

Genus	Vol. 22(3): 347-425	Wrocław, 30 XI 2011
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Taxonomy and phylogeny of the subtribes Phrixiina COBOS and Haplotrinchina HOLYŃSKI with remarks on the systematic position of *Pseudhyperantha* SAUNDERS (Coleoptera: Buprestidae)

ROMAN B. HOLYŃSKI

PL-05822 Milanówek, ul. Graniczna 35, skr. poczt. 65, e-mail: holynski@interia.pl

ABSTRACT. The paper presents the first attempt to clarify the phylogenetic and taxonomic relationships of two hitherto very poorly known subtribes (the Phrixiina COB. and Haplotrinchina HOL.), phylogenetic approach to clarify the widely disputed systematic position of the genus *Pseudhyperantha* SND., and biogeographical interpretation of some apparently puzzling aspects of the resulting patterns. Besides, one subgenus (in the genus *Haplotrinchus* KERR.), 17 species [1 in *Ovalisia* KERR., 1 in *Melobasina* (*Ulaikoilia* B.K.V.), 1 in *Melobasina* (s.str.), 2 in *Haplotrinchus* (*Transwallacea* sg.n.), 3 in *Haplotrinchus* (s.str.), 5 in *Phrixia* (s.str.), 1 in *Phrixia* (*Stephansortia* THY.), 3 in *Exagistus* DEYR.] and 2 subspecies [both in *Haplotrinchus* (s.str.)] are described and numerous taxonomic modifications proposed. At last, at this occasion some opinions expressed and taxonomic or nomenclatural solutions adopted in the recent paper by BÍLÝ & al. (2009) are discussed.

Key words: entomology, taxonomy, biogeography, Haplotrinchina HOL., MICSEQ, Phrixiina COB., phylogeny, *Pseudhyperantha* SND., taxonomy

BÍLÝ & al. (2009) recently described a new genus *Ulaikoilia* BÍLÝ, KUBÁŇ et VOLKOVITSH for one species from New Guinea. In the material borrowed from the Koninklijk Belgisch Instituut voor Natuurwetenschappen (KBIN) in Brussels I found a specimen labelled as the type of *Haplotrinchus* (*Nesotrinchus*) *titschacki* HOSCHECK, apparently belonging in fact to the above-mentioned taxon. As my work proceeded, the specimen successively lost its uniqueness: Ulf NYLANDER sent me another example for study, Charles BELLAMY two more, at last I received additional four from Thierry Neef de SAINVAL; moreover, Drs. BÍLÝ and KUBÁŇ have kindly informed me (and sent a photograph) of another “type” of “*Haplotrinchus* (*Nesotrinchus*) *titschacki* HOSCHECK” preserved in

the Naturhistorisches Museum Basel (coll. FREY), and C. BELLAMY supplemented the material with the data on, and photographs of, yet another example. Besides, as far as I remember, in 1994 I saw a representative of the same or very closely related species among the Natural History Museum (London) material from fumigation experiments on Borneo; unfortunately I could not confirm this as the – initially promised – loan of that material has been finally refused because I was not employed in a museum or university... For the same reason I cannot verify the systematic position of Fijian *H. splendens* WATH., although based on my old (from still earlier – 1978 – visit in BMNH) notes on the type [“looks atypical for *Haplotrinchus*, resembling rather *Melobasina* but stumpy (14×5.5 mm.)”, “elytra not wavy”] and details of original description (pattern of colouration, “no carina at the sides of the thorax”, “no impressions on the elytra”) I suspect it may belong rather to *Ulaikoilia* B.K.V. than to *Haplotrinchus* KERR. Anyway, the distribution of *Ulaikoilia* B.K.V. is not restricted to New Guinea, nor its content to *U. jelineki* B.K.V., and “*Haplotrinchus titschacki* HOSCH.” is not so rare as it initially seemed. However, to my best knowledge, its description has never been published, thence I do this here.

To clarify the systematic position of *Ulaikoilia* B.K.V. and evaluate other, somewhat “revolutionary” concepts presented by BÍLÝ & al. (2009), I performed the phylogenetic reconstruction of the subtribes **Haplotrinchina** HOL. and **Phrxiina** COB. [*sensu* HOLYŃSKI 1993; the analysis (see below) suggests that BÍLÝ & al. (2009) may be right in considering the **Haplotrinchina** HOL. polyphyletic, but the results are not unequivocal and in the taxonomic part I “conservatively” treat *Melobasina* KERR. as a member of that tribe] including some representatives of the **Dicercina** GISTL as well as – to check once more the proper placement of *Pseudhyperantha* TMA. – the **Stigmoderina** LAC. and **Buprestina** LEACH. At this occasion I also provide the descriptions of some relevant new taxa and comments on some others. Last not least, the subtribes **Haplotrinchina** HOL. and **Phrxiina** COB. having been largely neglected, with no modern revisions available and their representatives rarely even mentioned in the literature, I found it warranted to provide keys for the identification of the Indo-Pacific members of these taxa; as not all of them have been available to me for direct study, the keys are partly based on characters reported in published descriptions, but even so they should be useful as a starting point to further studies.

Like in my other publications (unless “corrected” by editors...), I follow the very useful conventions of applying (of course, except wordly citations, where the original form must be retained) SMALL CAPS to *all* [irrespective of context and full vs. abbreviated version: inconsistent use deprives the display of any sense!] personal family- (not given-) names, *italicizing* species- and genus-group names, and writing the suprageneric taxon-names in **Bold** [the latter is not a generally accepted custom, but is often – as in the case of present paper – important, as some of such names (*e.g.* of the subtribes **Buprestina** LEACH or **Melobasina** BÍLÝ) are (or may easily become) “homonymous” (but valid!) with generic or subgeneric ones (*Buprestina* OBB., *Melobasina* KERR.)]: we must make possibly unequivocal what we have in mind, and possibly easy for the reader to “optically” spot the “wanted” name in the (especially longer) text!

I do not use such terms as “syn. nov.” or “comb. nov.”: a synonymy or combination (contrary to names) is either correct or not, perfectly irrespective of being “new” or “old”, so the differentiation between them is (besides some “snobistic” value) absolutely irrelevant and it would make no sense whatsoever to perform a special search throughout all the earlier literature only to find out whether somebody before me considered the particular name synonymous or particular species belonging to particular genus. I do not believe that anybody (except perhaps some exceptionally crazy “bibliographic archaeologists”...) does indeed perform such “excavations”, while carelessly applied such “markers” become not merely superfluous but simply false [a good example being “*Nesotrinchus australicus* (Kerremans, 1903), comb. nov.” and “*Nesotrinchus caeruleipennis* (Fairmaire, 1877), comb. nov.” in BILÝ & al. (2009), accompanied immediately with the quotations of, respectively, “*Nesotrinchus australicus*: THÉRY (1903)” and “*Nesotrinchus caeruleipennis* (Fairmaire): OBENBERGER (1936)”] – strikingly old are these “new” combinations...

Abbreviations:

- A** anterior;
B basal;
M maximum;
L length [length of body (quoted as absolute value as well as in proportions) has always been measured from tips of elytra to anterior (as seen from above) margin of eyes, even if it may not be the anteriormost point of the head];
W width [width of elytra = width of body (quoted as absolute value as well as in proportions) has always been measured just behind humeral protuberances, even if it may be greater at some other place];
VW width of vertex [between the eyes in dorsal aspect];
HW width of head [with eyes].

Collections:

- BPBM** Bernice P. Bishop Museum, Honolulu;
CLB Charles L. BELLAMY, Sacramento;
CSCA California State Museum of Arthropods, Sacramento;
KBIN Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussels;
NHM Naturhistorisches Museum, Basel;
RBH Roman B. HOLYŃSKI, Milanówek;
TNS Thierry Neef de SAINVAL, Ellezelles;
UN Ulf NYLANDER, Valbo.

Lamprodila ANON. [?MOTSCH.]

Lamprodila ANONYMUS [?MOTSCHULSKÝ] 1859: 11.

REMARKS

In my recent paper (HOLYŃSKI 2011) I expressed some doubts as to the possibility and desirability of [re-]introduction of the name *Lamprodila* MOTSCH. for the genus

currently known as *Ovalisia* KERR. but, having not known either the original paper or the proponent of the change or his/her motivations, I must have restricted myself to some general remarks. Recently I received a copy of “MOTSCHULSKY’S” publication (ANONYM 1859) and relevant quotations from KUBÁŇ (2006a, b), so I can formulate a better substantiated opinion. For the sake of discussion I quote here the respective fragments in full:

“*Les Sternoxes et Longicornes sont assez pauvres, à l’exception d’une magnifique Lamprodila (Lampra) virgata m. ...*” [ANONYM 1859: 11 (remarks on the beetles collected “sur les rives du fl. Amour pendant 1858” by “Madame E. Gaschkevitch”)]

“*Lamprodila Motschulsky, 1860 is an overlooked replacement name for the homonymous Lampra Dejean, 1833, and an objective synonym of Scintillatrix Obenberger, 1956. It is used as valid, although the conditions meeting the Art. 23.9.1, ICZN were not examined. The involved taxa are at present placed in Ovalisia Kerremans, 1900, Palmar Schaefer, 1949, and Scintillatrix Obenberger, 1956. They are treated inconsistently by the authors. It is assumed that the use of the older name Lamprodila may assure more stability in the nomenclature of the group. The older name, Castalia Laporte & Gory, 1836, is a junior homonym and cannot be used*” [KUBÁŇ 2006a: 52].

“**genus Lamprodila Motschulsky, 1860a: 11** [RN] type species *Buprestis rutilans* Fabricius, 1777
subgenus Lamprodila Motschulsky, 1860a: 11 [RN] type species *Buprestis rutilans* Fabricius, 1777
Castalia Laporte & Gory, 1836: 114 [HN] type species *Buprestis rutilans* Fabricius, 1777
 [*Dendrochariessa* Gistel, 1848: ix, suppressed name]
Lampra Dejean, 1833: 78 [HN] type species *Buprestis rutilans* Fabricius, 1777
Scintillatrix Obenberger, 1956a: 41 [RN]” [KUBÁŇ 2006b: 52].

A minor point is the discrepancy between the citation in KUBÁŇ (2006a) and his followers [“MOTSCHULSKY 1860”] and what is seen in the respective volume of *Études entomologiques*, where the date is given as 1859 [indeed, even “1 Janvier” – though the meaning of this is not evident] and the paper itself [as **the only** in this issue] has not been signed with any name, so it is effectively anonymous (of course we can **suppose** that it is an “editorial” written by MOTSCHULSKY, but this is only a supposition!). More important is the meaning of the respective sentence: KUBÁŇ (2006a, b) interpretes it as a “replacement name for the homonymous *Lampra Dejean, 1833*” [consequently considering *Buprestis rutilans* Fabricius, 1777 as type species] but this is only one – and, in my opinion, not the most probable... – of possible interpretations [the more so that the author, writing (two pages earlier **in the same paper!**) on the beetles collected by RADDE, uses the name *Lampra* (“*parmi les Buprestides sont cités: une Lampra ...*”), as does – either as genus “*Lampra*” or as subgenus “*Poecilnota (Lampra)*” – MOTSCHULSKY in his other contemporaneous papers (MOTSCHULSKY 1860a, b)]. It would be rather strange to suppose that the experienced author was so inconsistent – other interpretations of the phrase “*Lamprodila (Lampra) virgata m.*” seem more probable! And there are at least three: perhaps Madame GASCHKEVITCH had sent the beetle under misspelled name *Lamprodila* and the author of *Voyages and excursions entomologiques* felt important to explain that it refers in fact to *Lampra*; or perhaps he wished to separate *L. virgata* MOTSCH. into a genus of its own (in which case that spe-

cies, not *Buprestis rutilans* F., would be the type), or perhaps his intention was indeed the introduction of a replacement name, but for *Poecilonota* rather than for *Lampra* (leaving the latter as unchanged **sub**generic name, like elsewhere in combination with *Poecilonota*)? Anyway, even though I am generally an advocate of strict application of the Principle of Priority (which, however, would demand rather the application of *Dendrochariessa* GISTL 1848!), the [?re-]introduction of a name once, vaguely (by an effectively anonymous author whose intentions remain nebulous) mentioned 150 years ago and known to nobody since then, to replace the well-known, widely used generic (*Ovalisia* KERR.) and subgeneric (*Scintillatrix* OBB.) names, appears to me as absolutely unwarranted, at odds with both the commonsense and the Code, and it is only a pity that it has been applied in two potentially most influential Catalogues (LÖBL & SMETANA 2006. and BELLAMY 2008)...

