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Revision of the Oriental genus *Borneosabahia* FRANZ (Coleoptera: Scydmaenidae)

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ABSTRACT. The Oriental genus *Borneosabahia* FRANZ, 1992 is revised; the type species *Borneosabahia mirifica* FRANZ, 1992 was found to be conspecific with *Euconnus malaysiae* FRANZ, 1984 which is herein transferred to *Borneosabahia*. Therefore, *B. mirifica* becomes a junior subjective synonym of *Borneosabahia malaysiae* (FRANZ, 1984) n. comb. *Euconnus malaysianus* FRANZ, 1990, a junior primary homonym of *E. malaysianus* FRANZ, 1984, is transferred to *Borneosabahia* and replaced by a new name, *Borneosabahia longipes* nom. n. Two new species are described, *B. dissimilis* n. sp. from Sabah, Borneo and *B. apion* n. sp., from Fraser's Hills, the Malay Peninsula. The genus is redefined, its general morphology is described and illustrated in detail, including aedeagi of all treated taxa, and the identification key to all species is given.

Key words: entomology, taxonomy, Coleoptera, Scydmaenidae, Cyrtoscydmini, *Borneosabahia*, new species, revision, Orient.

INTRODUCTION

The genus *Borneosabahia* (Scydmaeninae, Cyrtoscydmini) was established by FRANZ (1992) for a single species, *B. mirifica*, on the basis of numerous specimens from Mt. Kinabalu, Sabah, Borneo. Examination of FRANZ's papers revealed that at least two species earlier placed in *Euconnus* THOMSON might in fact belong to *Borneosabahia*; these are *E. malaysiae* FRANZ, 1984 and *E. malaysianus* FRANZ, 1990. The similarity of the specific epithets was a source of confusion and it was probably the reason for a homonymy discovered during the present study – *E. malaysianus* FRANZ, 1990 was preoccupied by *E. malaysianus* FRANZ, 1984. Examination of the type series of *Borneosabahia mirifica* revealed that the holotype and several paratypes were conspecific with *E. malaysiae* FRANZ,

1984, except for a single paratype, which was conspecific with *E. malaysianus* FRANZ, 1990. Although FRANZ has labeled all type specimens of *E. malaysianus* FRANZ, 1990 as *E. malaysiae* (sic!), they can be unambiguously identified as *E. malaysianus* on the basis of an accurate illustration of the aedeagus in the original description and label data. Specimens in the type series of *Euconnus malaysianus* FRANZ, 1984, turned out to belong to the "real" *Euconnus* and they do not pose further problems. The entire type series of *Borneosabahia mirifica* was labeled by FRANZ as "*Sabahia mirifica*"; this name has never been used in any published work. Another problem to be resolved was a significant difference in aedeagi of various specimens of "*B. mirifica*" illustrated in the original description (FRANZ 1992, figs. 37a-d). The aedeagus shown in Fig. 37b of that paper is distinctly different from that in the holotype male. The figure was based on a single specimen included in the type series of *B. mirifica* as a paratype. Since the illustration is accurate and the aedeagus clearly differs from copulatory organs of other paratypes, this male was easily identified amongst other specimens during the present study. It differs from the holotype not only in the aedeagus, but also in much smaller body and distinctly different proportions of antennomeres; this is undoubtedly a separate species.

An attempt to clarify the above mentioned taxonomical problems resulted in a comprehensive revision of the genus. *Borneosabahia*, thought very similar to the members of *Euconnus*, shows unique characters justifying its position as a separate genus. *Euconnus malaysiae* FRANZ, 1984 must be transferred to *Borneosabahia*; thus the name *B. mirifica* becomes a junior subjective synonym of *B. malaysiae* (FRANZ, 1984) comb. n. *Euconnus malaysianus* FRANZ, 1990, a junior primary homonym of *E. malaysianus* FRANZ, 1984, is transferred to *Borneosabahia* and replaced by a new name, *Borneosabahia longipes* nom. n. The single male misidentified by FRANZ as *B. mirifica* is described herein as *B. dissimilis* n. sp.; another new species from Fraser's Hills, Malaysia is described below as *B. apion* n. sp.

METHODS

The methodology used in the present study was adopted after JAŁOSZYŃSKI, 2004. Illustrated anatomical structures were disarticulated, dehydrated in isopropanol, transferred to xylene and mounted in Canada balsam, or dehydrated in ethanol and mounted in euparal. The measurements are as follows: the length of the head is from the narrowest place of the occipital constriction to the anterior margin of clypeus; the width maximum including eyes; the length of pronotum measured along midline; the length of elytra along the suture; the width of elytra combined, maximum; elytral index (EI): length/width; total body length is the sum of individual measurements of the head, pronotum and elytra. One to twenty specimens were measured, depending on the abundance of the material. The nomenclature of morphological details follows that used in JAŁOSZYŃSKI, 2004. The studied material is deposited in the National Science Museum, Tokyo (NSMT),

Natural History Museum, Vienna (NMW), Muséum d'histoire naturelle, Geneve (MHNG), private collection of the author (PCPJ), and private collection of Peter HLAVÁČ, Košice, Slovakia (PCPH).

TAXONOMY

Genus *Borneosabahia* FRANZ

Borneosabahia FRANZ, 1992: 893. Type species: *Borneosabahia mirifica* FRANZ (by original designation).

DIAGNOSIS

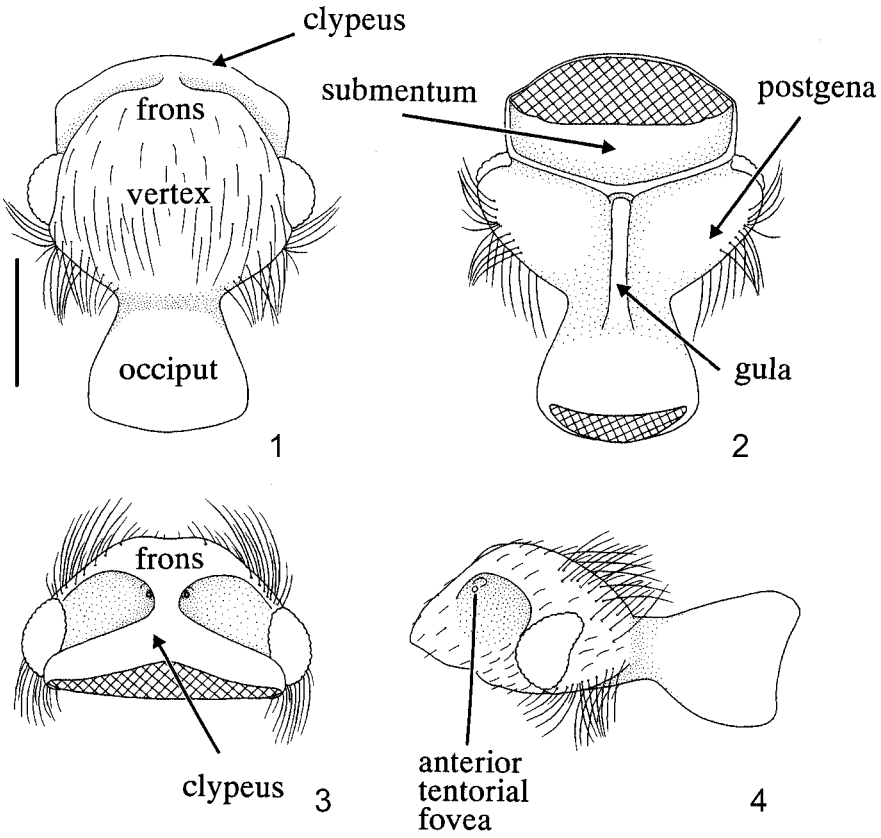
The genus can be distinguished from all other genera of the Cyrtoscydmini on the basis of the following set of characters: head with very large antennal cavities narrowly separated in middle; antenna without club, thickened toward apex, antennomere XI remarkably enlarged; maxillary palpomere IV very small, narrow and long; mandible long and slender, without prostheca, with one subapical tooth; neck narrow, about as wide as third of width of head; eyes large, semicircular; gena and subgena with long and thick erect setae; pronotum bell-shaped or subconical, widest near base, gradually narrowing anteriorly, much smaller than elytra, with moderately distinct, double lateral edge in posterior half or third, distinct subtriangular impression near each hind angle and ante-basal transverse groove or impression, sometimes interrupted in middle; elytra oval, very convex, each elytron with single large basal fovea not filled with setae; scutellum not visible; pro- and metacoxae contiguous, mesocoxae narrowly separated by thin and very high (i.e. strongly projecting ventrally) mesosternal carina which has two nearly circular vertical perforations or foramina and setal fringe along ventral margin; protrochanters with row of sparse, long and thick setae along ventral margin; aedeagus with large, bulbous median lobe, narrowing toward apex which is flattened dorso-ventrally and curved or bent ventrally, with longitudinal median groove on dorsal wall dividing aedeagus into lateral halves, parameres variously developed, free or partly fused with walls of median lobe, always with apical setae, internal armature complicated, composed of symmetrically distributed bunches of needle-like, dark sclerites; females externally not differing from males.

