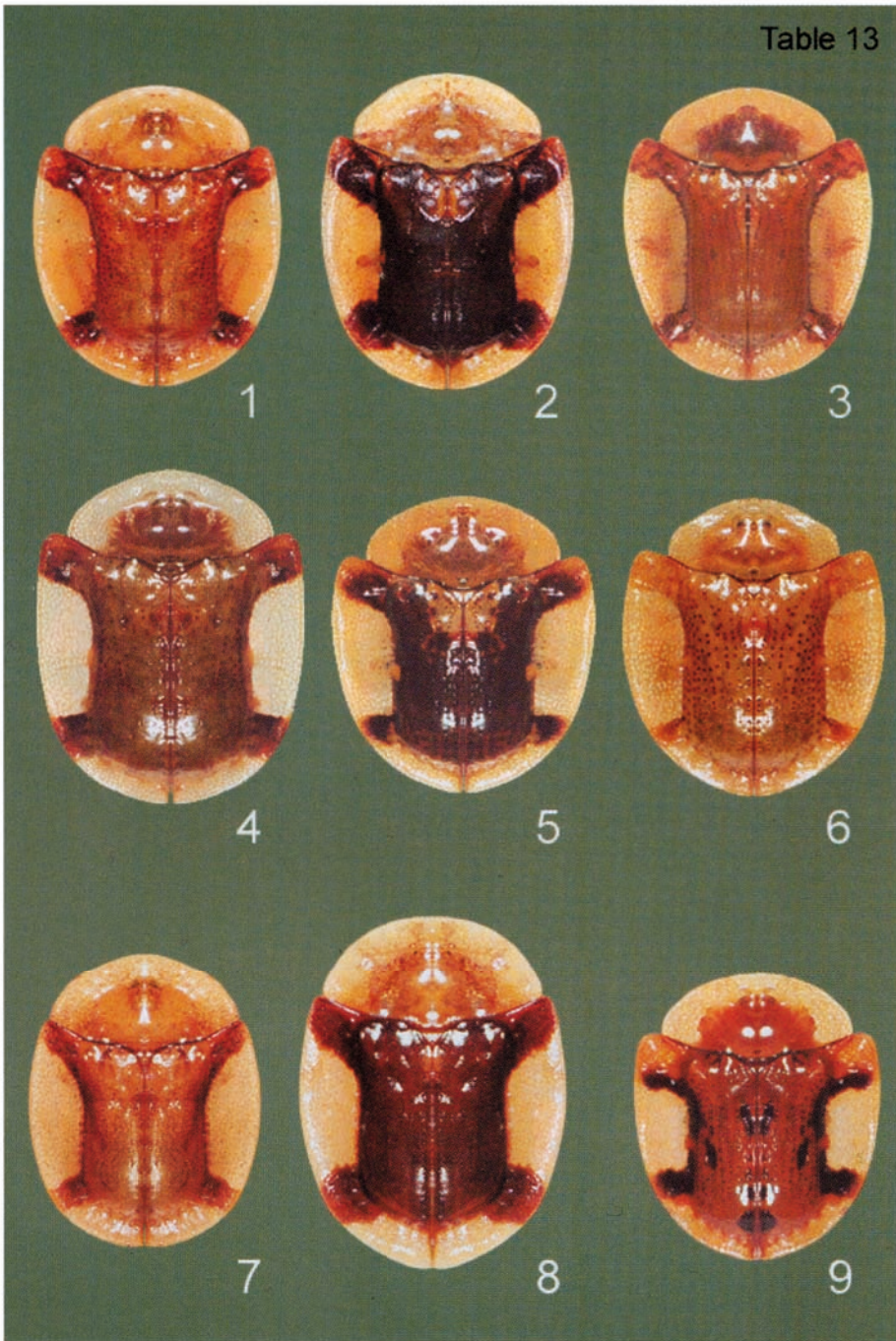


Table 13: 1, 2. *Aspidimorpha difformis*; 3. *A. snizeki*; 4-6. *A. indica* (4 - female, 5, 6 - male); 7, 8. *A. transparipennis*; 9. *A. toxopei*