***Ovalisia (Cinyrisia) deceptiva* sp. n.**

MATERIAL EXAMINED

Holotype: “Borneo, Ranau, 03., VI.10. Chew leg.” “*Lamprodila* sp., det. Sv. Bílý” “807, U. Nylander” [green label] [?♂ (UN)].

DESCRIPTION

Holotype: Male [?] 14.5×4.5. Bronzed-cupreous above, brighter cupreous below; labrum and anterior part of front with bluish-black shine, antennae dark blue. Dorsal side glabrous, prosternal process and abdomen with short, rather sparse, recumbent whitish pubescence.

Epistome semicircularly emarginated, coarsely and densely punctured, separated from front by very indistinct brace [{}]-shaped carinula; supraantennal ridges somewhat irregular, oblique, straight, slightly prolonged upwards; front trapezoidal (*ca.* 1.6× wider below than above), with large, conspicuous, mat, transversely triangular relief at middle; vertex with fine median stria bordered with pair of very fine and indistinct smooth ridges; anterior (below triangular relief) part of front very shallowly depressed, coarsely but sparsely punctured; punctures covering upper part and vertex deep and very dense, subconfluent into irregular longitudinal rugae; VW:HW≈0.48. Antennae short, reaching but slightly beyond anterior angles of pronotum; 1. joint not quite 2× longer than thick; 2. globular, thinner and twice shorter than 1.; 3. still thinner but 1.5× longer; 4. triangular, as long as 1. and nearly 2× wider than 3.; 5.-10. progressively shorter (9.×10. together *ca.* as long as 4.), of broadly rounded outer angles; 11. obliquely ovate, somewhat longer than 10.

Pronotum transversely [L:H≈0.7] quadrangular; basal margin rather deeply subangularly bisinuate, anterior very shallowly emarginate; sides distinctly sinuate just before acute basal angles, nearly straightly (almost imperceptibly arcuate) parallel from basal eighth to apical sixth, and roundedly narrowed apically. Median line with small, shallow, subtriangular fovea at anterior 2/5, and larger, deep, rounded before scutellum; narrow transverse depression just behind apical margin very inconspicuous (no distinct “collar”); lateral carina obliquely straight, sharp, reaching slightly beyond midlength.

Bottoms of median foveae smooth, otherwise moderately coarse puncturation rather dense along middle, somewhat sparser midlaterally, and very dense (almost confluent) on sides. Scutellum rather large (nearly as wide as three interstriae), subpentagonal with emarginate anterior margin, strongly divergent straight sides, rather sharp right lateral angles, and deeply sinuate lateroposterior margins meeting at acute angle; surface smooth, median depression broad at base and narrower apically.

Elytra (L:W \approx 2.3) with rather long (*ca.* half pronotal length) humeral truncation, then sides slightly narrowed to anterior third, subparallel to midlength and regularly arcuate to bidenticulate apices; lateroapical margins sharply and densely serrate. Humeral protuberances moderately prominent; basal depressions broad but shallow and irregular, lateral posthumeral broad but very shallow and indistinct, otherwise surface regularly convex. Inner striae fine and finely punctured, lateralwards both striae and punctures become somewhat coarser; interstriae practically smooth at middle of disk, finely and densely rugosopunctulate on sides. Epipleura very narrow and poorly delimited before metaxoxae, totally disappear behind.

Anterior margin of prosternum shallowly but conspicuously emarginate, bordered throughout with narrow but deep groove and somewhat broader transverse swelling immediately behind; puncturation of proepisterna sparse; prosternal process wide, anteriorly flat, shallowly depressed towards apex, without any bordering stria or rim, rather coarsely and very densely irregularly punctured except for tip of broadly truncated median apical lobe. Metasternum flat, medially sulcate, punctures rather sparse on disk but denser on sides; metepisterna slightly convex, each with irregular and inconspicuous longitudinal ridge running along middle; metacoxae without denticle. Abdomen finely but densely punctulate, without distinctive reliefs or dfp areas; 1. sternite regularly convex; anal segment trapezoidal, much wider than long, apex truncate between pair of carinate spines, carinae extent to *ca.* midlength of sternite, at middle just before apical margin small but rather distinct tubercle, broad apical lamina filling more than basal half of transversely rectangular space between lateroapical spines.

GEOGRAPHICAL DISTRIBUTION

Known only from the holotype labelled "Borneo: Ranau" (probably Ranau in Sabah, *ca.* 15 km. SE of Mt. Kinabalu, 5°57'N-116°40'E).

REMARKS

The name of this species refers to its truly deceptive appearance: at the first glance from above it is virtually indistinguishable from *O. (Mabomisia) sexspinosa* (THS.) – except for lack of dark elytral specks (which, however, might easily be considered individual variety), and bi- rather than tridenticulate elytral apices (rather unobtrusive feature...) there is nothing to raise any doubt as to the identification. Only a look at the ventral side shows difference in colouration (cupreous instead of green), and closer examination of prosternal process (densely punctured, without marginal groove) and anal sternite (carinately bispinose) discloses its true identity as not only different species but a representative of different subgenus! In fact, it evidently belongs to the *Aenea*-circle of the subgenus *Cinyrisia* HOL.

Haplotrinchina HOL.

Haplotrinchina HOLYŇSKI 1993: 13, 27, 37.

Contrary to BÍLÝ & al.'s (2009) opinion, “*the definition of the subtribe Haplotrinchina by HOLYŇSKI (1993)*” is quite unambiguous (even if “polythetic” and – consequently – somewhat complicated). However, the present phylogenetic analysis (see below) suggests that *Melobasina* KERR. and *Haplotrinchus* KERR. may be not closest relatives, what, if confirmed by further studies, would justify the creation of the subtribe **Nesotrinchina B.K.V.** (nb. a very “unlucky” name, as the type-“genus” – *Nesotrinchus* OBB. – is at most a subgenus of *Melobasina* KERR.).

KEY TO INDO-PACIFIC GENERA

- 1(2) Inner margins of eyes almost parallel, vertex wide (VW:HW \approx 0.5 or more). Late-roapical margin of elytra denticulate *Melobasina* KERR.
 2(1) Inner margins of eyes markedly convergent upwards, vertex narrow (VW:HW \approx 0.35 or less). Lateral margin of elytra smooth throughout
 3(4) Scutellum normal, small, *ca.* as wide as two interstriae. Ventral line of sternum in lateral view continuous, not angular at pro-metasternal meeting point
 *Haplotrinchus* KERR.
 4(3) Scutellum large, as wide or wider than three interstriae. Viewed from side metasternum meets prosternum at conspicuous angle *Cardiaspis* SND.

***Melobasina* KERR.**

Melobasina KERREMANS 1900: 68-69.

Type species: *Melobasina apicalis* KERREMANS 1900: 69.

KEY TO SUBGENERA

- 1(2) Body stout (L:W=2.4-2.7), colouration bright (uniformly green or blue)
 *Ulaikoilia* B.K.V.
 2(1) Body slender (L:W=2.9-4.2), multicoloured or colouration dull
 3(4) Front flat or nearly so also in anterior part. Elytra not or but indistinctly caudate
 *Melobasina* KERR. s. str.
 4(3) Anterior part of front deeply hollowed between supraantennal carinae. Elytra conspicuously caudate *Nesotrinchus* OBB.

***Melobasina* sg. *Ulaikoilia* B.K.V.**

Ulaikoilia BÍLÝ, KUBÁŇ & VOLKOVITSH 2009: 759-760.

Type species: *Ulaikoilia jelineki* BÍLÝ, KUBÁŇ & VOLKOVITSH 2009: 760-761.

KEY TO SPECIES

- 1(2) Body blue. No laterobasal depressions on pronotum *jelineki* B.K.V.
 2(1) Body green, sometimes with strong cupreous hue. Laterobasal pronotal depressions deep *hoschecki* sp. n.

***Melobasina (Ulaikoilia) hoschecki* sp. n.**

Haplotrinchus (Nesotrinchus) titschacki [HOSCHECK *in litteris*].

MATERIAL EXAMINED

Holotype: “Philippinen, Luzon, *n. Bayombong*” “*S. Boettcher, 14. I[?]. 16*” [reverse of label] “Typus” “224I” [blue label] “*Haplotrinchus (Sbg. Nesotrinchus) Titschacki m.n.sp., Det. Hoscheck 1934*” “*Haplotrinchus, s.g. Nesotrinchus Obb. n.sp., THERY det.*” [♀ (KBIN)]

Paratypes: “PHILIPPINES, R.M. Lumawig” “*new genus near Melobasina Kerr., A. Descarpentries det.*” [1♀ (CLB)]; “*Coll. P. BLEUZEN, Ile Sibuyan, Romblon, Philippines*” “*NEZOTRINCHUS titschacki Hosch., DET. P. BLEUZEN*” “*New genus near Melobasina sensu Descarpentries*” “201” [1♀ (RBH: BPkid)]; “*NEZOTRINCHUS LITSCHAKRP*” [*sic!*] [1♀ (TNS)]; “*PROV. D’ABRA, N.LUZON, PHILIPPINES, VII. 80, I. G. MINET*” [1♀ (TNS)]; “*PROV. D’ABRA, N.LUZON, PHILIPPINES, VII. 80, I. G. MINET*” “*NEZOTRINCHUS LITSCHAKKI [sic!], Philip.*” [1♀ (TNS)]; Philippines, Mt. Prov., North Luzon, 06-91, Lumawig” “*Nesotrinchus titschacki*” “2637, U. Nylander” [green label] [1♀ (UN)]

ADDITIONAL MATERIAL

“*WING*” [red label] “*PHILIPPINES, Negros, 11.VI 1985*” [1♂ (CLB)];
 “Philippinen, Luzon, *n. Bon.bong[?]*” “Typus” “2605” “*Haplotrinchus (Sbg. Nesotrinchus) Titschacki m.n.sp., TYPE, Det. Hoscheck 1939*” “*Typenbezeichnung fraglich, 1956, det, Kemp*” [red letters] “*Collection Naturhistorisches Museum Basel, coll. Frey*” [1♀ (NHM)] (only photographs of the specimen and labels seen); “*Zamboanga del Norte, Mindanao, April 2011*” [1♀? CLB] (only photographs seen).

DESCRIPTION

Holotype: Female 11.3×4.4 mm. Bright green, dorsal side and (less conspicuous) abdomen with strong golden shine (concentrated at anterior third of each elytron – between 2 and 5 striae – into very inconspicuous, small, rounded, golden-cupreous spot), sternum darker, tarsi and (at least part of) outer edges of tibiae violaceous, labrum and antennae dull green. Front, prosternal process and abdomen with short, not dense, semierect whitish pubescence, otherwise dorsal side glabrous and ventral with very short and sparse setulae.

Epistome shallowly angularly emarginated. Anterior margin of front in shape of brace (broadly rounded with small angular denticle at middle), distinctly elevated above epistome as smooth ridge joining prominent but short supraantennal carinulae

not clearly separated from front; front slightly trapezoidal ($<1.2\times$ wider at epistome than at vertex), broadly semicircularly depressed in anterior part, rather coarsely but not very densely irregularly punctured, with median furrow reduced to small elongate median pit at upper end; vertex wide (VW:HW ≈ 0.5) punctulation much finer than on front. Antennae short (reaching to *ca.* anterior third of pronotal sides), with short (*ca.* twice longer than wide) basal joint, much thinner globular 2., subcylindrical 3. as long as 1., progressively shorter but wider (up to *ca.* $1.5\times$ wider than long) 4.-10., and again smaller ovate 11.; basal 3 antennomeres glabrous, others distinctly pilose.