REDESCRIPTION

The detailed redescription of the general morphology is based on disarticulated male and female specimens of *B. longipes*. All other known species are extremely similar to that species and only small differences were found in the structures visible without complete disarticulation.

Head (Figs. 1-4) widest at eyes, strongly constricted between vertex and occiput. Neck well visible in natural position, as broad as about third of head

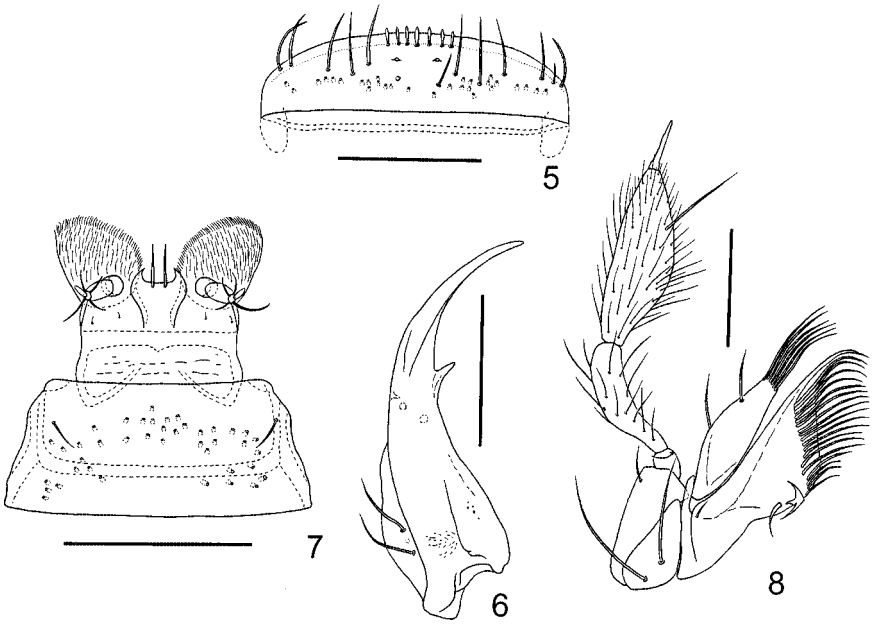
width; tempora long, strongly convergent, rounded; vertex broad and convex, gradually rising from occipital constriction up to frons; frons steeply lowering toward large and broad clypeus, clypeal suture missing; supraantennal tubercles relatively weakly marked; eyes large, very convex, in lateral view nearly semicircular, elongate dorso-ventrally, with slightly emarginate posterior margin; antennal cavities very large, narrowly separated in middle; antennal insertions approximate, located on anterior part of head, near internal margins of antennal cavities. Ventral surface of head distinctly flattened or slightly concave; gena and postgena prominent, convex; gular plate very narrow and long, sharply delimited anteriorly and laterally but with indistinct posterior margin, located in median impression; submentum large and broad. Anterior tentorial foveae located near antennal insertions, inside antennal cavities; posterior tentorial foveae not marked. Head with sparse, variously distinct punctation; setation rather sparse, long to very



1-4. *Borneosabahia longipes* JAŁOSZYŃSKI. 1 – head in dorsal view (mouthparts omitted); 2 – head in ventral view; 3 – head in anterior view; 4 – head in lateral view (scale bar – 0.2 mm)

long, erect, with very characteristic groups of setae on gena and postgena directed ventrally and laterally, and sparse setae on sides of vertex directed dorsally, posteriorly and toward middle. Antennae (Figs. 29-32) moderately long, strongly but gradually thickening toward apex, antennomere XI strongly enlarged, ovoid, slightly or distinctly asymmetrical.

Mouthparts (Figs. 5-8). Labrum (Fig. 5) very broad and short, about 3.5x as wide as long in middle, with broadly rounded anterior margin, dorsal surface bears several nearly symmetrically distributed long erect setae, additional row of several short setae (each broadened near apical third) in middle part of anterior margin, and numerous small, circular or oval pores. Mandible (Fig. 6) subtriangular, nearly planar, long and slender, with broad base, curved and sharp apical tooth and single subapical tooth; external margin of mandible near posterior condyle bears two or three long setae; prostheca missing. Labium (Fig. 7) with darkly sclerotized, subtrapezoidal mentum with pair of relatively short setae and numerous small pores on ventral surface, palpi labiale very small and inserted at nearly straight angle to ventral surface of labium, palpomere I short, subcylindrical and asetose, only slightly longer than wide, palpomere II subcylindrical, nearly twice as long as I, with four long erect setae near apex, palpomere III small, slender, fusiform and asetose. Anterior margin of labium with pair of long straight bristles; hypopharynx well developed, with dense short setae. Maxilla (Fig. 8) with

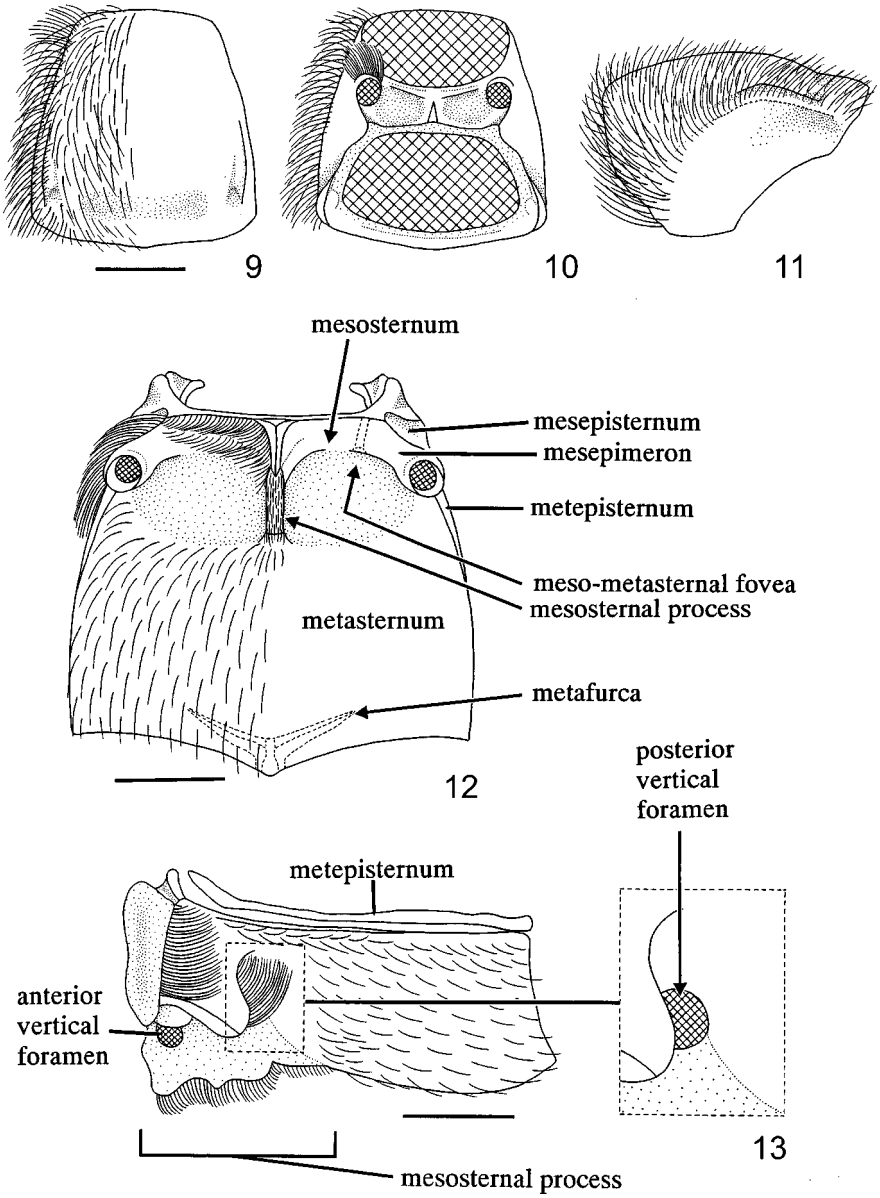


5-8. *Borneosabahia longipes* JAŁOSZYŃSKI. 5 – labrum in dorsal view; 6 – left mandible in dorsal view; 7 – labium in ventral view; 8 – right maxilla in ventral view (scale bars – 0.1 mm)

subtriangular stipes bearing two long setae near base; elongate palpifer with one relatively short seta near apex; elongate galea with row of long and dense setae along internal apical margin and additionally two shorter setae on apex and on external margin; and long lacinia with dense and long setae along internal margin and two additional thick setae near base of setose part of internal margin, one of them has peculiar shape. Palpus maxillaris moderately large, palpomere I very small, subtrapezoidal, with single seta near apex; II elongate and curved, gradually broadening from base to middle, then nearly cylindrical up to apex, covered with relatively sparse, suberect setae; palpomere III distinctly enlarged, broadened near middle, with expanded internal margin, flattened dorso-ventrally, with moderately dense, suberect setation, internal margin with additional single, long and nearly straight thick seta; palpomere IV very slender, irregularly narrowing from base to pointed apex, asetose.