Table 14



Table 14: 1, 2. *Aspidimorpha denticollis* (1 – male, 2 – female); 3. *Lacoptera sedecimmaculata*; 4, 5. *L. sulcata*; 6. *L. depressa*; 7. *L. jawalagiriana*; 8. *L. foveolata*

Table 15

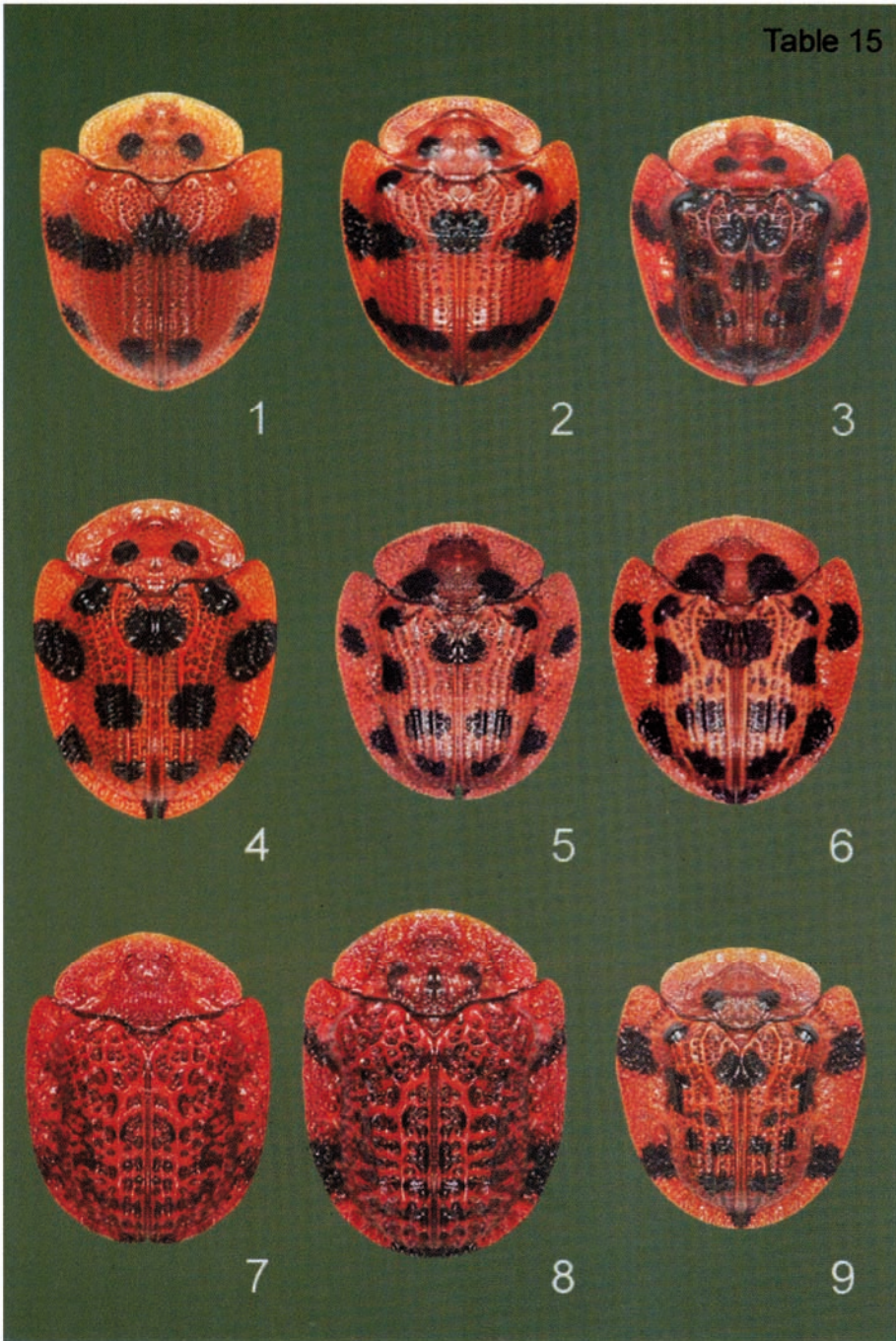


Table 15: 1. *Laccoptera discreta*; 2. *L. fasciata*; 3. *L. sculpturata*;
4. *L. quatuordecimnotata*; 5, 6. *L. sedecimnotata*; 7, 8. *L. yunnanica*; 9. *L. sutteri*