Pronotal base deeply bisinuate with prominent prescutellar lobe and slightly acute basal angles; sides subparallel to near midlength then regularly arcuately narrowed to prominent anterior angles (BW:AW:L $\approx 1.65:1.15:1$); apical margin shallowly bisinuate. Surface with pair of deep and broad transversely arcuate depressions at basal third and narrow preapical furrow distinct only toward sides; disc finely and sparsely punctured, punctures become denser and much coarser at basal $\frac{2}{3}$ of sides; lateral carina sharp and regular in basal half, less so anteriorly, extended to near apex.

Elytra (L:W ≈ 1.9) subparallelsided in anterior fourth, sides distinctly sinuated to midlength (there slightly exceeding their anterior, "standard" width) and sinuately tapering (distinctly "caudate") to tridenticulate (sutural denticle right-angled, other two sharply acute; median most prominent, closer to sutural than to lateral) apices; from before midlength to apices lateral margins distinctly denticulate. Laterobasal depression between 3. stria and humeri deep and broad; humeral protuberances prominent, broad (indefinite arcuate inner margin touching 3. interstria) lateral depression shallow but distinct, extends along sinuation of elytral sides from just behind humeral protuberance to widest point at midlength; obliquely subtriangular preapical depression also distinct. Periscutellar and first (inner) puncture rows fine but regular, 10. (perimarginal) also entire, 4.-9. at least partly confused, with punctures transversely confluent into shallow but distinct rugae; 10. throughout, others apically depressed into deep striae; epipleura not extending beyond metacoxae, epipleural denticle roundedly obtuse, sinuation behind it rather deep.

Anterior margin of prosternum very shallowly emarginated between pair of minute tubercles; puncturation of proepisterna sparse, conspicuously ocellate; that of prosternal process fine and sparse, simple; sides bordered with conspicuously convergent (but not meeting at apex) deep, somewhat coarser punctured furrows; metasternum finely and rather sparsely, abdomen more coarsely and (especially along middle of 2-4 sternites) very densely, punctured, at sides punctures ocellate. Metacoxae without denticle; all abdominal segments evenly convex; apical sternite deeply arcuately emarginate between pair of sharply acute denticles.

Variability: Paratype females (10.2 \times 3.8-11.4 \times 4.5 mm.) differ only in some trifling details: all are less golden (sometimes almost pure green) dorsally (what makes elytral spots somewhat more distinct), ventral side and (in most specimens) legs almost purely green; in smaller ex. anterior margin of front often regularly rounded (without median angular projection) and anterior depression reduced to small rounded fovea, pronotal sides variously subparallel to between posterior and anterior third; otherwise practically identical to holotype. The Basel specimen, according to the picture, seems not to differ

from the holotype in anything essential, being only slightly more cupreous dorsally (what, however, may be photographic artifact); also the photograph of the specimen from Mindanao looks somewhat unusual (very pale colouration, less lustrous surface, more anteriorly placed pronotal depressions, more acute lateroposterior angles of scutellum, flatter and partly finer puncture rows on elytra), but all these differences may be misleading effects of preservation (long time in humid chamber – C. BELLAMY, pers. inf.) or photography. Male (9.3×3.5 mm.) darkest green; anal sternite shallowly subtrapezoidally emarginate, lateral denticles shorter; aedeagus clayey-brown, sides of parameres regularly arcuate, apex of penis sharply angular but not spinose (sides arcuate to the tip). It is the only male and at the same time the only specimen examined by me coming definitely from island other than Luzon, so it is not sure whether the non-genitalic differences are of individual, sexual, geographical (subspecific) or specific nature, what prevents me from including it among the paratypes. Besides, the beetle from Mindanao shown on fig. 719 in AKIYAMA & OHMOMO (2000) as *Haplotrinchus viridula* (OL.) is evidently not that species and not a *Haplotrinchus* KERR. at all but an *Ulaikoilia* B.K.V., possibly conspecific with *M. (U.) hoschecki* sp. n.; its length is given as 12.5 mm., similar to that (11.8 mm. without head) reported by BELLAMY (pers. inf.) for the only other specimen known from that island, but larger than any of those examined by me; it is not clear whether this represents an individual, geographic, or specific difference.

GEOGRAPHICAL DISTRIBUTION

Philippines: Luzon, Sibuyan, ?Negros, ?Mindanao.

REMARKS

Except for green rather than blue colouration, somewhat different structure of pronotum (deep laterobasal depressions, nearly right basal angles), shallower sinuation of epipleura at metacoxae, shorter lateroapical denticles of anal sternite, and not spinose apex of penis, no significant difference from the description of *Ulaikoilia jelineki* B.K.V. is apparent. BÍLÝ (in litt.), without having specified the arguments, wrote me that “*this species doesn't belong to Nesotrinchina !! ... Unlike its habitus, this species belongs somewhere to/near Lamprodila*”: I am utterly unable to find any serious evidence to support such conclusion! BÍLÝ & al. (2009) differentiate their ***Nesotrinchina* B.K.V.** from ***Poecilonotina* JAK.** according to the following features:

P: “*Posterior half of lateral pronotal margins forming sharp keel; hypomera flat, punctate, with fine and narrow groove along lateral pronotal keel*”

N: “*Posterior half of lateral pronotal margins with obtuse or callus-like keel, ...; hypomera uneven ... with wide and deep groove along lateral pronotal keel*”.

The degree of “sharpness” and “narrowness” (as well as the length of the sharp basal part) of pronotal lateral carina vary tremendously in both “subtribes”, but anyway all specimens of the new species show in these respects much more similarities to the representatives of *Melobasina* KERR. s.str. (*Nesotrinchus* OBB. is indeed aberrant) than to most *Ovalisia* KERR. (“*Lamprodila* MOTSCH.”); by the way, the same is true of many *Haplotrinchus* KERR.

P: “anal ventrite apically emarginate, more or less sharply bispinose, rarely rounded (except for ...*Mabomisia* ...), evenly convex (except for... *Cinyrisia*...)”.

N: “anal ventrite very sharply bispinose in male ...or trispinose in female (rarely with reduced median spine as in fig. 70), spines long, needle-shaped, each lateral spine bearing elevated carina...”.

As I have repeatedly pointed out, and as confirmed by so numerous exceptions – “more or less”, “except for”, “rarely” – in the definitions quoted above, sexual characters (here: details of anal sternite) are notoriously unreliable as evidence of phylogenetic or taxonomic relationships: “the very function of their interspecific differentiation (to serve as [a component of] specific mate recognition system [SMRS]) causes their frequent involvement in reproductive character displacement what, however, may be easily achieved by simple “variations on few themes”: switching at each disspecciation – or secondary contact – between strikingly differing “character-states” ... or even complex (inherited as supergenes) structures, what leads to the commonly observed pattern of striking ... dissimilarity in closely allied sympatric species and near-identity in non-relatives” (HOLYŃSKI 2009b)! As regards the anal sternite, an especially instructive illustration of this phenomenon is the situation in *Dicerca* ESCH., where various combinations of male and female apical margins (rounded, emarginated, notched, binotched) – accompanied with various degrees of development (none, short and obtuse, long and spiniform) of male tibial spur – irregularly reappear in distant clades (HOLYŃSKI 2005 and 2011). Lack of well-defined sexual dimorphism (apex simply emarginate between relatively short denticles in both male and female of the new species) is especially uninformative, as this is the normal (“primitive”, “plesiomorphous”) unchanged state common in almost all groups.

P: “apical third of elytral margins very finely and densely serrate, elytral apices indistinctly bi- or trispinose (except ... *Erialata* and *Mabomisia* ...), sometimes only obliquely truncate or rounded”

N: “apical third of elytral margins sparsely but sharply and roughly serrate, elytral apices always trispinose”.

In both respects the new species resembles rather the “**Nesotrinchina B.K.V.**” than most representatives of “**Poecilnotina JAK.**”: serrulation is similar to but the coarsest version occurring (rarely) in *Ovalisia* KERR. and barely finer than in *Melobasina* KERR.; while sharply tridenticulate elytral apex is virtually identical to that shown by all species of the latter but only very exceptionally (subgenera *Erialata* HOL. and *Mabomisia* HOL. of *Ovalisia* KERR.) observed in the former (HOLYŃSKI 2000).

So, according to BILÝ & al.’s (2009) own definition the new species clearly belongs to what they consider the subtribe **Nesotrinchina B.K.V.**; if we take into consideration the characteristics of colouration (no trace of dark spots or reliefs on either pronotum or elytra), sculpture (lustrous, contrastingly finer and sparser on disk of pronotum than on sides), deep laterobasal pronotal depressions, shape of elytra (strongly “caudate”, sides distinctly sinuate in basal half), &c., then hardly any doubt remains as to the affinity of the new species to *Melobasina* KERR. rather than to *Ovalisia* KERR. As remarked above, the differences between the new species and *Ulaikoilia jelineki* B.K.V. are rather slight, what makes the placement of both in the same supraspecific taxon the only

reasonable. On the other hand, the characters distinguishing so expanded *Ulaikoilia* B.K.V. from *Melobasina* KERR. [bright green or blue colouration, wider and shorter body with – consequently – more distinctly “caudate” elytra, more prominently widened anterior part of epipleura, somewhat finer posterolateral serration of elytra, simply bidentulate anal sternite; other features mentioned by BÍLÝ & al. (2009) are evidently specific “autapomorphies” of *U. jelineki* B.K.V.] do not seem to exceed the normal range of intrageneric variability, so I consider *Ulaikoilia* B.K.V. a subgenus of *Melobasina* KERR. The differences between the *Melobasina* KERR. s. str. and *Nesotrinchus* OBB. are still less pronounced, what makes the separation of the latter at the generic level obviously untenable, though characters (partly overlooked by me before) quoted by BÍLÝ & al. (2009) seem to question my earlier opinion that it “cannot be separated even as a subgenus” (HOLYŇSKI 1993) as perhaps too radical.

***Melobasina* KERR. s. str.**

Melobasina KERREMANS 1900: 68-69.

Type species: *Melobasina apicalis* KERREMANS 1900: 69.

KEY TO SPECIES

- 1(12) Pronotum unicolorous, Sutural interstria concolorous with rest of elytral surface
- 2(11) Prosternal process smooth between marginal grooves. Laterobasal depressions on pronotum very deep; lateral carina reaches to *ca.* anterior fourth
- 3(10) Pronotum greenish or cupreous
- 4(9) Anterior half of elytra cupreous
- 5(8) Vertex and pronotum bright cupreous. Front at middle with smooth ^-shaped relief. Sides of pronotum regularly rounded or straight from base
- 6(7) Body unicolorous (only elytral apex and suture black), bright cupreous-red above and below. Sides of pronotum almost straightly convergent *ignita* (THY.)
- 7(6) Only pronotum bright cupreous-red, apical half of elytra purplish transgressing towards apex to violaceous-black, ventral side from green prosternum through cupreous metasternum and anterior part of abdomen to purplish 4. and violaceous-black 5. sternite. Pronotal sides markedly rounded *apicalis* KERR.
- 8(5) Vertex and pronotum dull green. Front uniformly punctured. Pronotal sides conspicuously sinuate before base *fossicollis* (KERR.)
- 9(4) Elytra dark greenish-blue becoming black towards suture. Abdomen (except median parts of 1. sternite) finely and sparsely punctulate *chrysocyanea* sp. n.
- 10(3) Pronotum blackish-blue *solomonensis* (THY.)
- 11(2) Prosternal process coarsely punctured throughout. Pronotal depressions shallow and indefinite, lateral carina not extending beyond midlength *riedeli* K.B.
- 12(1) Pronotum bicolorous: disc blackish, broad lateral bands green or cupeous; elytra violaceous-blue with golden-green sutural interstria *suturalis* (DEYR.)

Melobasina (s. str.) *ignita* (THY.)

Nosotrinchus [sic!] *ignitus* THÉRY 1943: 647-648.