Prothorax (Figs. 9-11, 25-28). In dorsal view (Fig. 9, 25-28), pronotum elongate, subconical or bell-shaped, widest near posterior third or at base. Anterior margin only slightly rounded, delimited from lateral margins by blunt and obtuse anterior angles; lateral margins broadly rounded, in posterior third with relatively indistinct double edge (least distinct in *B. dissimilis*), with continuous upper carina and bottom line composed of tiny tubercles, gradually disappearing anteriorly; basal margin arcuate, slightly expanded posteriorly in middle, hind angles distinct but blunt, obtuse. Pronotum with moderately deep subtriangular impression or pit near each hind angle and transverse impression or groove between lateral pits. In *B. longipes* (Fig. 27) groove is shallow and diffused, less shallow in middle but not interrupted, with indistinct fovea at each end; in *B. dissimilis* (Fig. 28) groove is slightly expanded anteriorly in middle; in *B. malaysiae* (Fig. 25) groove interrupted in middle by distinct short carina; in *B. apion* (Fig. 26) very small median area posteriorly adjacent to groove slightly raised, but groove is not interrupted. Dorsal surface of pronotum moderately convex, covered with fine and sparse punctures and long, moderately dense to very dense setation composed of thin, curved, erect setae. Ventral side of pronotum (Fig. 10) very short, with narrow basisternal area; procoxal cavities large, transversely oval, procoxal insertions very widely separated; subcoxal foveae not found. Hypomera large and not demarcated from epimera and sides of pronotum, elongate. Ventral surface of pronotum without setation, except for long, dense and erect setae anterior to each procoxal insertion.

Mesothorax (Figs. 12-13, 15). Mesonotum (Fig. 15) short and broad; prescutellum bilobate, with deep, rounded median emargination in anterior margin, posterior margin rounded, each lateral margin terminated at short and relatively broad anterior notal wing process; scutellum relatively short, subtriangular with rounded posterior margin; postscutellum very short, with broadly emarginate posterior margin; posterior notal wing processes long and very slender, extending laterally toward antero-lateral margins of metatergal prescutum. Mesosternum (Fig. 12) wider than long; mesepimeron elongate, convex; mesepisternum elon-



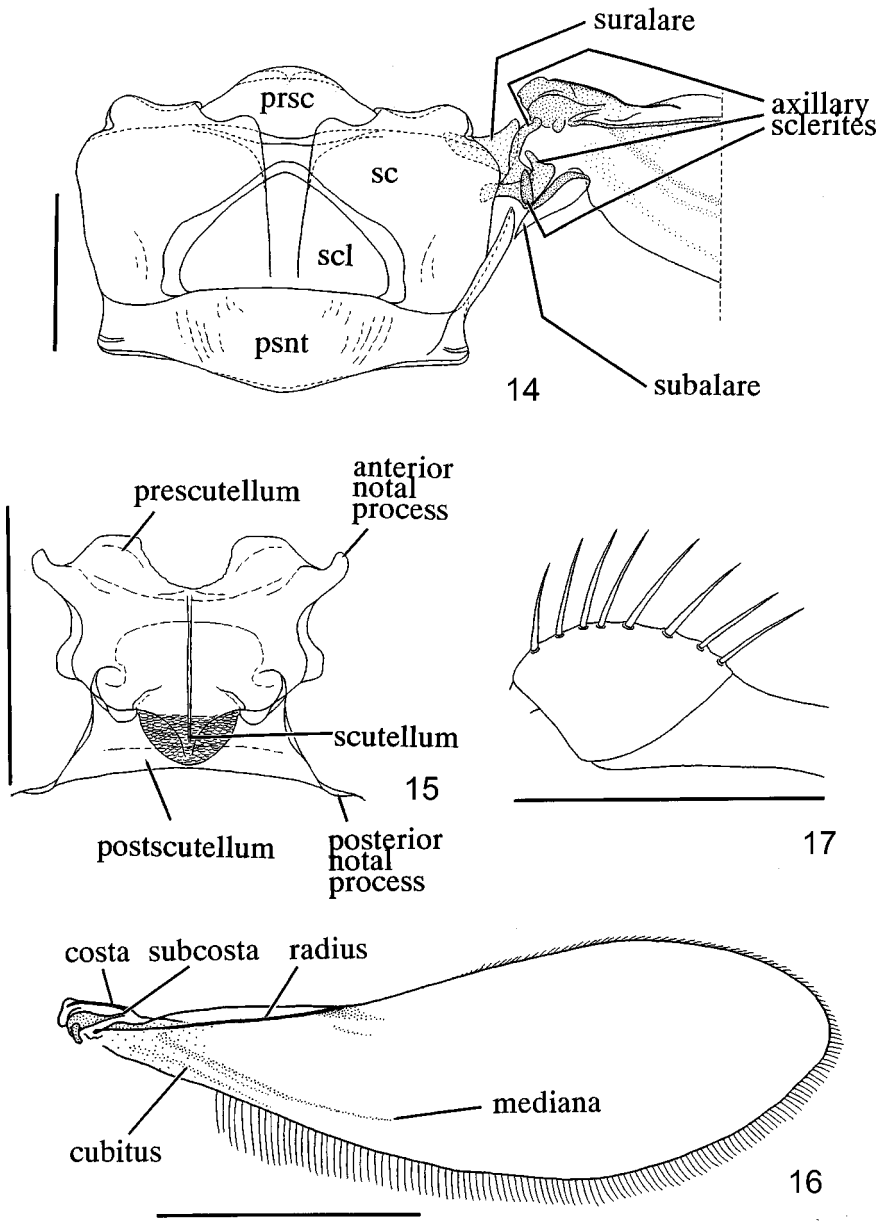
9-13. *Borneosabahia longipes* JAŁOSZYŃSKI. 9 – pronotum in dorsal view; 10 – pronotum in ventral view; 11 – pronotum in lateral view; 12 – meso- and metasterna in ventral view; 13 – meso- and metasterna in lateral view (in frame magnified part with omitted setation) (scale bars – 0.2 mm)

gate, slightly concave, in non-disarticulated specimens partly visible in dorsal view; basisternal area short, posteriorly basisternum expanded in middle into raised, narrow mesosternal carina or process with complicated shape of ventral margin (Fig. 13) bearing long, erect setae directed ventrally and slightly posteriorly, carina with two vertical perforations or foramina, posterior one hidden under dense setation of posterior margins of epimera (Fig. 13, magnified in frame). Coxal insertions small, nearly circular, very broadly separated. Surface of basisternal area uneven, with long and dense setae; mesepisterna asetose; mesepimera in lateral view with long and dense setae on posterior margin.

Metathorax (Fig. 12-13, 14). Metanotum (Fig. 14) distinctly wider than long; prescutum relatively small, transverse, with regularly rounded posterior margin, distinctly demarcated from scutum, laterally connected to wing insertion, posterolaterally to scutum; scutum large, nearly completely divided into two lateral parts by large, triangular scutellum, distinctly separated from scutum and from postnotum by sutures; postnotum moderately long, with convex, rounded posterior margin. Metasternum (Fig. 12-13) about as long as wide, basisternal area with biemarginate anterior margin, deeply impressed between mesosternal process and mesocoxal insertions; meso-metasternal foveae located between meso- and metasternum small, in natural position covered by mesocoxae; middle part of anterior margin fused to mesosternal process; posterior 3/4 of metasternum convex; posterior margin shallowly biemarginate, expanded posteriorly in middle; metasternum bordered on each side by very narrow episternum. Metasternum with very fine and sparse punctation; setation moderately long, sparse, recumbent to suberect, except for asetose areas under mesocoxae. Metafurca with short and broad basal stalk and two moderately long, subtriangular, nearly straight and widely divergent furcal arms.

Elytra (Fig. 24) entire, oval, very convex, with nearly straight or slightly concave base and rounded apices; humeral calli barely marked, not accompanied by internal humeral impression; each elytron bears single, moderately large, circular basal fovea not filled with setae, well visible in natural position. Scutellum not visible. Elytral punctation not ordered in rows, punctures relatively fine and sparse; elytral setation composed of long, suberect to erect setae.