Table 16

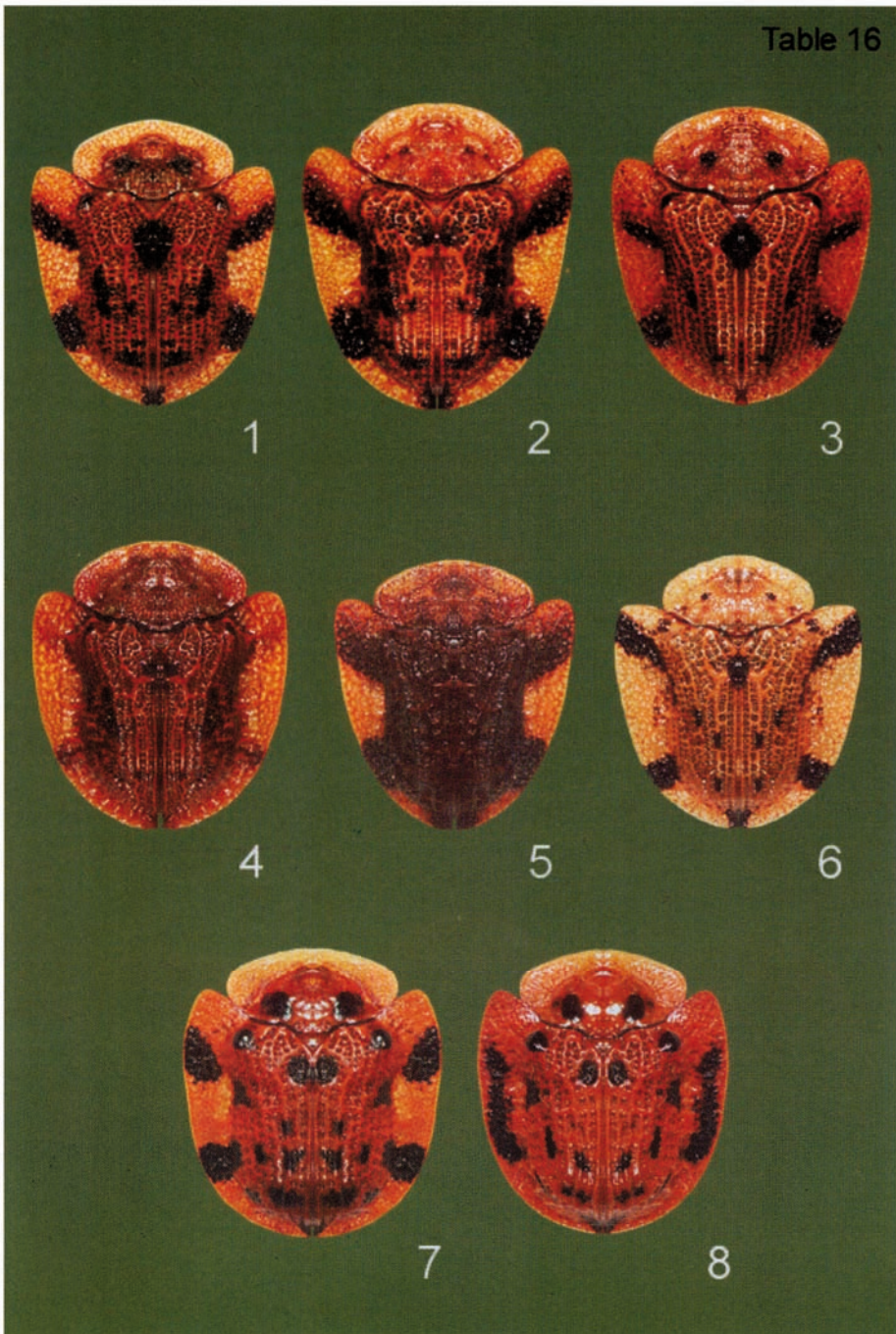


Table 16: 1-4. *Laccoptera nepalensis*; 5. *L. prominens*; 6. *L. fruhstorferi*;
7, 8. *L. fallax*