REMARKS

Very similar to – and by BILÝ & al. (2009) synonymized with – *M. apicalis* KERR., but according to the original description differs in some details of uncertain significance; as also the type localities (Solomons: Bougainville I.: Buin vs. Louisiades: Tugela I.) are widely different, I prefer to retain it tentatively as separate taxon. By the way, notwithstanding the “corrections” in BILÝ & al. (2009), Bougainville I. is a part of the Solomon – not Bismarck – Archipelago (even if politically belonging to the state of Papua New Guinea and not to that called “Solomon Islands”)!

Melobasina (s. str.) *fossicollis* (KERR.)

Exagistus fossicollis KERREMANS 1906: 415-414 [sic!].

MATERIAL EXAMINED

Holotype: „Tulagi, Salomones” [♀ (KBIN)].

REMARKS

Very similar to – perhaps a subspecies of – *M. apicalis* KERR., but differs in: perceptibly slenderer body (L:W≈3.00 as compared to 2.92); green (vs. cupreous) vertex, pronotum, and almost all ventral side; lack of ^-shaped frontal relief; shorter scutellum; distinctly (though slightly) “caudate” elytra; narrower prosternal process; coarser ventral puncturation. Some of these differences may prove purely individual, but it seems unlikely that all are, so – in accordance with my general practice, explained e.g. in HOLYŃSKI 2009b – pending the evidence to the contrary I prefer to treat *M. fossicollis* (KERR.) as taxonomically different from *M. apicalis* KERR. By the way, BILÝ & al. (2009) erroneously give the type-locality of this taxon as Shortland I., while in fact it has been described from Tulagi I. near the opposite (SE) end of the Solomon Archipelago, between Malaita and Guadalcanal. The mistake was evidently caused by confused order of pages in KERREMANS (1906) (they should correctly be read in the sequence 413→415→414→416) what has “substituted” the end of the description of “*Exagistus fossicollis* nov. sp.” [based on “*Un seul exemplaire de l’île Tulagi (Salomons)*”] with that of “*Chrysobothris Bennigseni* nov. sp.” [to which the remark quoted by BILÝ & al. (2009) “2 exemplaires, des îles Shortland” actually refers]. Moreover, these authors write (and repeat on other places of their work) that “*HOLYŃSKI (1993: 27) most probably studied specimens from Guadalcanal deposited in BMNH and determined by B. Levey as ‘Melobasina fossicollis Kerr.’*” – I do not know what is the basis of such supposition: in fact I did, indeed, examine two specimens determined (my notes do not specify by whom) as *Melobasina fossicollis* KERR. in BMNH from Wanderes Bay, but they had “all the elytra dark greenish-blue” and it was evident to me that they do **not** represent this species (I have even specially remarked that “according to the description [they

should be] *cupreous-greenish transgressing into dark violaceous-purplish posteriorly*"; in fact, they seem to represent *M. chrysocyanea* sp. n.) while my remarks in HOLYŃSKI (1993) were based on the specimen borrowed (among unidentified material!) long ago from KBIN. This specimen, agreeing in every detail with the original description and bearing the old label "Tulagi, Salomones", is beyond reasonable doubt the "lost" holotype of *Exagistus fossicollis* KERR.!

***Melobasina* (s. str) *chrysocyanea* sp. n.**

MATERIAL EXAMINED

Holotype: "SOLOMON IS., *Guadalcanal, Matanikau R., 6.viii.1958, P.G.Fenemore*" [♀ (RBH: Bpkcp)]

DESCRIPTION

Holotype: Female, 11.8×3.8 mm. Front dull blackish-green, vertex dark brown; pronotum bright golden-cupreous; elytra dark-greenish-blue, becoming almost black apically, with very indistinct dark-bronzed perisutural band covering 4 inner interstriae in posterior half but narrowed to only 1. in basal fifth; ventral side green, with bronzed episterna, metacoxae, and sides of 1.-4. sternites; apex of anal sternite blackish-violaceous; femora and tibiae blackish with strong green or bronzed shine, tarsi greenish-blue; antennae black. Pronotum and median parts of elytra glabrous, otherwise pubescence short, sparse and inconspicuous, erect on front and prosternal process, recumbent on rest of ventral side; no femoral brushes.

Epistome broadly and shallowly emarginate, separated from almost imperceptibly trapezoidal front with fine and irregular transverse carinula; front evenly convex, finely, rather densely, regularly punctured; vertex wide (VW:HW≈0.6), sharply grooved along midline. Antennae short, reaching to *ca.* anterior third of pronotal margins; 1. joint club-shaped, *ca.* 2× longer than thick; 2. twice thinner and thrice shorter, ovate; 3. as thin as 2. but as long as 1.; and 4. subcylindrical, still somewhat thinner, as long as 1.; 4. equal in length to 3. but elongately triangular; 5.-10. slightly wider than 5., progressively shorter (10. not quite as long as wide); 11. ovate, as long 10. but slightly narrower.

Pronotum transverse (BW:AW:L≈1.5:1.2:1); basal margin moderately bisinuate, prescutellar lobe regularly arcuate; posterior angles distinctly acute; sides sinuately subparallel to midlength, then slightly convergent to distinct "collar"; apical margin shallowly bisinuate. Furrow along apical margin laterally deep, interrupted at middle; on each side at basal third deep, obliquely transverse impression; median line smooth, disk otherwise covered with fine (somewhat coarser on anterior third) and sparse, regular punctures becoming much coarser and denser at sides; lateral carina almost entire. Scutellum small, *ca.* twice wider than long.

Elytra (L:W≈2.3) sinuately parallelsided to midlength, then arcuately, and just before apices again subsinuately (slightly "caudate") tapering to apices; epipleura totally vanishing behind metacoxae. 1. stria continuous, very fine and almost imperceptibly punctulate; 2.-4. represented by rows of separate punctures in basal half, deeply depres-

sed and but inconspicuously punctulate towards apex; 5.–8. similar but not continuous even posteriorly; three lateralmost rugulose and confused especially in apical part; punctures in striae 2. (basally) – 11. coarse; interstriae generally flat. Lateroposterior elytral margins prominently denticulate, three apical denticles sharply acute.

Anterior margin of prosternum shallowly emarginate; prosternal process finely and densely punctulated, bordered with deep furrows separating narrow (narrower than furrow) smooth lateral rim from also impunctate middle; proepisterna lustrous, coarsely and sparsely punctured anteriorly, practically smooth behind; metasternum sulcate along midline, rather finely and sparsely punctulate at middle, coarser and sparser on sides; metacoxae without denticle, deeply sulcate along posterior margin; 1. sternite regularly convex, rather finely and sparsely punctured at middle, punctures become finer and still sparser towards sides and apex of abdomen; apex of anal sternite with three spiniform (lateral two carinulate) denticles of nearly equal length.

GEOGRAPHICAL DISTRIBUTION

Solomon Is.: Guadalcanal; known only from the holotype [though the two BMNH specimens from “Wanderers Bay”, mentioned by BILÝ & al. (2009) under *M. apicalis* KERR., probably also belong here).

REMARKS

Very closely related to *M. solomonensis* (THY.) which – judging from the original description and pictures in BILÝ & al. (2009) – seems to differ mostly in dark-blue colouration of pronotum and ventral side and in some minor details like not “caudate” elytra and, perhaps, “*feeble transverse depression between the eyes*” [however, comparing his species with “*N[osotrinchus].*” *coeruleipennis* FAIRM., THÉRY (1937) writes of “*front without depression*”...]. Considering that the taxonomic differences within *Melobasina* KERR. are generally slight except just colouration, the recognition of the Guadalcanal form as a new species seems warranted – the more so that Tulagi I., geographically intermediate between Malaita [from where *M. solomonensis* (THY.) had been described] and Guadalcanal, is inhabited by clearly different *M. fossicollis* (KERR.).

***Melobasina* sg. *Nesotrinchus* OBB.**

Nesotrinchus OBERBERGER 1924: 12-13.

Type species: *Nesotrinchus simondsi* OBERBERGER 1924: 13-14.

As mentioned above, *Nesotrinchus* OBB. is no more than a subgenus of *Melobasina* KERR. It is not easy to understand how VOLKOVITSH (2001) could have “*confirmed Nesotrinchus as a valid genus*” (BILÝ & al. 2009) if – as the Authors themselves point out one line above – “*Pseudhyperantha Saunders, 1869 and Melobasina* [boldface mine – RBH] *were not studied*”??? Also confusing is the statement that “... *frons of Melobasina species is ... much wider than that of Nesotrinchus, and the latter genus also possesses well-developed supraantennal carinae ...*”: the specimens before me do not

show any “palpable” difference in these characters, nor is such difference discernible on their photographs. They also write (and repeat at several places of their paper) that “BELLAMY (1997: 76, resp. 2002: 62) interpreted this comment [“*Nesotrinchus* OBB. ... in my view, cannot be separated even as a subgenus, ‘*N.*’ *coeruleipennis* (THS.) being much more closely related to *M. fossicollis* KERR. than to ‘*N.*’ *australicus* (KERR.)” in HOLYŃSKI 1993] as a synonymisation of *Melobasina* and *Nesotrinchus* Obenberger, 1924 but this interpretation is wrong”, and again I am unable to see how my statement could be interpreted otherwise? – yes, at that time I indeed considered these names as synonymous (even if **now** I am inclined to accept the latter as a subgenus of the former – but anyway certainly not “as valid genus”!); it was not BELLAMY (1997, 2002) but just BILÝ & al. (2009) who misinterpreted my intentions!

KEY TO SPECIES

- 1(4) Pronotal sides smoothly convergent
 2(3) Elytra, except tips and posterior part of suture, purplish throughout. Pronotal sides practically straight from basal fifth to apex. Lateral margins of elytra just before apices slightly but discernibly divergent *coeruleipennis* (FRM.)
 3(2) Basal 3/5 of elytra purplish, apical 2/5 dark greenish-blue. Pronotal sides slightly but distinctly arcuate in apical 4/5. Lateral margins of elytra convergent (even if almost imperceptibly) to the very apices *thomsoni* (B.K.V.)
 4(1) Lateral margins of pronotum with prominent tubercle at midlength
 *australicus* (KERR.)

***Rhabdolona* OBB.**

Rhabdolona OBBENBERGER 1924: 14-15.

Type species: *Haplotrinchus strandi* OBBENBERGER 1922: 79.

REMARKS

OBBENBERGER (1922) described the type-species as *Haplotrinchus* KERR., but “*nur mit Vorbehalt*”, because it looked to him like “*eine Halecia mit stark zugespitzten, am apikalen Außenrande ungezähnten Flügeldecken*” and might be a separate genus “*die Naher zu Halecia als zu Dicercomorpha zu stellen wäre*”; two years later (OBBENBERGER 1924) he indeed established the genus *Rhabdolona* OBB., with remarks that it “*ressemble beaucoup à un Halecia ou à un large Cinyra brillant, lisse et luisant. Il appartient à la tribu VIII. Buprestini sensu Kerremans, et au Groupe I. Dicerctes de même auteur*” and that, though “*Rhabdolona Strandii m. fut originairement décrite par moi comme Haplotrinchus*”, in fact it “*s’eloigne des genres du voisinage de Haplotrinchus notamment par le forme du dernier article des palpes*”. In TÖYAMA’S (1994) opinion the genus “*must be ... transferred to the tribe Buprestini from the Dicerctini*” [what, in the frames of my (HOLYŃSKI 1993) classification would suggest the placement in the **Euplectaleciina** HOL. rather than

Haplotrinchina HOL.] but his arguments are weak: maxillary palpi also in *Haplotrinchus* KERR. are not always “compact and distinctly enlarged apically”, while interpretation of presence or absence of anal cell is by far not so unambiguous (see e.g. the remarks on BELLAMY 1989 in HOLYŃSKI 1993) as followers of “VIC-taxonomy” usually suppose. My notes on the type made decades ago are brief and superficial, and I have never seen any other specimen attributed or attributable to this genus, so I have no established opinion as to its systematical placement. General habitus and unidentificate elytra resemble indeed an *Euplectalecia* OBB. (separated from *Halecia* C.G. by OBENBERGER himself four pages earlier in the same paper), but other characters enabling the unequivocal attribution of the genus to either **Euplectaleciina** HOL. or **Haplotrinchina** HOL. are not evident from the description or picture. Anyway, if the phylogenetic affinity of Sumatran *Rhabdolona* OBB. to Neotropical *Euplectalecia* OBB. is confirmed, this would be extremely intriguing biogeographical puzzle!