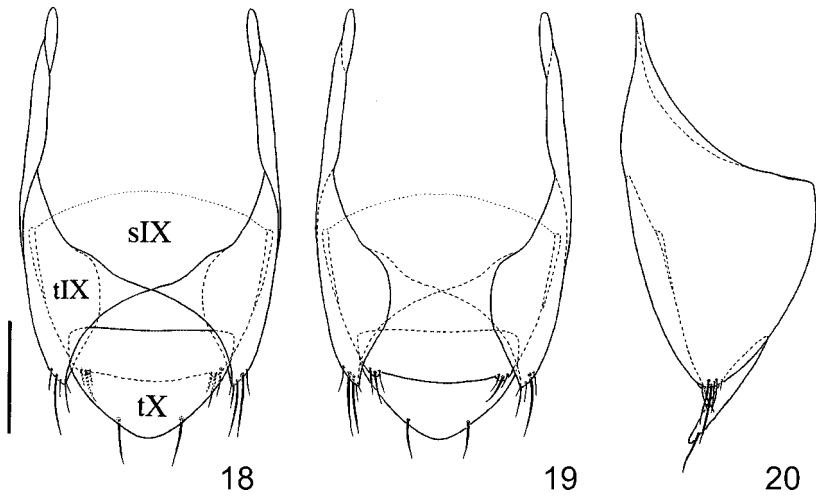
Wing insertion and wing (Figs. 14, 16). Suralare large, subtriangular with concave anterior margin; axillary sclerites moderately large, elongate, uppermost (anterior) sclerite large and long, inversely hammer-shaped, middle sclerite similarly large, irregular in shape, bottom (posterior) sclerite small, oval; subalare subtriangular, large and elongate, with rounded sides. Wings (Fig. 16) in all species fully developed, about twice as long as elytra or longer. Wing venation highly reduced, limited to about basal third of wing; costa and subcosta very short, barely recognizable; radius relatively long, distally fused to anterior margin of wing; posterior venation composed of only two nearly parallel, relatively lightly sclerotized veins, which may represent mediana and cubitus. Distal half of wing without traces of veins, posterior margin with dense and long setal fringe, anterior



14-17. *Borneosabahia longipes* JAŁOSZYŃSKI. 14 – metanotum and wing insertion in dorsal view (prsc – prescutum; sc – scutum; scl – scutellum; psnt – postnotum); 15 – mesonotum in dorsal view; 16 – right wing in dorsal view; 17 – right protrochanter in postero-ventral view (scale bars: 14, 15, 17 – 0.2 mm, 16 – 1 mm)

margin with very short setae, entire surface of wing covered with extremely short, very dense setation (not shown in Fig. 16).

Legs (Figs. 17, 24) very long and slender (*B. longipes*) or rather short and robust (remaining species). Procoxae contiguous, subconical, strongly projecting ventrally, with sparse, short setae; mesocoxae transversely oval, larger than procoxae, narrowly separated by mesosternal process, with dense, moderately long setae along posterior margin; metacoxae contiguous, with larger transverse, drop-shaped part and separated elongate part adjacent to trochanter, with sparse and short setation. Protrochanters (Fig. 17) fully separating femur from coxa, large, oval and flattened laterally, with row of several long and thick erect setae along anterior (ventral) margin; mesotrochanters not separating femur from coxa, as long as protrochanters but slightly more slender, drop-shaped, with pointed distal end, covered with short and thin, recumbent to suberect, moderately dense setae; metatrochanters not separating femur from coxa, similar in shape to mesotrochanters but larger and yet more slender, with moderately dense, relatively long, thin erect setae directed posteriorly and toward distal end of trochanter. Femora with slender, stalk-like basal third (profemur) half (mesofemur) or slightly more than half (metafemur) and strongly, but not abruptly clavate distal part, all femora covered with moderately dense and long suberect setae. Tibiae slender; in all species protibia recurved and relatively short, meso- and metatibia slightly curved or straight; mesotibiae with dense setal patch in distal part of internal margin (usually 1/3-1/4 of length of tibia), best marked in *B. longipes*, barely noticeable in *B. dissimilis*. Tarsi slender, relatively long, in all species



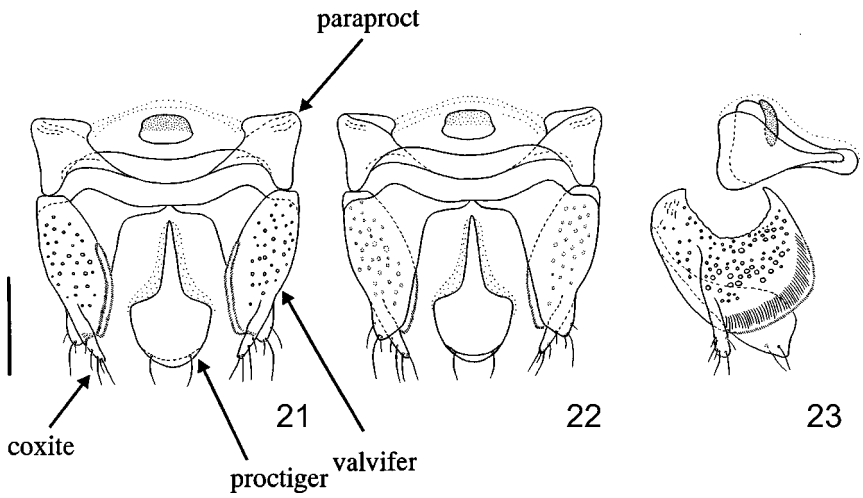
18-20. *Borneosabahia longipes* JAŁOSZYŃSKI. 18 – male genital segment in dorsal view (sIX – sternite IX; tIX – tergite IX; tX – tergite X); 19 – male genital segment in ventral view; 20 – male genital segment in lateral view (scale bar – 0.1 mm)

protarsi shortest and metatarsi longest, tarsomeres I-II subequal in length and width, tarsomeres II-IV gradually reducing in length and width, tarsomere V as long as III-IV together or slightly shorter; tarsi with short, moderately dense, recumbent and suberect setae.

Abdominal sternites. Six abdominal sternites visible (numbered I-VI in the present study), together as long as or shorter than metasternum. Sternite I only partly visible from under metacoxae, sternites II-IV subequal in length, each slightly shorter than I; sternite V about as long as 1.5 length of IV, sternite VI subtriangular, only as long as 1/3 length of V, with broadly rounded posterior margin; sutures between sternites arcuate; all sternites with variable, rather sparse and fine punctation; setation composed of moderately dense and long, suberect and erect setae.

Male genital segment (Figs. 18-20) composed of tergite IX, sternite IX and tergite X. Tergite IX divided into elongate lateral parts, each bearing group of setae on posterior apex; sternite IX relatively large, subtriangular, with broadly rounded, lightly sclerotized, hymenous anterior margin, weakly rounded posterior margin and pair of postero-lateral expansions or lobes separating sides from posterior margin, each lobe bears three moderately long setae; tergite X moderately large, subtriangular with rounded posterior margin bearing pair of widely separated long setae.

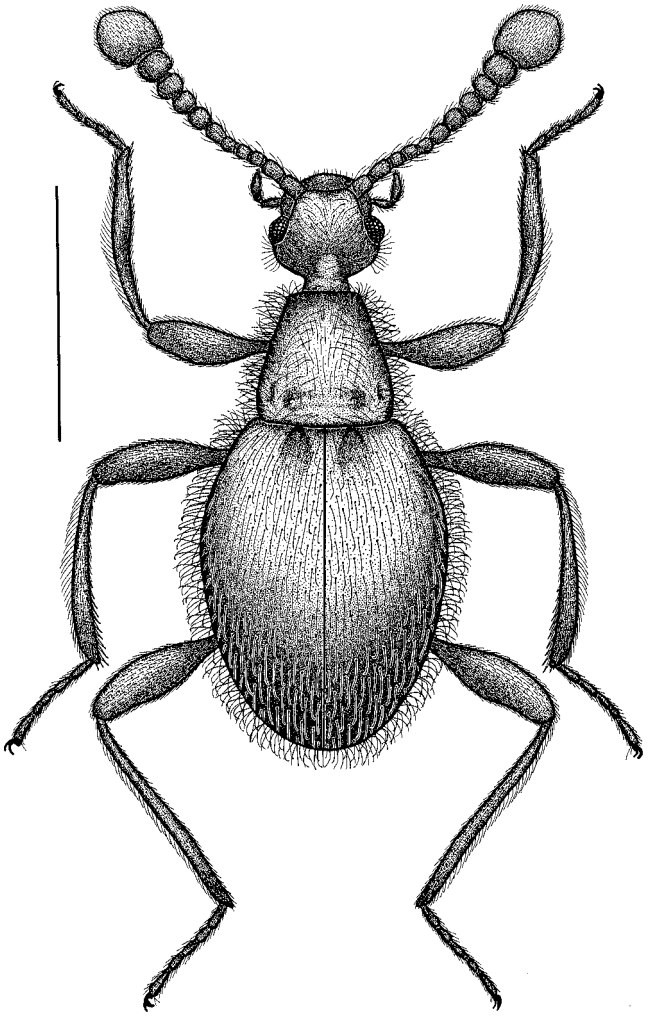
Aedeagus (Figs. 33-37, 39-47) with large, bulbous median lobe, narrowing toward apex which is flattened dorso-ventrally and curved ventrally, base of aedeagus with median emargination well visible in dorso-ventral view, dorsal wall of median lobe partly divided into lateral halves by longitudinal median groove



21-23. *Borneosabahia longipes* JAŁOSZYŃSKI. 21 – female genital segment in dorsal view; 22 – female genital segment in ventral view; 23 – female genital segment in lateral view (scale bar – 0.1 mm)

(indistinctly in *B. dissimilis*); parameres variously developed, free or partly fused with walls of median lobe, always with apical setae; internal armature complicated, composed of symmetrically distributed bunches of thin and long, needle-like dark sclerites.