Table 17

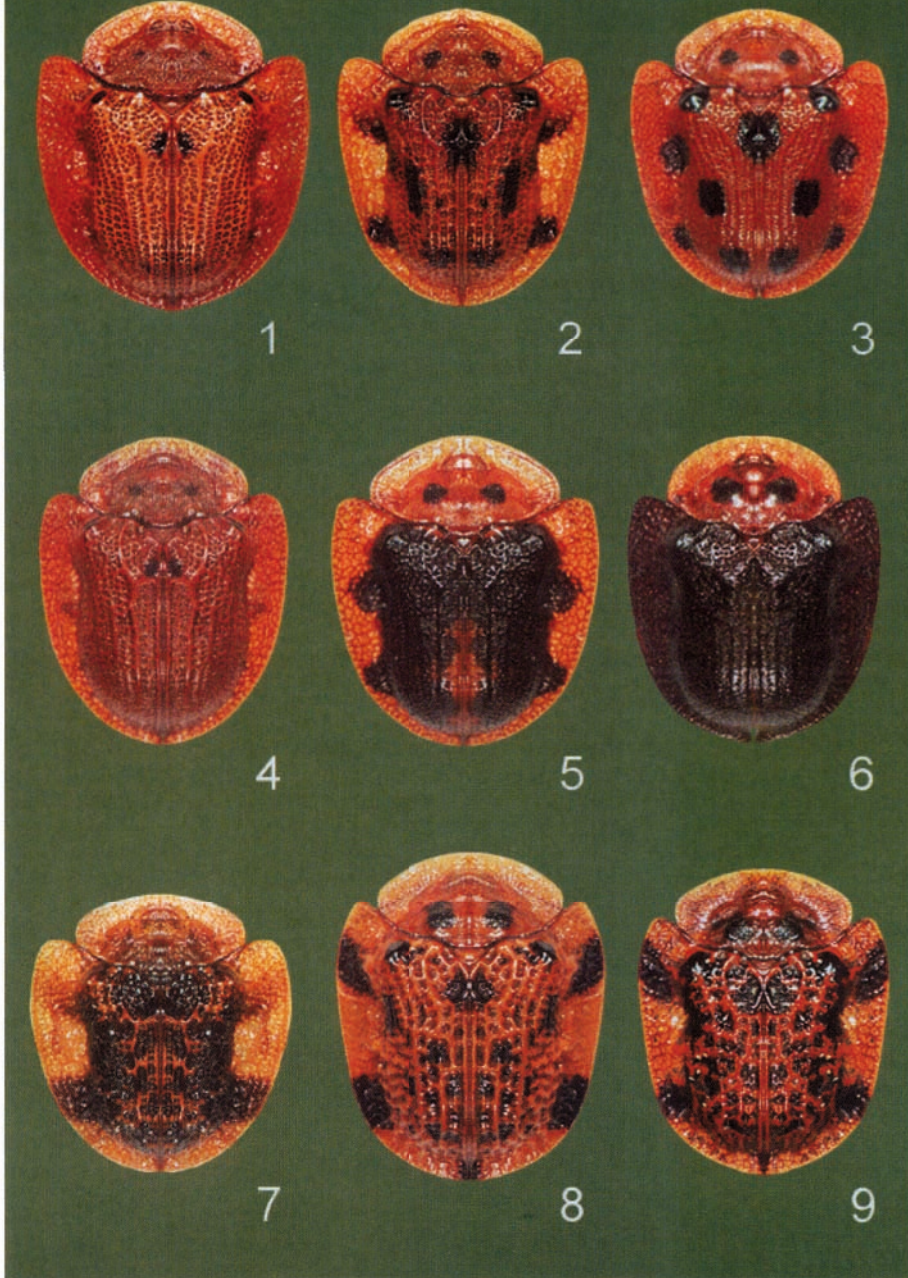


Table 17: 1, 2. *Laccoptera tredecimpunctata*; 3-6. *L. tredecimguttata*; 7. *L. cheni*;
8, 9. *L. permodica*