***Haplotrinchus* KERR.**

Haplotrinchus KERREMANS 1903: 126.

Type species: *Buprestis viridula* OLIVIER 1790: pl. 10, f. 112.

KEY TO SUBGENERA

- 1(2) Sides of prothorax not carinate. Elytra without dfp depressions. Tarsi ferrugineous sg. n.? [*H.splendens* WATH.]
- 2(1) Lateral carina of prothorax distinct. If tarsi ferrugineous then elytra with conspicuous dfp depressions
- 3(4) Lateral depression of pronotum long (usually extending to apical margin); depressions on dorsal side conspicuously dfp and abundantly pulverulent. Colouration blackish with bluish or purplish shine, or punctures on pronotal disk very sparse (separated from one another by much more than their diameters) *Transwallacea* sg. n.
- 4(3) Laterobasal depression short (not or but insignificantly extending beyond midlength); pronotal and elytral depressions not distinctly dfp and but rarely pulverulent. Colouration bright green to bronzed-cupreous. Pronotal disk moderately to densely punctured, with interspaces subequal to diameters of punctures *Haplotrinchus* KERR. s. str.

***Haplotrinchus* (sg. n.?) *splendens* WATH.**

Haplotrinchus splendens WATERHOUSE 1913: 182.

REMARKS

The characters mentioned in the key do not allow to include this species into either of the named subgenera. Having examined the type specimen in the BMNH in 1978

I noted only “*Looks very atypical for a Haplotrinchus, resembles rather a Melobasina but stout*”, what could suggest the affinity to *Melobasina (Ulaikoilia* B.K.V.) unknown to me at that time; however, its geographical distribution (Fiji), ferruginous tarsi mentioned in the original description, as well as smooth lateroposterior elytral margins and distinct frontal depression apparent from the internet picture, seem more consistent with *Haplotrinchus* KERR., and – no specimen having been now available to me for examination – I cannot verify its systematic position.

***Haplotrinchus* sg. *Transwallacea* sg. n.**

Type species: *Dicercomorpha marginefossa* THOMSON 1878. Gender: feminine.

CHARACTERS

Besides the diagnostic characters mentioned in the key, various species differ from the nominotypical subgenus in reduced oblique frontal ridges, presence of prominent triangular relief at middle of front, elevated marginal pronotal ridge, ferruginous tarsi, and/or some other details.

GEOGRAPHICAL DISTRIBUTION

The species belonging here occupy the southeastern part of the genus' distribution area, occurring from New Guinea through Solomons and New Hebrides to Fiji.

KEY TO SPECIES

- 1(6) Pronotal sides normally punctured, without smooth ridge separating later[obas]al depression from marginal groove.
- 2(5) Front above the anterior fossa with a prominent elevated relief or pair of reliefs. Pronotum deeply sulcate along midline
- 3(4) Front above the anterior fossa forming a large, triangular, smooth, elevated relief, extending as narrow medially striated ridge on vertex and leaving only narrow densely punctured stripes along eyes. 1. sternite regularly convex *embrikiellus* OBB.
- 4(3) Front above the anterior fossa with pair of oblique reliefs, separated from one another and from narrow ridge on vertex. 1. sternite narrowly sulcate along midline *connectens* sp. n.
- 5(2) Front without [?] distinct relief. Pronotal disk not distinctly sulcate *pooli* THY.
- 6(1) Sides of pronotum (at least in basal half) smooth, forming elevated ridge running along lateral margin
- 7(8) Front with large triangular smooth relief at middle *pyrochlora* (FRM.)
- 8(7) Front without median relief
- 9(12) Pronotum and elytra blackish, nearly concolorous. Pronotal depressions becoming much shallower and narrower before midlength, or fully disappearing in apical third. Elytral interstriae definitely convex

- 10(11) Perimarginal ridge between lateral depression and pronotal margins wide, entire, not distinctly narrowed anteriorly. Lateroapical sides of elytra convergent up to apices *amicorum* sp. n.
- 11(10) Ridge separating laterobasal depression from pronotal margin narrow, irregular, anteriorly disappearing. Lateral denticle of elytral apex pointing somewhat outwards, its outer margins slightly divergent *manni* THY.
- 12(9) Pronotum bright-bronzed, contrasting with dark-blue elytra. Pronotal depressions of subequal width and depth all along, broadly reaching anterior margin. Elytral interstriae flat *marginifossa* (THS.)

Haplotrinchus (Transwallacea) connectens sp. n.

MATERIAL EXAMINED

Holotype: "Timika, W. PAPUA, INDONESIA, *V. 02*, Coll. Alain CHAMINADE"
[♂? TNS].

DESCRIPTION

Holotype: Male, 13.6×5.2 mm. Both dorsal and ventral side dull-green, dfp depressions on pronotum golden-aeneous, on elytra cupreous-red, on abdomen nearly concolorous, femora and tarsi greenish-blue, tibiae partly purplish; dfp areas covered with short, recumbent, not very dense yellowish pubescence and pulverulent; prosternal process with rather long, erect, sparse and inconspicuous white setulae, rest of body nearly glabrous; no femoral brushes.

Epistome broadly arcuately emarginate, separated from trapezoidal front with fine transverse carinula joining anterior ends of supraantennal carinae; frontal depression deep, transversely elliptical, coarsely but sparsely punctured; frontal ridges represented by pair of prominent, lustrous, obliquely elliptic tubercles narrowly separated from one another and from narrow smooth ridge running along midline of vertex and upper part of front; rest of surface rather coarsely and densely punctured. Vertex relatively narrow (VW:HW≈0.2). Antennae long, slender; 1. joint club-shaped, *ca.* twice longer than thick; 2. much thinner and half as long, ovate; 3. and 4. subcylindrical, as long as 1. but *ca.* 3× thinner; 5. as long as 4, elongately triangular; 6.-10. slightly wider than 5., progressively shorter (10. *ca.* as long as wide) and more rounded on outer angle.

Pronotum transverse (BW:AW:L≈1.7:1.2:1); prescutellar lobe very slightly protruding, broadly trapezoidal, occupying median third of pronotal base; basal margin to both sides straight, very slightly oblique so that right basal angles of pronotum and "apex" (posterior margin) of the lobe lie at the same level; sides slightly, arcuately divergent to basal 2/5, then convergent to moderately distinct "collar"; apical margin very slightly bisinuate. Furrow along apical margin (accentuating "collar") laterally deep but very broadly interrupted; median line narrowly sulcate; lateral dfp depression broad and deep in basal half, becomes somewhat narrower and shallower anteriorly but extends from base to "collar", narrow space between depression and lateral margin somewhat elevated but rather coarsely and densely punctured; puncturation of disk similar but leaving a pair of irregular, almost smooth, not elevated spaces near base to

both sides of median sulcus. Lateral carina almost entire. Scutellum relatively large, cordiform, almost twice wider than long, convex, smooth and lustrous.

Elytra (L:W \approx 2.0) rounded at humeri, subparallelsided to midlength, then arcuately, and in apical tenth sinuately (“caudate”) tapering to tridentulate apices; epipleura very narrow but traceable to just before apex. Striae continuous, deep, rather coarsely punctured; interstriae convex, impunctate; each elytron with several sharply defined, deep dfp depressions: transversely arcuate basal between 1. (short periscutellar not counted) stria and humeral protuberance, three (rounded anteriormost between 4. and 6 stria, somewhat semilunar, narrowly connected to the former, between 5. stria and lateral margin, and the smallest, rounded, slightly behind the level of the previous, on 3. and 4. interstriae) arranged in triangle behind humeri, large just before midlength between 3. and 8. striae, smaller and somewhat irregular behind midlength on 2.-3. interstria, again large on posterior third between 4 stria and lateral margin, narrowly cuneate just behind or (on right elytron) connected to it on 2-3 lateral interstriae, broadly cuneate between 5 stria and suture in apical 2/5 (the last two extending almost to apex), and some irregular linear in 1. and 10. (perimarginal) striae.

Anterior margin of prosternum narrowly but deeply emarginate at middle; prosternal process rather coarsely and densely punctulated, bordered with shallow groove running along smooth lateral rim; proepisterna lustrous, coarsely and densely punctured in basal half, almost smooth apically; metasternum sulcate along midline, coarsely but sparsely punctured at middle, much finer on sides; metacoxae without denticle, deeply sulcate along posterior margin; 1. sternite medially sulcate, rather coarsely but sparsely punctured at middle, punctures become finer and still sparser towards sides and apex of abdomen except for well defined laterobasal dfp patches on each sternite; apical angles of 2.-4. segment prolonged into small but prominent, sharply acute subtriangular lobes; sides of anal sternite almost straightly convergent to arcuately emarginated apex, apical lamella prominent, straightly truncated, reaching to midlength of long, almost spiniform lateral denticles.

GEOGRAPHICAL DISTRIBUTION

Known only from the holotype collected in western New Guinea: Timika [4°32'S-136°54'E].

REMARKS

The closest relative of *H. connectens* sp. n. is apparently the only other New Guinean (from eastern part of the island) species, *H. embrikiellus* OBB. which, however, besides unmistakable structure of front (large triangular smooth relief at middle), differs in size (larger), colouration (at least pronotum purplish-cupreous), lacking lateroposterior cuneate dfp patch on elytra, regularly convex (without median sulcus) 1. sternite, &c. *H. pooli* THY., unknown to me in nature, has been described from “*Océanie et probablement Iles Fidji*” and seems to be separable by lack of smooth frontal tubercles above anterior depression, regularly convex pronotal disk, and “*presque lisse*” prosternal process.

Haplotrinchus (Transwallacea) amicorum sp. n.

MATERIAL EXAMINED

Holotype: „SOLOMON IS, Guadalcanal, *Tigakvavatu*, 8/8.1963, P. GREENSLADE, 8427” [♂ RBH: BPcxb].

DESCRIPTION

Holotype: Male, 13.8×5.2 mm. Dorsal side black with bluish and purplish reflexions; pronotal sides (incl. outer parts of lateral dfp depressions) and all ventral surface dull-green; labrum, basal antennomeres, bottoms of frontal punctures, poorly defined periscutellar area, inner zone of pronotal and entire elytral dfp depressions purplish-cupreous; distal joints of metatarsus testaceous (other tarsi missing). Dfp areas covered with short, recumbent, very dense white pubescence and pulverulent; prosternal process with rather long, erect, white setulae, rest of body nearly glabrous; no femoral brushes.

Epistome deeply semicircularly emarginate, separated from trapezoidal front with fine transverse carinula joining anterior ends of supraantennal carinae; frontal ridges reduced to pair of small lustrous tubercles connected transversely by smooth but not elevated strip; frontal depression deep, extending far into vertex, rather coarsely and densely punctured. Vertex relatively wide (VW:HW≈0.3). Antennae long, slender; 1. joint club-shaped, *ca.* 2.5× longer than thick; 2. much thinner and twice shorter, ovate; 3. and 4. subcylindrical, still somewhat thinner, as long as 1.; 5. as long as 4, elongately triangular; 6.-10. slightly wider than 5., progressively shorter (10. *ca.* as long as wide).

Pronotum transverse (BW:AW:L≈1.6:1.1:1); basal margin moderately bisinuate, prescutellar lobe truncated; posterior angles right; sides very slightly subsinuately divergent in basal half, then arcuately convergent to moderately distinct “collar”; apical margin very slightly bisinuate. Furrow along apical margin (accentuating “collar”) laterally deep but very broadly interrupted; median line undifferentiated; on each side well defined broad dfp depression extends from base to “collar”, limited laterally with smooth elevated ridge; lateral carina almost entire; disk covered with moderately coarse, rather sparse, irregular punctures. Scutellum relatively large, cordiform, slightly wider than long, strongly convex, with microsculptured central depression fully encircled by smooth and lustrous elevations.