Female genital segment (Figs. 21-23) composed of pair of small, fused paraprocts with additional single dark plate in middle surrounded by very lightly sclerotized hymenous structures; pair of moderately broad valvifers completely separated from paraprocts, with dense setation along apical margins and each with additional three long setae on posterior apex, covered with microsculpture com-



24. *Borneosabahia longipes* JAŁOSZYŃSKI, male habitus (scale bar – 1 mm)

posed of dense circular structures (pores?); pair of relatively small, elongate, slender coxites with several moderately long setae; and small proctiger with rounded posterior margin bearing pair of long, widely separated apical setae, and with slender and pointed median projection in distal margin. Bursa copulatrix not found.

Spermatheca. Vesicular spermatheca typical of some genera of the Cyrtoscydmini not found; in females of all species a uniformly shaped, lightly sclerotized, nearly globular structure was found in abdomen (Fig. 38), not present in males. However, homology of this structure with spermatheca is not certain.

KEY TO *BORNEOSABAHIA* FRANZ

1. Antennomere XI over 1.5x as long as wide ..... ***B. dissimilis* n. sp.**
-. Antennomere XI as long as wide or only minimally longer ..... 2.
2. Ante-basal groove on pronotum not connecting lateral impressions, with additional pit or impression on each end; legs very long and slender; body length 2.12-2.26 mm ..... ***B. longipes* nom. n.**
-. Each end of ante-basal groove very close to or connected with lateral impression, without additional pit; legs relatively short; body in most cases below 2 mm, rarely up to 2.05 mm ..... 3.
3. Elytra widest at middle or slightly posterior to middle; ante-basal groove on pronotum interrupted in middle by short, but distinct longitudinal carina; body larger, 1.78-2.05 mm; parameres free, not fused with median lobe .... ***B. malaysiae* (FRANZ)**
-. Elytra widest anterior to middle; ante-basal groove posteriorly in middle with very small and indistinct raised area, but not interrupted, or interrupted very indistinctly; body smaller, 1.61-1.8 mm; parameres partly fused with median lobe ..... ***B. apion* n. sp.**

Borneosabahia malaysiae (FRANZ) n. comb.

(Figs. 25, 29, 33-38)

Euconnus malaysiae FRANZ, 1984: 97, fig. 5.
Borneosabahia mirifica FRANZ, 1992:893, fig. 37a-d, **n. syn.**

DIAGNOSIS

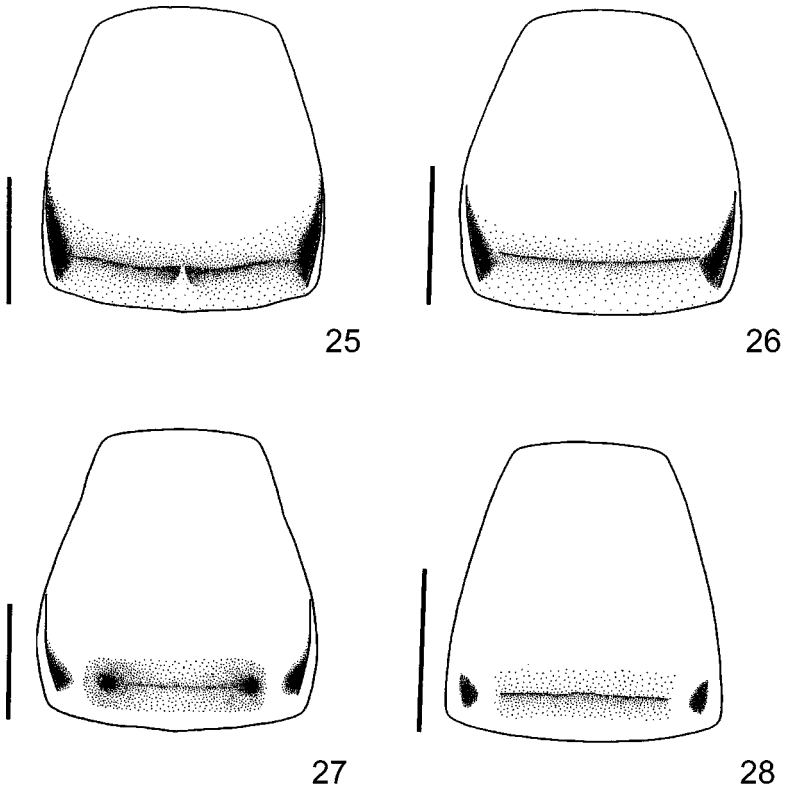
This species can be distinguished from its congeners on the basis of short, very distinct median carina interrupting ante-basal groove on pronotum.

REDESCRIPTION

Male. Body length 1.78-1.99 mm (mean 1.92 mm), pigmentation moderately dark brown, legs and palpi slightly lighter, setation yellowish to light brown. Head

about as long as wide, widest at eyes, length 0.31-0.39 mm (mean 0.37 mm), width 0.31-0.4 mm (mean 0.36 mm). Tempora long, moderately strongly convergent, rounded; vertex only slightly broader than long, subtrapezoidal, convex; frons relatively small, steeply lowering toward clypeus; supraantennal tubercles relatively indistinct. Punctation sparse and fine; setation moderately dense, setae on frons and anterior third of vertex relatively short, suberect to erect, on posterior part of vertex very long, directed dorsally and posteriorly, gena and postgena with row of very long, dense, thick and curved setae, usually distinctly divided into two groups directed latero-ventrally and anteriorly and latero-ventrally and posteriorly. Antenna as in Fig. 29, length 0.75-0.82 mm (mean 0.79 mm).

Pronotum (Fig. 25) in dorsal view bell-shaped, widest near posterior third, narrowing toward anterior margin, length 0.47-0.51 mm (mean 0.49 mm), width 0.45-0.46 mm (mean 0.45 mm). Base with elongate subtriangular lateral impressions and transverse impression interrupted in middle by distinct longitudinal carina. Punctation sparse and fine; setation moderately dense, very long, erect,



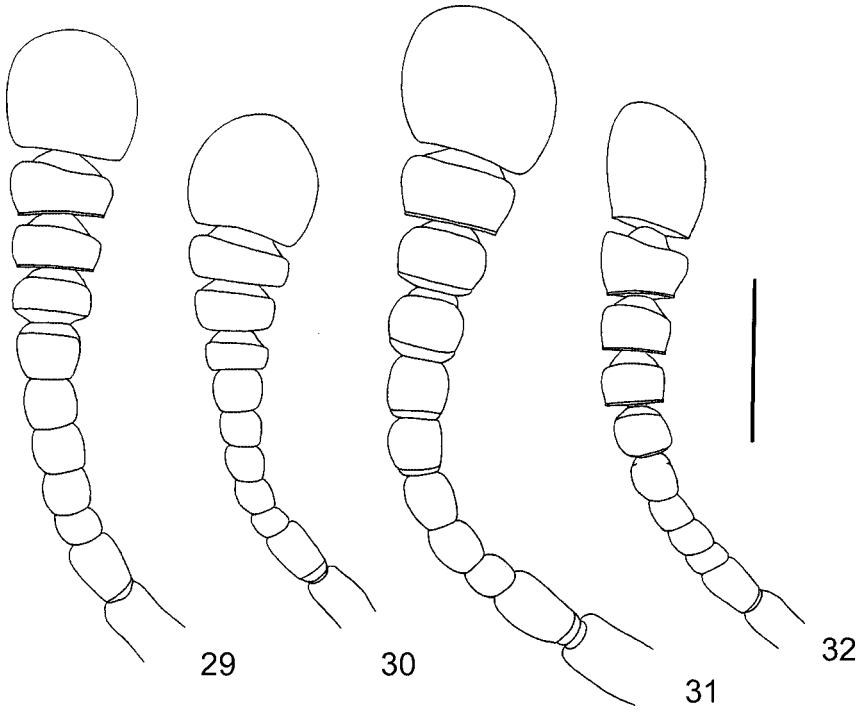
25-28. Simplified outline of pronotum in dorsal view. 25 – *B. malaysiae* (FRANZ); 26 – *B. apion* JAŁOSZYŃSKI; 27 – *B. longipes* JAŁOSZYŃSKI; 28 – *B. dissimilis* JAŁOSZYŃSKI (scale bar – 0.2 mm)

setae along lateral margins particularly dense, directed dorso-laterally and slightly posteriorly, only slightly curved; setae on median part of disc sparser, strongly curved, directed dorsally and toward middle line; setae in posterior half of disc additionally directed slightly posteriorly; narrow area between lateral margin and lateral ante-basal pit with dense row of erect setae directed laterally and slightly posteriorly.