Table 18

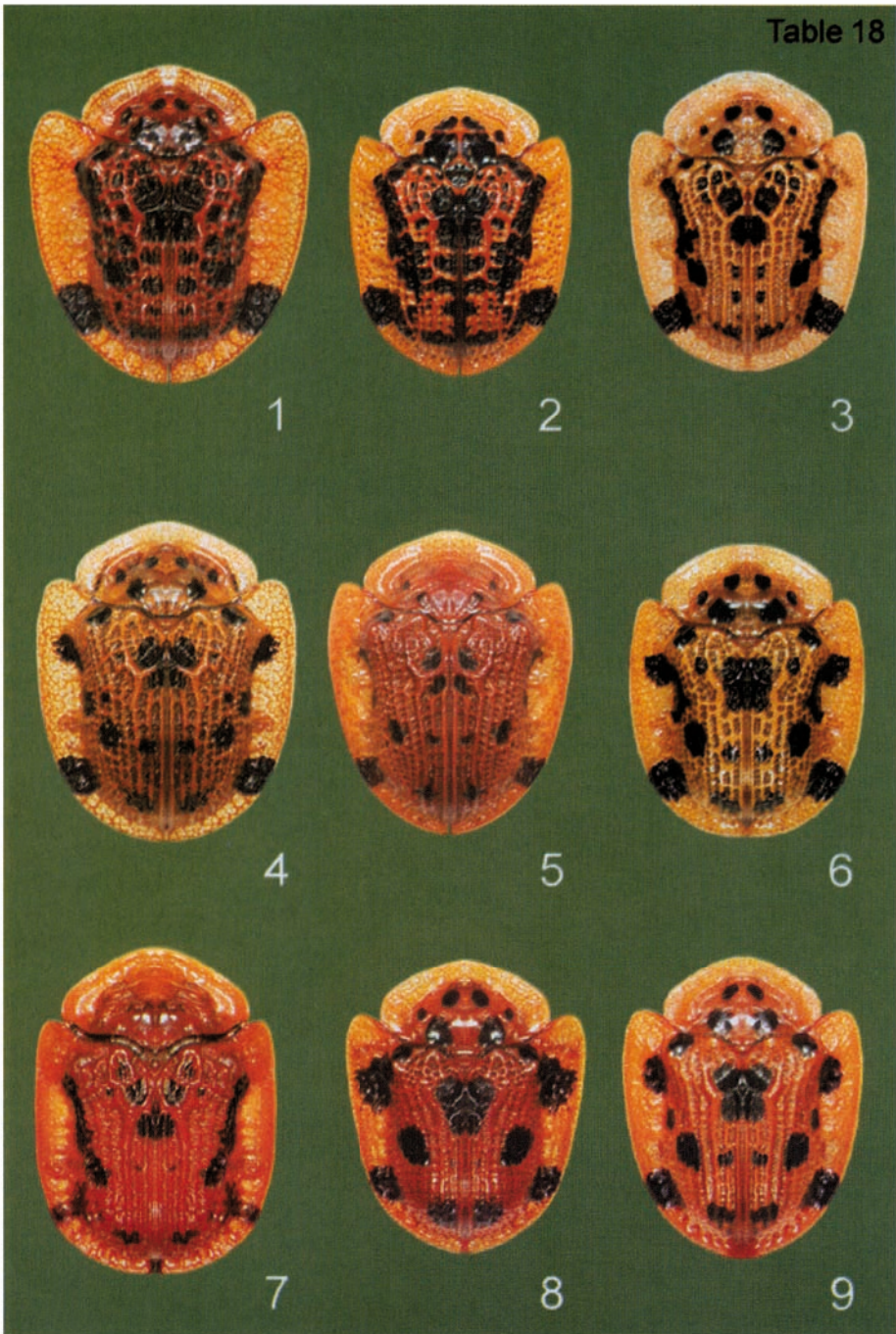


Table 18: 1, 2. *Laccoptera burmensis* (1 – male, 2 – female); 3. *L. hospita*;
4, 5. *L. vigintisexnotata*; 6. *L. nieghalayaensis*; 7. *L. parallelipennis*;
8. *L. multinotata*; 9. *L. novemdecimnotata*