Elytra (L:W≈1.9) rounded at humeri, subparallelsided to midlength, then arcuately, and in apical 1/7 sinuately (“caudate”) tapering to tridenticulate apices; epipleura very narrow, totally vanishing in apical third. Striae continuous, deep, inner three rather finely, others coarsely punctured; interstriae strongly (5. apically and 9. throughout careniform) convex, impunctate except for few very fine punctures here and there; each elytron with five sharply defined, deep dfp depressions: transverse basal – divided by smooth 3. interstria – between 1. stria and humeral protuberance, rounded posthumeral at anterior fourth between 4. and 8. striae, also rounded mid-discal just before midlength between striae 4. and 7., small elongately ovate lateroposterior at apical third between 6. and 9. striae, and similar preapical at posterior fourth limited by striae 2. and 5.

Anterior margin of prosternum narrowly emarginate at middle; prosternal process finely and densely punctulated, bordered with shallow groove running along smooth lateral rim; proepisterna lustrous, coarsely and sparsely punctured; metasternum sulcate along midline, finely (densely in anterior part, less so posteriorly) punctulate at middle, coarser and sparser on sides; metepisterna deeply depressed; metacoxae without denticle, deeply sulcate along posterior margin; 1. sternite medially sulcate, rather coarsely but sparsely punctured at middle, punctures become finer and still sparser towards sides and apex of abdomen except for well defined laterobasal dfp patches on each sternite; posterior margin of 1. segment rather deeply emarginated laterally between apical angle and lateral third, apical angles of 2.-4. prolonged into small but prominent, sharply acute subtriangular lobes; sides of anal sternite almost straightly convergent to (very widely trapezoidally emarginated between short but sharply acute lateral denticles) apex. Parameres dark brown, narrow, almost parallelsided; penis testaceous, sharply acute at apex.

GEOGRAPHICAL DISTRIBUTION

Solomon Is.: Guadalcanal; known only from the holotype.

REMARKS

Apparently closely related to *H. manni* THY. which, however, differs (besides those features mentioned in the key) also in colouration (dorsal side brownish-green; pronotal sides, pdf depressions on elytra, and undersurface dark-green); the specific distinctness is further supported by widely disjunct (respectively Solomons and Fiji) distribution.

Haplotrinchus KERR. s.str.

KEY TO SPECIES

[The description of *H. aurocupreus* (KERR.) does not enable it to be included in the key: green colouration and (according to my old notes from BMNH) narrow vertex suggest placement in the nominotypical subgenus but even this is not sure, as distinct pulverulent depressions on pronotum and elytra as well as distribution are consistent rather with *Transwallacea* HOL.]

- 1(8) Pronotum at basal fifth or fourth, and elytra at midlength, wider than, or at least as wide as, at base
- 2(7) Punctuation of pronotal disk rather dense, median line more or less deeply depressed or at least differentiated by denser and usually finer punctulation. Lateral carina without angular expansion, sides in basal third rounded or straight.
- 3(4) Colouration pure-green to aeneous-green *inaequalis* (DEYR.)
- 4(3) Colouration bronzed to bronzed-cupreous
- 5(6) Pronotum with smooth relief just before each laterobasal fossa. Vertex narrower (VW:HW≈0.2 in male, 0.3 in female) *incertus* sp. n.
- 6(5) No smooth relief before laterobasal fossa on pronotum. Vertex relatively wide (VW:HW≈0.3 in male, 0.35 in female) *borneanus* sp. n.
- 7(2) Disk of pronotum sparsely punctured, median line not distinguished in any way.

- Lateral carina of prothorax angularly expanded at basal third, from this point to base pronotal sides distinctly sinuate *viridis* (DEYR.)
- 8(1) Sides of pronotum convergent from base, sides of elytra from humeral protuberances
- 9(12) Pronotum with deep (though often developed only in basal half) median sulcus, additional basal foveolae on sides of prescutellar pit absent
- 10(11) Scutellum *ca.* 3× wider than laterally long. Median sulcus of pronotum deep to just before apex, gradually narrowed anterad. 1. metatarsomere as long as three following (including apical lobes). Vertex markedly dimorphic (VW:HW≈0.15 in male, 0.2 in female) *amplius* sp. n.
- 11(10) Scutellum less transverse: its width *ca.* 2× greater than length of lateral margins. Median sulcus ends or almost so at midlength, indistinct or at least much narrower in apical half. Dimorphism in vertex hardly discernible (VW:HW≈0.2 in both sexes) *semperi* THY.
- 12(9) Median sulcus on pronotum lacking or very indistinct; prescutellar pit accompanied with pair of additional foveae (sometimes connected by sulciform transverse depressions to laterobasal fossae) on both sides *viridulus* (OL.)

***Haplotrinchus* (s. str.) *inaequalis* (DEYR.)**

Key to subspecies

- a(d) Elytra blackish with strong metallic shine. Pronotum of mat appearance due to microsculpture or density of puncturation. Elytral depressions well defined, conspicuous
- b(c) Head and pronotum piceous-black, elytra bluish- to purplish-black, ventral side dark bronzed *negrophilus* ssp. n.
- c(b) Head and pronotum purplish-red, elytra dark plumbeous-green, ventral side aeneous-bronzed with some greenish and cupreous parts. *pyrrhonotus* ssp.n.
- d(a) Elytra metallic green, bronzed or cupreous. Pronotum lustrous, weekly microsculptured and covered with not very dense puncturation. Elytral depressions shallow, poorly delimited
- e(f) Colouration bright-green. Body larger (length of males >14, of females >15mm.) *inaequalis* s. str.
- f(e) Colouration dull-green. Size smaller (males <14, females <15 mm.) *edai* OHM.

***Haplotrinchus* (s. str.) *inaequalis negrophilus* ssp. n.**

MATERIAL EXAMINED

Holotype: "PHILIPPINES Negros Isl., Mt. Canla-on, Don Salvador, 4.v.2009, local collector" "Ex. Coll. C.L.Bellamy (CLBC)" [purplish label] [♀ (CSCA)].

DESCRIPTION

Holotype: Female, 14×5 mm. Head and pronotum piceous-black; anterior third of elytral disk blackish-blue, sides and apical 2/3 dull-purplish; ventral side purplish-black with some bluish hue along midline. Dorsal side glabrous, ventral almost so (with traces of very short pubescence on prosternal process and dfp areas on sides).

Epistome broadly subtriangularly emarginate, separated from narrowly trapezoidal front by low but distinct transverse ridge; front coarsely and very irregularly punctured; oblique ridges prominent but also rather irregular. Vertex wide (VW:HW≈0.35). 1. antennomere thick (L:W≈2), club-shaped; 2. of similar shape but almost twice thinner; 3. subcylindrical, somewhat thinner but 1.5× longer than 2.; 4. similar but still somewhat longer; 5. slightly longer than 4, elongately triangular, more than twice longer than wide; 6.-10. of nearly equal width but progressively more rhomboidal and strongly diminishing in length (10. wider than long); 11. distinctly smaller but similar in shape.

Pronotum transverse (BW:AW:L≈1.7:1.2:1); basal margin bisinuate, with shallowly arcuate median lobe; basal angles right; sides subparallel in basal third, then regularly rounded to rather distinct but very short “collar” marked by transverse, broadly interrupted at middle, narrow groove; apical margin almost straight. Surface rather finely and densely, almost regularly punctured on sides and in median sulcus, punctures become somewhat coarser and much sparser to both sides of sulcus; prescutellar pit very shallow, inconspicuous; laterobasal depressions broad, deeper and elongate along sides, dfp; midlateral reliefs before them well defined, impunctate and lustrous; lateral carina reaching to anterior fourth, well developed, accentuated by deep furrow separating it from pronotal disk. Scutellum small, cordiform, very deeply submerged between mediobasal angles of elytra [artifact of preservation?].

Elytra (L:W≈2.2) roundedly oblique at humeri, subparallelsided in basal third, then arcuately narrowed to apical sixth and from there sinuately so (rather strongly “caudate”) to sharply tridenticulate (middle denticle very short and close to sutural apices; epipleura narrow, entire. Basal depressions very short except at inner side of narrow and prominent humeral protuberances; each elytron with three broad lateral (middle very broad and deep, sharply defined) and one elongate preapical (at suture) inconspicuously dfp depressions, supplemented by some small irregular ones; striae consisting of distinctly depressed rows of coarse (even lateroapically) punctures; interstriae slightly convex (except in largest depression), very finely punctulated.

Anterior margin of prosternum rather deeply triangularly emarginate at middle; prosternal process shallowly depressed anteriorly along midline, deeply furrowed lateroapically, coarsely, not very densely, irregularly punctured; puncturation of proepisterna coarse and rather sparse. Metasternum deeply depressed all along; puncturation sparse and rather fine at middle, much denser on sides; lateral part of metacoxae and anterolateral depressions on sternites dfp. Metacoxae without denticle, deeply depressed; 1. sternite flat along midline; apical angles of 2.-4. prolonged into small sharply acute denticles; apex of anal sternite widely but shallowly arcuate emarginate, apical lamella broad, lateral angles slightly acute.

GEOGRAPHICAL DISTRIBUTION

Philippines: Negros; known only from the holotype.

REMARKS

Unmistakable among *Haplotrinchus* KERR. s. str. in colouration; otherwise similar to *H. inaequalis* s. str. but differs in somewhat narrower body, more prominent humeral protuberances, coarser (esp. lateroapically) punctures in elytral striae, very conspicuous elytral depressions, more strongly and elongately caudate apices and some minor details.

Haplotrinchus (s. str.) *inaequalis* *pyrrhonotus* ssp. n.

MATERIAL EXAMINED

Holotype: "Philippines, Masbate, Aroroy" [♀: (RBH: BPkda)].

DESCRIPTION

Holotype: Female, 15.5×6 mm. Head and pronotum bright cupreous-red, sharply contrasting with dark plumbeous-green elytra; ventral side aeneous-bronzed with cupreous proepisterna and green median parts of meso- and metasternum; legs dull bluish-green. Pubescence on dorsal surface hardly appreciable, on ventral side also practically restricted to dfp depressions and short sparse semierect pilosity of prosternal process; depressions of both dorsal and ventral side with rusty pulverulence. Pronotum and proepisterna conspicuously microsculptured, mat, rest of body lustrous.

Epistome broadly semicircularly emarginate, not clearly separated from narrowly trapezoidal front; frontal puncturation coarse and sparse in median depression, much finer and denser otherwise; oblique ridges prominent but rather irregular. Vertex narrow (VW:HW≈0.28). 1. antennomere short (L:W≈2), club-shaped; 2. twice thinner and shorter, ovate; 3. subcylindrical, somewhat thinner but 1.5×longer than 2.; 4. as thin as, but again somewhat longer than, 3.; 5.-7 similar in length to 4. but elongately triangular; distal joints missing.

Pronotum transverse (BW:AW:L≈1.8:1.2:1); basal margin almost straight on lateral thirds, with arcuately prominent median lobe; basal angles slightly obtuse; sides regularly rounded; apical margin very slightly bisinuate. Surface rather coarsely and not very densely (much finer but denser in conspicuous median sulcus and broad deep laterobasal depressions), somewhat irregularly punctured; prescutellar pit deep, furrow along anterior margin broadly interrupted at middle; midlateral reliefs at anterior third poorly defined; lateral carina extending to apical fifth, sharp, accompanied dorsally with narrow, finely punctulated groove. Scutellum transversely cordiform, strongly convex, smooth and lustrous.

Elytra twice longer than wide, somewhat unevenly subparallelsided in basal half, then arcuately narrowed to apical tenth and sinuately so to sharply tridentate apices (distinctly "caudate"); epipleura narrow but entire. Surface uneven due to two deep but irregular basal, three broad well developed and some smaller and poorly defined

depressions on each; inner two striae continuous, others not depressed, all rather coarsely punctured; interstriae almost flat, very finely and sparsely, inconspicuously punctulated, depressions indefinitely dfp.