Elytra oval, elongate, about twice as long as pronotum, widest at middle or slightly posterior to middle, length 1.00-1.09 mm (mean 1.06 mm), width 0.74-0.81 mm (mean 0.77 mm), EI 1.34-1.35. Each elytron with large and deep basal fovea located in middle between humerus and suture; apices of elytra separately rounded; punctation very fine, sparse; setation dense, setae distinctly thinner than those on pronotum, long, erect, slightly curved.

Legs relatively short, robust; metafemora more slender than mesofemora; protibiae recurved, metatibiae slightly (sometimes minimally) longer than mesotibiae.

Aedeagus (Fig. 33-37) 0.27 mm in length, in dorso-ventral view oval, with delimited apical part; in lateral view apex curved ventrally; parameres not fused to



29-32. Left antenna of male in dorsal view. 29 – *Borneosabahia malaysiae* (FRANZ); 30 – *B. apion* JAŁOSZYŃSKI; 31 – *B. longipes* JAŁOSZYŃSKI; 32 – *B. dissimilis* JAŁOSZYŃSKI (scale bar – 0.2 mm)

median lobe, not reaching apex of aedeagus, with two apical setae (in some specimens one seta). Median lobe is lightly sclerotized and relatively fragile; a high degree of variability in the general shape observed among studied specimens is due to distortions caused by preparation conditions. Especially internal sclerites of endophallus seem to change their arrangement during drying and relaxing specimens; figures 33-37 show extreme cases of variation. In most studied males internal sclerites are arranged as those in Fig. 37 (see remarks).

Female. Very similar to male, differs only in larger body and broader elytra. Body length 1.89-2.05 mm (mean 1.95 mm), length of head 0.35-0.40 mm (mean 0.38 mm), width of head 0.36-0.40 mm (mean 0.37 mm), length of antenna 0.75-0.80 mm (mean 0.77 mm), length of pronotum 0.50-0.60 mm (mean 0.50 mm), maximum width of pronotum 0.45-0.47 mm (mean 0.46 mm), length of elytra 1.04-1.15 mm (mean 1.07 mm), width of elytra 0.80-0.90 mm (mean 0.84 mm), EI 1.28-1.30.

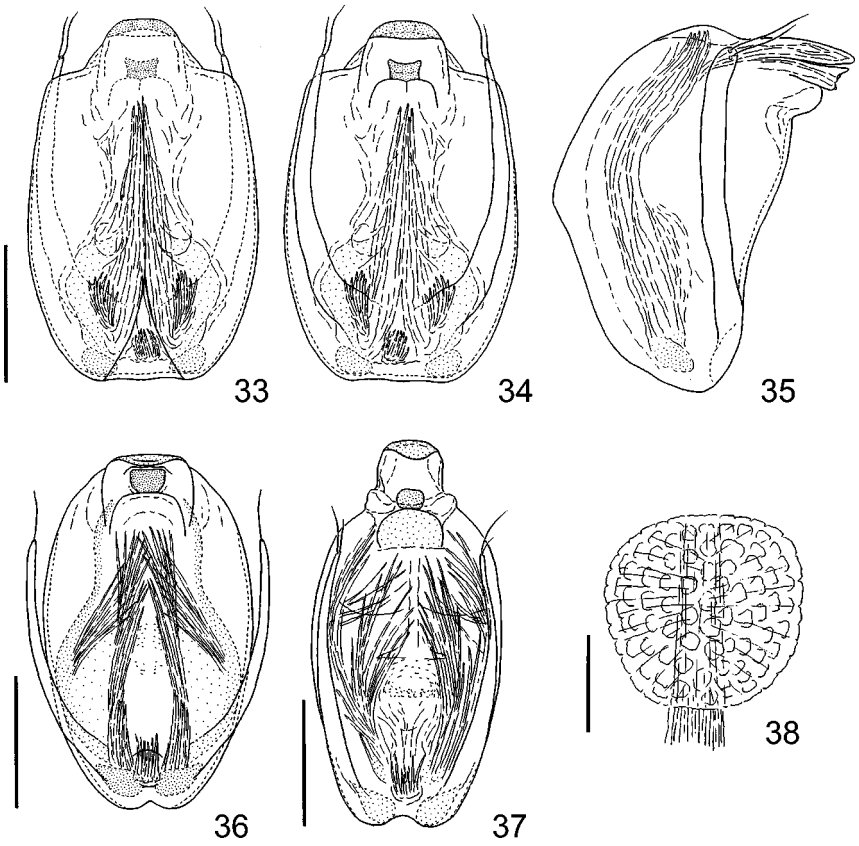
TYPE MATERIAL

Holotype (male): white printed label "Malaysia, Cameron Hlds, 22-30. III, 1984, Rougemont", white handwritten label "Euconnus malaysiae m." and printed "det. H. Franz", and red handwritten label "Holotypus" (NMW). Paratypes: 1 ex., same data, but with yellow handwritten label "Euconnus malaysiae m." and printed "PARATYPUS" (NMW).

ADDITIONAL MATERIAL STUDIED

1 ♂, white printed label "SABAH, Mt. Kinabalu, 1550 m, 29. IV. 1987, Burckhardt-Löbl", red handwritten label "Holotypus", white handwritten label "Sabahia [sic!] mirifica m." and printed "det. H. Franz" (MHNG); 1 ex., same data except for yellow handwritten label "Sabahia mirifica m." and printed "PARATYPUS" (MHNG); 1 ex., same data but "24. IV. 1987, 1550-1650 m" (MHNG); 1 ex., same data but "25. IV. 1987, 1500 m" (as paratype of *B. mirifica*) (NMW); 2 exx., same data but "27. IV. 1987, 1580 m" (as paratypes of *B. mirifica*) (MHNG); 2 exx., same data but "21. V. 1987" and "1500 m" (as paratypes of *B. mirifica*) (MHNG); 1 ex., same data except for "22. V. 1987, 1430 m" (as paratype of *B. mirifica* (MHNG); 1 ex., same data but "23. V. 1987, 1450-1550 m" (as paratype of *B. mirifica*) (NMW); 4 exx., white printed label "SABAH: Crocker Range, 1550-1650 m, 16. V. 1987, Burckhardt-Löbl" (two exx. with additional symbol "27a", as paratypes of *B. mirifica*; 2 exx. in MHNG, 2 in NMW); 1 ex., white printed label "SABAH: Crocker Ra., 1270 m, km 60 rte [road] Kota Kinabalu – Tambunan, 17. V. 87, Burckhardt- Burckhardt-Löbl" (as paratype of *B. mirifica*) (NMW); 2 exx., same data except for "1600 m, km 51 rte Kota Kinabalu – Tambunan, 18. V. 87, Burckhardt-Löbl" (as paratypes of *B. mirifica*) (MHNG); 28 exx., Sabah, Crocker Range, 1550-1650 m, 16. v. 1987, BURCKHARDT & LÖBL leg. (12 in NMW, 16 in MHNG); 2 exx., same data except for 1600 m, 18. v. 1987 (MHNG); 2 exx., Sabah, Kibongol V., 7 km N Tambunan, 700 m, 20. v. 1987, BURCKHARDT & LÖBL leg. (MHNG); 1 ex., Sabah, Poring Hot

Springs, 500 m, 6. v. 1987, BURCKHARDT & LÖBL leg. (MHNG); 24 exx., Sabah, Mt. Kinabalu, 1550 m, 23. iv. 1987 BURCKHARDT & LÖBL leg. (MHNG); 13 exx., same data except for 1550-1650 m, 24. iv. 1987 (1 in NMW, 12 in MHNG); 16 exx., same data except for 1500 m, 25. iv. 1987, (3 in NMW, 13 in MHNG); 6 exx., same data except for 1580 m, 27. iv. 1987 (2 in NMW, 4 in MHNG); 5 exx., same data except for 1750 m (1 in NMW, 4 in MHNG); 7 exx., same data except for 1450-1550 m, 28. iv. 1987 (MHNG); 14 exx., same data except for 1550 m, 29. iv. 1987 (MHNG); 17 exx., same data except for 1500 m, 21. v. 1987 (MHNG); 3 exx., same data except for 1430 m, 22. v. 1987 (MHNG); 8 exx., same data except for 1450-1550 m, 23. v. 1987 (1 in NMW, 7 in MHNG); 18 exx., Sabah, Crocker Range, 1600 m, 51st km road Kota Kinabalu – Tambunan, 18. v. 1987, BURCKHARDT & LÖBL leg. (1 in NMW, 17 in MHNG); 3 exx., same data



33-38. *Borneosabahia malaysiae* (FRANZ). 33-35 – aedeagus of the holotype in dorsal (33), ventral (34) and lateral (35) views; 36-37 – variability in the shape of aedeagus in non-type males (ventral view); 38 – spermatheca ? (scale bars – 0.1 mm)

except for 1270 m, 60th km, 17. v. 1987 (MHNG); 4 exx., same data except for 1350 m (MHNG); 1 ex., Kinabalu National Park Headquarters, at Liwagu River, 1500 m, 25. iv. 1987, A. SMETANA leg. (NMW); 1 ex., same data except for 1500-1550 m, 27. iv. 1987 (MHNG); 1 ex., same data except for 1500 m, 16. v. 1987 (MHNG); 8 exx., same data except for 1490 m, 18. v. 1987 (MHNG); 1 ex., same data except for 1490 m, 5. viii. 1988 (MHNG); 3 exx., same data except for 1490 m, 10. viii. 1988 (MHNG); 7 exx., same data except for 1500 m, 1. ix. 1988 (MHNG); 2 exx., same data except for 1505 m, 2. ix. 1988 (NMW, MHNG); 3 exx., same data except for 3. ix. 1988 (MHNG); 3 exx., Kinabalu National Park Headquarters, 1560 m, 23. iv. 1987, A. SMETANA leg. (MHNG); 2 exx., same data except for 1560-1660 m, 24. iv. 1987 (MHNG); 2 exx., same data except for Silau-Silau, 1550 m, 2. ix. 1988 (MHNG); 57 exx., Sabah, Gunung Emas Resort, 52nd km at road Kita Kinabalu – Tambunan, 23.-29. v. 1998, P. HLAVÁČ leg. (PCPH, PCPJ); 2 exx., Sabah, Mewar Waterfall, near Patau village, 30.-31. v. 1998, P. HLAVÁČ leg. (PCPH); 1 ex., Sabah, Gunung Emas, Sinsuran waterfall, 10. vi. 1996, KODADA & ČIAMPOR leg. (PCPH); 2 exx., Kinabalu National Park Headquaters, 1500 m, 19. iii. 1993, T. UENO leg. (NSMT).

DISTRIBUTION

Malay Peninsula and Borneo (Sabah).

REMARKS

Borneosabahia malaysiae is highly variable in the body length, but the shape of the ante-basal impression on the pronotum seems to be a stable and good key character to identify this species. Moreover, high variability was found in the shape of the aedeagus and especially in the arrangement of internal sclerites of the endophallus. No variability in external characters correlating with various shapes of the endophallus was found, and both the shape of the median lobe and the composition of internal sclerites seem to change gradually or randomly. Since the walls of the aedeagus are lightly sclerotized and relatively fragile, the observed differences between various specimens can be regarded as a result of distortions during drying and subsequent relaxing of the material.

Collecting data of the type series of *Borneosabahia mirifica* given in the original description are as follows: "Holotypus ♂ (Penispräparat) Crocker Tange, 1500 m, Mount Kinabalu, 20. 4. 1987, lg. Burckhardt u. Löbl, cMG [i.e. MHNG]; ebenda, 1000 bis 1500 m, 24 Ex. (Paratypen), lg. Burckhardt u. Löbl (cMG u. cF) [i.e. MHNG and FRANZ collection, now in NMW], mehrere Penispräparate" (FRANZ, 1992). This does not agree with the label data in the specimens deposited in the indicated collections. The holotype of *B. mirifica* bears a label with the date 29. iv. 1987 and the altitude 1550 m, sixteen specimens labelled as paratypes were collected in various localities within the Crocker Range, at altitudes ranging from 700 to 1750 m, none of them on 20. iv. 1987 (however, one paratype and two specimens not labelled as types were collected on 20. v. 1987). There are 208

specimens deposited in MHNG and NMW, collected by the same expedition or by A. SMETANA in 1988 in the Kinabalu National Park, but not labelled as paratypes (most of them without identification labels). None of them was collected on the day indicated in the original description for the holotype and paratypes. In the case of the holotype, it may be suspected that 29. iv. was erroneously read out as 20. iv., or erroneously printed in the paper. Therefore, the specimen bearing the red label "Holotypus" can be without much doubt considered the real holotype. The specimens labelled as paratypes, despite small inconsistency with the data given in the original description, can also be identified as the real paratypes. Finding the remaining eight out of twenty four paratypes mentioned by FRANZ among over two hundred specimens was not possible. Apparently FRANZ borrowed and studied some of the non-identified specimens (as he has worked out most of the Scydmaenidae coming from the BURCKHARDT-LÖBL expedition), but there is no evidence that all of them were used for the species description. Therefore, only specimens labelled by FRANZ as paratypes are regarded as belonging to the type series.

***Borneosabahia apion* n. sp.**

(Figs. 26, 30, 39-41)

NAME DERIVATION

The Greek word "απιου" (apion) meaning "a pear" reflects the body shape of the new species.

DIAGNOSIS

This species can be identified on the basis of raised, very small, indistinct and diffused area adjacent posteriorly to ante-basal groove on pronotum; the groove is not interrupted or interrupted very indistinctly.

DESCRIPTION

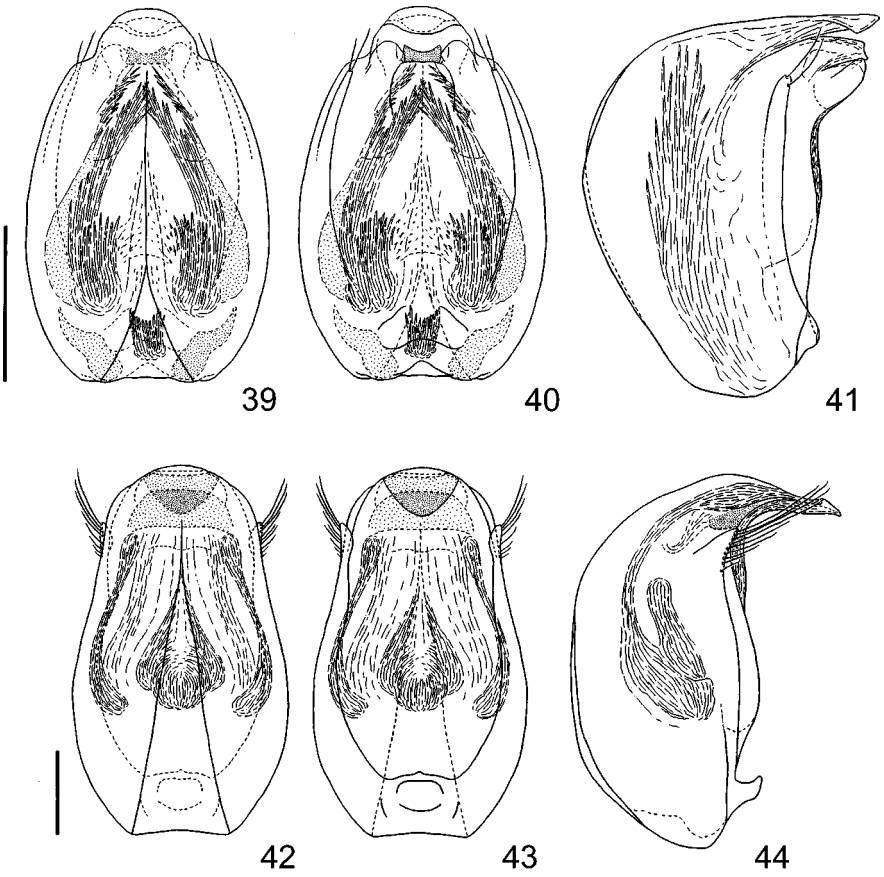
Male. General body shape, pigmentation and setation as in *B. malaysiae*; differences are indicated below. Body length 1.61-1.76 mm (mean 1.69 mm), length of head 0.29-0.30 mm (mean 0.29 mm), width of head 0.29 mm, antenna as in Fig. 30, length 0.67-0.70 mm (mean 0.69 mm). Pronotum (Fig. 26) with shallower ante-basal groove and with very small, diffused, raised middle area in most specimens located slightly posteriorly to groove, in some individuals this area is expanded toward groove, which then is very indistinctly interrupted, length of pronotum 0.42-0.46 mm (mean 0.44 mm), width 0.32-0.35 mm (mean 0.34 mm), setation of disc thinner than that in *B. malaysiae*. Elytra widest distinctly anterior to middle, with shallower basal foveae; fovea on each elytron is located in middle between humerus and suture or minimally closer to suture; length of elytra 0.90-1.00 mm (mean 0.96 mm), width 0.67-0.74 mm (mean 0.70 mm), EI 1.34-1.35.

Aedeagus (Figs. 39-41) 0.24 mm in length, very similar to that of *B. malaysiae*; differs in parameres, which are partly fused to walls of median lobe.

Female. Externally not distinguishable from male; body length 1.73-1.80 mm (mean 1.75 mm), length of head 0.30-0.31 mm (mean 0.30 mm), width of head 0.30-0.31 mm (mean 0.30 mm), length of antenna 0.65-0.70 mm (mean 0.67 mm), length of pronotum 0.44-0.47 mm (mean 0.45 mm), maximum width of pronotum 0.37-0.45 mm (mean 0.41 mm), length of elytra 0.99-1.02 mm (mean 1.00 mm), width of elytra 0.74-0.75 mm (mean 0.74 mm), EI 1.34-1.36.