Anterior margin of prosternum narrowly subtriangularly emarginate at middle; prosternal process rather coarsely and densely punctured at base, sparsely in apical part, laterally bordered with deep furrow; puncturation of proepisterna moderately coarse and rather sparse, similar to that all-over ventral side except dfp depressions on lateral parts of metacoxae and laterobasal areas of abdominal segments; median sulcus of metasternum widened backwards; metacoxae without denticle, deeply sulcate along posterior margin; 1. sternite flat with faint indication of median sulcus; apical angles of 2.-4. prolonged into small, sharply acute subtriangular lobes; apex of anal sternite widely but shallowly trapezoidally emarginate, lateral angles right.

GEOGRAPHICAL DISTRIBUTION

Philippines: Masbate; known only from the holotype.

REMARKS

Very closely related to *H. inaequalis* s. str., which however differs in colouration (brighter green dorsally, with pronotum at most anteriorly cupreous-red), microsculpture (indistinct throughout), elytral depressions (poorly defined, not or but indistinctly dfp), punctulation of interstriae (very inconspicuous), sculpture of prosternal process (puncturation at most slightly sparser apically than at base) and some minor details.

Haplotrinchus (s.str.) *inaequalis inaequalis* (DEYR.)

Material examined

1 ♂, 7 ♀, 18 ♂.

GEOGRAPHICAL DISTRIBUTION

Moluques (Buru, Amboine, Ceram, Batchian, Morotai); Philippines (Mindanao, S-Luzon); 1 ex. in BMNH labelled "Sumatra" was certainly either introduced or mislabelled.

REMARKS

Male 14×5, females [13×5] 15.5×5.5-17×6.5 mm. [unfortunately specimens from BMNH, KBIN and NNHM, examined but not sexed several years ago, are unavailable for re-examination, but judging from the measurements (14.5×5.5-19.5×7 mm. in case of 13 ♂ from KBIN and NNHM) and proportion of sexes among those available, few, if any, of them were males. The only Philippine specimens [3 from Mindanao (coll. BAKER), and 1 from LUZON (coll. HADDEN)] – all females in the USNM – are smaller (13×5-15.5×6 mm.) than three from Moluques (16.5×6-18×7 mm.), and the specimen from Luzon is exceptional also in colouration (head and anterior 2/3 of pronotum bright carmine-red); whether this represents geographical or only individual variability remains uncertain with so scanty material at hand.

Haplotrinchus (s. str.) inaequalis edai OHM.

MATERIAL EXAMINED

12 ♂, 7 ♀.

DESCRIPTION

Holotype: Male, 13.5×5 mm. Both dorsal and ventral side uniformly dull-green with strong aeneous shine, lustrous. Dorsal pubescence indistinct except in dfp depressions; ventral dense in dfp, sparse but conspicuous otherwise, recumbent except on prosternal process where it is very short but erect; indistinct traces of rusty pulvulence in ventral dfp.

Epistome broadly subtriangularly emarginate, separated from narrowly trapezoidal front by low but distinct transverse ridge; front coarsely and very irregularly punctured; oblique ridges prominent but not quite regular. Vertex narrow (VW:HW≈0.2). 1. antennomere short (L:W≈2), club-shaped; 2. ovate, slightly more than half as wide and *ca.* half as long; 3. and 4. subcylindrical, somewhat thinner but 1.5× longer than 2.; 5. equal to 4. in length, elongately triangular, less than twice longer than wide; 6.-10. progressively shorter (10. barely longer than wide) and more rhomboidal; 11. as long as, but narrower than, 10., ovate.

Pronotum transverse (BW:AW:L≈1.7:1.2:1); basal margin bisinuate, with shallowly arcuate, truncated at scutellum, median lobe; basal angles right; sides shortly subparallel before base, then regularly rounded to distinct “collar” marked by transverse, broadly interrupted at middle, narrow groove; apical margin shallowly bisinuate. Surface rather finely and densely, almost regularly punctured on sides and in median sulcus, punctures become somewhat coarser and much sparser to both sides of sulcus; prescutellar pit shallow, inconspicuous; laterobasal depressions elongate, dfp; midlateral reliefs before them well defined, impunctate and lustrous; lateral carina reaching to anterior third, well developed and separated by deep furrow from pronotal disk. Scutellum cordiform, by half wider than long, strongly depressed, smooth and lustrous.

Elytra (L:W≈2.1) rounded at humeri, subparallelsided in basal fourth, then almost imperceptibly narrowed to midlength and definitely, arcuately so to apical tenth, distinctly sinuate (“caudate”) just before sharply tridentate apices; epipleura very narrow, entire. Surface uneven due to two deep basal, three broad lateral and one elongate preapical (at suture) inconspicuously dfp depressions on each; striae consisting of not depressed rows of punctures (inner rather fine, laterodiscal coarser, lateralmost again fine); interstriae flat, very finely punctulated.

Anterior margin of prosternum shallowly but distinctly emarginate at middle; prosternal process regularly, evenly, neither very coarsely nor very densely punctured, laterally bordered with deep regular furrow; puncturation of proepisterna moderately coarse and rather sparse, anterior third almost smooth; metasternal sulcus finely and densely, otherwise median parts of sternum and abdomen rather coarsely and sparsely, sides finer and denser punctured; lateral part of metacoxae and anterolateral depressions on sternites dfp. Metepisterna longitudinally depressed; metacoxae without denticle, deeply sulcate along posterior margin; 1. sternite regularly convex; apical angles of 2.

– 4. prolonged into small, acute denticles; apex of anal sternite widely but shallowly trapezoidally emarginate, lateral angles acute.

VARIABILITY

Males 12×4.5 – 14×5 [15.5×5.5 : Mindoro]; females [11.5×4.5] 13.5×5 – 14.5×5.5 [16×6 : Marinduque] mm. [OHMOMO (2002) gives (without separation by sex and/or locality) much wider range – 11.7 – 19.0×4.6 – 7.1 mm.]. Colouration varies between dull green to almost purely brownish-bronzed above, green with more or less conspicuous aeneous tinge below. Pronotal reliefs and elytral depressions more or less prominent but always distinct. The only conspicuous sexual difference is wider (V:H \approx 0.26) vertex in females.

GEOGRAPHICAL DISTRIBUTION

Philippines: Sibuyan, Romblon, ?Mindoro, ?Marinduque.

REMARKS

The above description has been based on the material available for study; some details (especially the range of size – see below) differ from the original description, but there is no serious doubt as to the taxonomic identity. Combination of small size, dull-green colouration and well developed laterodiscal reliefs on pronotum makes this race distinctive among members of the [*inaequalis*]-superspecies [unfortunately, OHMOMO (2002) compares the described taxon only with “*H philippinensis* OBENBERGER, 1926” – that name has been variously interpreted but in this case probably referred to *H. viridula* (OL.)]. Most similar to *H. inaequalis* s.str., the only apparent differences being somewhat duller colouration (usually brighter green in the Moluccan subspecies) and especially smaller size: except for the specimen from Mindoro, the largest examined male is still smaller than the only available male of the nominotypical race, and the beetle from Marinduque is the only female exceeding the size of the smallest (from Mindanao) female of the latter – however, the meaning of their “gigantism” is difficult to interpret without additional material from the respective islands [both exceptionally large specimens available to me are “extralimital”, and also OHMOMO’s (2002) series includes Mindoroan beetles (measurements of his holotype agree well with those from Sibuyan and Romblon examined by me)]. As the Philippines (three from Mindanao and one – somewhat aberrant – from Luzon) representatives of the nominotypical race are also exceptional in distribution and, in turn, the smallest of all, I include in the type-series only the Sibuyan – Romblon specimens.

Haplotrinchus (s. str.) *incertus* sp. n.

MATERIAL EXAMINED

Holotype: “Calayan is, North Luzon, July 2002” [σ] (RBH: BPkep); **Paratypes:** “PHILIPPINES, N.Luzon, Babuyan Is., v.2003, I.Lumawig” “Ex. Coll. C.L.Bellamy (CLBC)” [purplish label] [1σ , 1ϕ] (CLB); “Calayan is, North Luzon, July 2002” [σ] (RBH: BPkep); “*Haplotrincheus* [*sic!*] sp., PHILIPPINES, North Luzon, Babuyan

Island, V 2002" [♀ (RBH: Bpkie)]; "Camiguin Island, (N. Luzon) IV, 1999. Lumawig" [yellow label]"*Haplotrinchus inaequalis* H. Deyr. ?" "2027, U.Nylander" [green label] [1♀ (RBH: Bpkfc)]; "Philippines, Calayan Is., North Luzon., 2002, VIII. I. Lumawig, leg." "Haplotrinchus [*sic!*] sp." "♂" "3799, U.Nylander" [green label] [1♂ (UN)]; "Camiguin Island, (N. Luzon) IV, 2000. Lumawig" [yellow label]"Haplotrinchus [*sic!*] sp." [yellow label] "3798, U.Nylander" [green label] [1♂ (UN)]; "Philippines, Romblon June, 1989 Lumawig lgt" "Haplotrinchus viridula O.P.?" "2636, U.Nylander" [green label] [1♀ (UN)]; "Philippines, S. Leyte, St. Bernard, 28. 02. 1999" [♂ (RBH: Bpkif)].

DESCRIPTION

Holotype: Male, 13.5×5 mm. Head and pronotum bronzed-cupreous; elytra and ventral side bronzed; epistome, antennae and legs green. Surface lustrous, microsculpture not apparent. Dorsal side glabrous; ventral with short, erect along midline of sternum, recumbent otherwise, rather sparse (somewhat denser on poorly defined dfp areas on sides of metacoxae and sternites), whitish to yellowish pubescence; no meso- or metacoxal brushes, instead brush of short but very dense erect yellowish hair runs all along upper edge of metatibiae.

Epistome very broadly arcuately emarginate, separated from narrowly trapezoidal front only by very indistinct transverse ridge; front rather coarsely and very irregularly punctured; smooth oblique ridges prominent but poorly delimited. Vertex narrow (VW: HW≈0.2). 1. antennomere short (L:W≈2), club-shaped; 2. ovate, slightly more than half as wide and ca. twice shorter; 3. and 4. subcylindrical, somewhat thinner but 1.5× longer than 2.; 5. slightly longer, elongately triangular, ca. twice longer than wide; 6.-10. progressively shorter (10. barely longer than wide) and more rhomboidal; 11. as long as, but narrower than, 10., ovate.

Pronotum transverse (BW:AW:L≈1.8:1.2:1), widest just behind midlength; basal margin bisinuate, with shallowly arcuate median lobe; basal angles right; sides almost regularly arcuate in basal 2/3, then nearly straight and strongly convergent to distinct "collar" marked by transverse, broadly interrupted at middle, narrow groove; apical margin shallowly bisinuate. Punctures moderately coarse and rather sparse, finer and somewhat denser in median sulcus and laterobasal depressions; prescutellar pit rather deep; laterobasal depressions shallow and poorly delimited, of irregular shape; mid-lateral reliefs before them inconspicuous; lateral carina reaching to anterior third, well developed all along and accentuated by deep furrow separating it from pronotal disk. Scutellum cordiform, almost twice wider than long, convex, smooth and lustrous.

Elytra (L:W≈2.1) rounded at humeri, subparallelsided in basal fourth, then almost imperceptibly narrowed to midlength and definitely, arcuately so to apical tenth, distinctly sinuate ("caudate") just before sharply tridenticulate apices; epipleura very narrow, entire. Surface uneven due to six – two deep basal, three broad lateral and one elongate preapical (at suture) – inconspicuously dfp depressions on each; striae consisting of not depressed rows of rather fine punctures; interstriae flat, very finely but densely punctulated.