TYPE MATERIAL

Holotype (male): white printed label "Fraser's Hill (leaf litter), (1.100 m), Pahang, [MALAYSIA], 6. iii. 2003, S. Nomura lg.", red printed label "*BORNEOSABAHIA apion* m., det. P. Jałoszyński, 2004, HOLOTYPUS" (NSMT). Paratypes: 1 ♂, 3 ♀♀, same data; 4 ♂♂, 4 ♀♀, same data except for 7. iii. 2003 (NSMT, PCPJ).



39-41. *Borneosabahia apion* JAŁOSZYŃSKI; 42-44. *Borneosabahia longipes* JAŁOSZYŃSKI. 39, 42 – aedeagus in dorsal view; 40, 43 – aedeagus in ventral view; 41, 44 – aedeagus in lateral view (scale bars – 0.1 mm)

DISTRIBUTION

Malay Peninsula.

REMARKS

This species externally highly resembles *B. malaysiae*, both taxa share a similar body shape, short and robust legs, and also the aedeagus has similar internal armature (however, in the studied males of *B. apion* the arrangement of bunches of needle-like sclerites is not as variable as in *B. malaysiae*). Different localization of the widest place of the elytra, the shape of the ante-basal groove on the pronotum and the parameres of the aedeagus are clearly different in the two species; moreover, *B. apion* is slightly smaller than *B. malaysiae*.

***Borneosabahia longipes* nom. n.**

(Figs. 1-24, 27, 31, 42-44)

Euconnus malaysianus FRANZ, 1990: 85, figs. 3-4 (preoccupied, not FRANZ 1984).

NAME DERIVATION

The replacement name was chosen because of the long legs of this species.

DIAGNOSIS

This species can be identified on the basis of its large body, very long, slender legs and shallow, diffused ante-basal impression on pronotum with additional pit at each end.

REDESCRIPTION

Male (Fig. 24). Body moderately dark brown, legs and palpi slightly lighter, setation yellowish; length 2.16-2.26 mm (mean 2.23 mm). Head (Figs. 1-4) very similar to that of *B. malaysiae*, differs in sparser setation of frons and vertex; setae on posterior, middle part of vertex straight; length 0.39-0.41 mm (mean 0.41 mm), width 0.42-0.44 mm (mean 0.44 mm). Antenna as in Fig. 31, length 0.95-1.00 mm (mean 0.98 mm).

Pronotum (Figs. 9-11, 27) very similar to that of *B. malaysiae*, differs in the shape of ante-basal impression which is more diffused, rather shallow; setation thin; length 0.52-0.55 mm (mean 0.54 mm), width 0.50-0.55 mm (mean 0.50 mm).

Elytra as in *B. malaysiae* but distinctly longer as compared to pronotum (about 2.4x longer than pronotum), length 1.25-1.30 mm (mean 1.28 mm), width 0.90-0.97 mm (mean 0.93 mm), EI 1.34-1.39.

Legs very long and slender, metafemora distinctly thicker than mesofemora, protibiae strongly recurved, metatibiae much longer than mesotibiae.

Aedeagus (Figs. 42-44) 0.74 mm in length; apex of median lobe strongly curved ventrally, in lateral view with distinctly delimited arrow-like distal part; external margin of each paramere fused to median lobe, with row of relatively numerous apical setae; base of parameres in lateral view with ventrally expanded

hook-like projection. Internal armature in dorso-ventral view composed of relatively short bunches of numerous very thin sclerites.

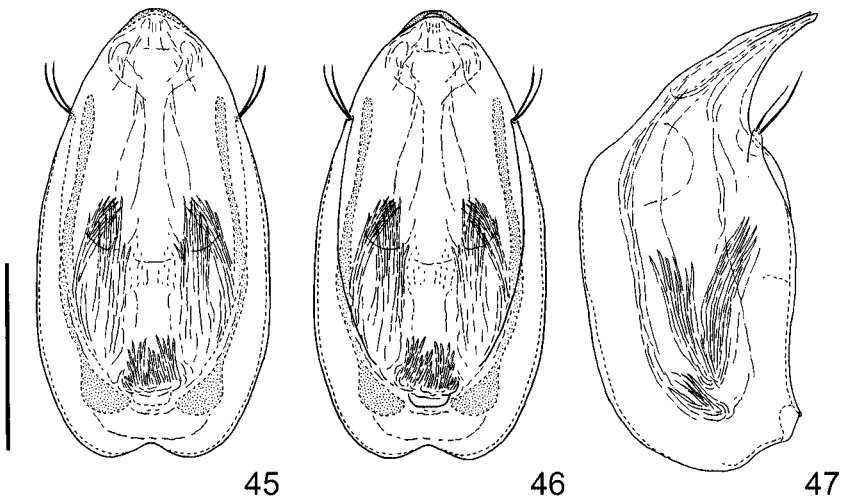
Female. Very similar to male, differs only in proportions of elytra (EI 1.38-1.43). Body length 2.12-2.22 mm (mean 2.16 mm), length of head 0.40-0.41 mm (mean 0.40 mm), width of head 0.42-0.44 mm (mean 0.43 mm), length of antenna 0.85-0.95 mm (mean 0.89 mm), length of pronotum 0.50-0.54 mm (mean 0.52 mm), width of pronotum 0.49-0.50 mm (mean 0.50 mm), length of elytra 1.22-1.27 mm (mean 1.24 mm), width of elytra 0.85-0.92 mm (mean 0.90 mm).

TYPE MATERIAL

Holotype (male): white printed label "Malaysia CH [i.e. Cameron Highlands, Pahang], BRINCHANG [i.e. Mt. Gunung Brinchang], 1550 m, möh [i.e. moss], 17. 4. 1987, T-E. Leiler", white handwritten label "Euconnus malaysiae [sic!] m." and printed "det. H. Franz", red handwritten label "Holotypus" (NMW). Paratypes: 3 exx., same data as in the holotype except for yellow handwritten label "Euconnus malaysiae [sic!] m." and printed "PARATYPUS" (NMW). All types were labelled during the present study with white printed labels "*BORNEOSABAHIA longipes* m., det. P. Jałoszyński, 2004".

ADDITIONAL MATERIAL STUDIED

1 ex., Malaysia, Cameron Highlands, 22-30. iii. 1984, ROUGEMONT leg. (misidentified by FRANZ as *Euconnus malaysiae*, Franz, 1984, and included in the type series of that species as paratype); 2 exx., Malaysia, Cameron Highlands, Gunung Brinchang, 1900 m, 11. iii. 2003, S. NOMURA leg. (NSMT); 8 exx., same data except for 2000 m, 13. vii. 2003 (NSMT, PCPJ).



45-47. *Borneosabahia dissimilis* JAŁOSZYŃSKI. 45 – aedeagus in dorsal view; 46 – aedeagus in ventral view; 47 – aedeagus in lateral view (scale bar – 0.1 mm)

DISTRIBUTION
Malay Peninsula.

***Borneosabahia dissimilis* n. sp.**
(Figs. 28, 32, 45-47)

NAME DERIVATION
The meaning of the Latin specific epithet "*dissimilis*" is "unlike, dissimilar, different".

DIAGNOSIS
This species is the smallest member of the genus, it is unique in having strongly elongate antennomere XI.

DESCRIPTION
Male. Body small, 1.40 mm in length, very similar to *B. malaysiae*, differences are described below. Head with tempora more convergent posteriorly, less rounded, length of head 0.26 mm, width 0.26 mm; antenna with different proportions of antennomeres, as in Fig. 32, length 0.72 mm; pronotum (Fig. 28) more conical, widest at base, with indistinct lateral edges, small and shallow lateral ante-basal impressions and continuous transverse groove slightly expanded anteriorly in middle; setation thin, length of pronotum 0.37 mm, width 0.32 mm; elytra widest anterior to middle, basal fovea on each elytron very shallow, located in middle between humerus and suture, length of elytra 0.77 mm, width 0.62, EI 1.24.

Aedeagus (Figs. 45-47) 0.24 mm in length, distinctly differing from all copulatory organs of other species in less curved apical part in lateral view, not delimited from basal part of median lobe in dorso-ventral view and indistinct longitudinal division of dorsal wall; parameres partly fused to median lobe, each with two apical setae; internal armature composed of relatively short bunches of thick rod-like sclerites.

Female. Unknown.

TYPE MATERIAL
Holotype (male): white printed label "SABAH: Kibongol V., 7 km N Tambunan, 700 m, 20. V. 1987, Burckhardt-Löbl", labelled as paratype of "Sabahia mirifica" (sic!); during the present study additional red printed label was added, "*BORNEOSABAHIA dissimilis* m., det. P. Jałoszyński, 2004" (NMW).

DISTRIBUTION
Borneo (Sabah).

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