Anterior margin of prosternum shallowly emarginated and deeply depressed at middle; prosternal process regularly, evenly, neither very coarsely nor very densely punctured, laterally bordered with deep regular furrow; puncturation of proepisterna rather coarse but very sparse; metasternal sulcus and sides of metasternum and abdomen finely and densely, median parts somewhat coarser and sparser punctured; lateral part of metacoxae and anterolateral depressions on sternites dfp. Metepisterna longitudinally depressed; metacoxae without denticle, deeply sulcate along posterior margin; 1. sternite almost regularly convex; apical angles of 2.-4. prolonged into small, acute denticles; apex of anal sternite widely but shallowly trapezoidally emarginate, lateral angles acute.

VARIABILITY

Males 13.5×5-15×5.5, female paratypes 14×5-16×6, female labelled as “Romblon” 17×6.5 mm. Dorsal colouration often with strong cupreous hue, head and pronotum sometimes carmin-red; ventral side usually with bronzed-green or even definitely green. Pronotal reliefs small and sometimes inconspicuous but always discernible. Females distinguishable by wider (V:H≈0.3) vertex.

GEOGRAPHICAL DISTRIBUTION

Philippines: Camiguin, Calayan and Babuyan islands off North Luzon; the “Romblon” and “Leyte” specimens – if not mislabelled – shows that *H. incertus* sp. n. is rather widely distributed over the Philippine Archipelago.

REMARKS

Despite rather subtle and (except colouration) inconsistent differences, probable sympatric occurrence of this form with at least *H. i. edai* OHM. does not allow to consider it but one more subspecies of *H. inaequalis* DEYR.

Haplotrinchus (s. str.) *borneanus* sp. n.

MATERIAL EXAMINED

Holotype: “MALAYSIA: Sabah, Crocker Range, 900 m 19. iv. 2003, local collector” “Ex. Coll. C.L.Bellamy (CLBC)” [purplish label] [♂ (CSCA)]; **Paratypes:** “MALAYSIA: Sabah, Crocker Range, Mt. Trus Madi 1000m, N05°33'00” E116°31'00””, 16. iii. 2003 local collector” “Ex. Coll. C.L.Bellamy (CLBC)” [purplish label] [1♂ (RBH: BPkex) “MALAYSIA: Sabah, Crocker Range Mt. Trus Madi, N05°33'00” E116°31'00””, 4. v. 2004 local collector” “Ex. Coll. C.L.Bellamy (CLBC)” [purplish label] [1♀ (CLB)]; “MALAYSIA: Sabah, Crocker Range, vic. of Mt. Trus Madi, III/IV - 2001, local collector” “Ex. Coll. C.L.Bellamy (CLBC)” [purplish label] [1♀ (CLB)]; “MALAYSIA: Sabah, Crocker Range, 900 m 13. v. 2004, local collector” “Ex. Coll. C.L.Bellamy (CLBC)” [purplish label] [1♀ (RBH: BPkev)]

DESCRIPTION

Holotype: Male, 13×4.5 mm. Head and pronotum dark brown with some greenish and purplish reflexes; elytra bronzed; ventral side, legs and antennae dull-green.; epistome, antennae and legs green. Surface lustrous, microsculpture hardly appreciable. Dorsal side glabrous; ventral and head with very short, erect on front and along midline of sternum, recumbent otherwise, rather sparse (somewhat denser on poorly defined *dfp* areas on sides of metacoxae and sternites), whitish pubescence; no meso- or metacoxal brushes, instead brush of short but very dense erect yellowish hair runs all along upper edge of metatibiae.

Epistome broadly paraboloidally emarginate, separated from trapezoidal front by inconspicuous transverse ridge; front coarsely but not very densely and very irregularly punctured; smooth oblique ridges prominent but short, widely separated also at upper ends; frontal depression deep, its upper half impunctate. Vertex narrow (VW: HW≈0.3). 1. antennomere short (L:W≈2), club-shaped; 2. ovate, slightly more than half as wide and ca. twice shorter; 3. and 4. slightly club-shaped, somewhat thinner but 1.5× longer than 2.; 5. of similar length but as wide as 2., elongately triangular; 6.-10. progressively shorter (10. as long as wide), rhomboidal; 11. longer but distinctly narrower than 10., fusiform.

Pronotum transverse (BW:AW:L≈1.7:1.2:1), widest (but barely wider than base) at basal third; basal margin bisinuate, with shallowly arcuate median lobe; basal angles right; sides almost regularly arcuate from base to distinct "collar" marked by transverse, broadly interrupted at middle groove; apical margin shallowly bisinuate. Punctures moderately coarse, rather sparse on disk but much denser laterally; prescutellar pit rather deep; median sulcus deep in basal third, abruptly becoming shallow before; laterobasal depressions deep, obliquely (inwards) elongate; no midlateral reliefs; lateral carina reaching to anterior third, well developed all along and accentuated by deep furrow separating it from pronotal disk. Scutellum cordiform, by half wider than long, deeply transversely depressed, smooth and lustrous.

Elytra (L:W≈2.0) rounded at humeri, subparallelsided to midlength and definitely, arcuately tapering to apical tenth, distinctly sinuate ("caudate") just before sharply tridentate apices; epipleura narrow, entire. Elytral depressions shallow (humeral and premedian) to practically inappreciable; striae consisting of not depressed rows of moderately coarse punctures; interstriae flat, very finely but densely punctulated.

Anterior margin of prosternum shallowly emarginated and narrowly depressed at middle; prosternal process regularly, rather coarsely, not very densely punctured in anterior half, almost smooth apically, sides bordered with deep regular furrow; puncturation of proepisterna coarse, sparse, ocellate; metasternal sulcus and sides of abdomen finely and densely, median parts somewhat coarser and sparser punctured; lateral part of metacoxae and anterolateral depressions on sternites *dfp*, with grayish pulverulence. Metepisterna longitudinally depressed; metacoxae without denticle, deeply sulcate along posterior margin; 1. sternite regularly convex; apical angles of 2. – 4. prolonged into acute denticles; apex of anal sternite very widely but shallowly emarginate, lateral angles not protruding beyond apical lamella. Aedoeagus piceous-

brown parameres markedly widened in apical half (widest at apical third); apex of penis shortly, not very sharply mucronate.

VARIABILITY

Male paratype 12.5×4.5, females 15×5.5-17.5×6.5 mm. Dorsal side of paratypes (esp. females) brighter bronzed, with vertex and pronotum nearly to quite concolorous with elytra, front in females carmin-red. Median sulcus on pronotum usually deep all along, elytral depressions in one female somewhat more pronounced. Vertex in females wider (V:H≈0.35).

GEOGRAPHICAL DISTRIBUTION

Borneo: Sabah: Crocker Range.

REMARKS

The only Bornean representative of the genus (and, indeed, of the subtribe). Deceptively similar to *H. incertus* sp. n. but differs in lack of pronotal reliefs, wider vertex, indistinct elytral depressions, shape of aedoeagus and some minor details.

Haplotrinchus (s. str.) *amplius* sp. n.

MATERIAL EXAMINED

Holotype: "Philippinen, Luzon, *Imugan*" "*S. Boettcher*, 30.V.16" [reverse of label] "*Haplotrinchus viridula* (*Ol.*), det. R. Holyński, 1994" [♂ (RBH: BPghs)]; **Paratype:** "*Philippines*, *Coll. J. Blin*, 1987" [1 ♀ (TNS)]

DESCRIPTION

Holotype: Male, 15.5×5.5. Head cupreous-red; anterior half of pronotum and almost all ventral side golden-cupreous, pronotum transgressing basalwards into green, elytra, prosternal process, tibiae, tarsi and antennae green with golden-cupreous shine; epipleura green. Pubescence (especially on dorsal surface) inconspicuous, but elytra and pronotal and ventral dfp depressions with remnants of abundant ochraceous pulverulence; no trace of meso- or metafemoral brushes.

Epistome deeply semicircularly emarginate, finely and very densely punctulate, separated from front with fine transverse carinula joining anterior ends of supraantennal carinae which, in turn, meet at obtuse angle pair of prominent obliquely longitudinal ridges delimiting very deep bottle-shaped (narrow sulcus in upper half broadened into ovate fovea below) median depression; elevated ridges smooth, sides and depression rather finely and almost regularly punctured. Vertex very narrow (VW:HW≈0.15). Antennae long (reaching basal third of pronotal sides), rather slender; 1. joint club-shaped, *ca.* 3× longer than thick; 2. not much thinner, ovate; 3. somewhat flattened, definitely thinner but slightly longer than 2., twice longer than wide; 4. subcylindrical, 1.5× longer than 3.; 5. longest, elongately triangular; 6.-7. similar but slightly wider apically; 8.-10. progressively shorter, rhomboid; 11. rhomboidally ovate, somewhat longer than 10.

Pronotum transverse (BW:AW:L \approx 1.6:1.1:1); basal margin moderately, apical slightly bisinuate; basal angles right; sides almost regularly strongly arcuate to conspicuous “collar” accentuated by well defined sulcus running along lateral thirds of anterior margin; median sulcus well developed, uninterrupted (though shallower at midlength); prescutellar pit single; transverse prebasal and longitudinal lateral depressions deep; no trace of mid-discal foveae. Pronotal punctulation fine, almost regular. Lateral carina extending to anterior third, well developed all along and accentuated by deep furrow separating it from pronotal disk. Scutellum transversely cordiform, twice wider than long, strongly convex, smooth and lustrous.

Elytra (L:W \approx 2.1) rounded at humeri, shortly (to *ca.* apical margin of metasternum) parallelsided behind them, sinuately tapering to just before midlength, more strongly arcuately so to apical tenth and again sinuately (what gives them “caudate” appearance) to sharply tridenticulate apices; epipleura very narrow throughout. Striae continuous, inner two finely, others rather coarsely punctured; inner interstriae slightly, lateral ones more strongly convex; each elytron looking “uneven” because of (beyond two deep basal, two indefinite, broad but shallow lateral depressions in basal half and smaller, less distinct one at apical 2/5).

Anterior margin of prosternum shallowly emarginate at middle; prosternal process coarsely but rather sparsely punctured, bordered with indefinite furrow-like depression (no distinct stria) running along smooth lateral rim; proepisterna lustrous, very sparsely finely punctulate; metasternum sulcate along midline, finely and sparsely punctured at middle, more densely on sides, punctulation of shallowly depressed metepisterna very dense but still much finer; metacoxae without denticle, deeply sulcate along posterior margin; 1. sternite regularly convex; apical angles of 2. – 4. prolonged into sharply acute subtriangular lobes; abdominal puncturation fine and sparse on median part of first two sternites, becoming denser and finer towards sides and much finer and sparser backwards, to hardly discernible on disk of anal segment; laterobasal dfp patches well developed; sides of anal sternite deeply sinuate, (becoming subparallel apically), apex very shallowly emarginate between short and inconspicuous lateral denticles. Metatibiae strongly curved outwards (pro- and mesotibiae, as usual in this group, markedly so inwards).

VARIABILITY

Paratype female is somewhat bigger (17 \times 6 mm.), has cupreous-bronzed (like in *H. borneanus* sp. n.) elytra, no distinct pulverulence (probably artifact of preservation), distinctly wider vertex (VW:HW \approx 0.2), less conspicuous transverse prebasal depressions on pronotum but slightly deeper median sulcus and pair of punctiform foveolae on both sides of it at midlength, deeper and more coarsely punctured elytral striae, narrower and deeply arcuately emarginated apex of anal sternite (its lateral margins straightly convergent throughout) – otherwise virtually identical to the holotype.

GEOGRAPHICAL DISTRIBUTION

Known only from the two specimens of the type-series – holotype collected in Central Luzon, paratype very imprecisely labelled: “Philippines”.

REMARKS

Deceptively similar to *H. viridula* (OL.), but markedly differing [(*italics in parentheses*): characters of *H. viridula* (OL.)] in details: pronotal structure [deep and basally broad (*lacking or but faintly indicated*) median sulcus, no trace of mid-discal and mediobasal foveolae (*one – sometimes poorly developed, exceptionally absent – pair at midlength on both sides of median line, and one at base on both sides of prescutellar pit*)], coarser frontal sculpture, concolorous (*almost always contrastingly violaceous*) epipleura, somewhat finer punctures in elytral striae, finer and sparser puncturation (*rather coarsely and not very sparsely punctured*) of disk of anal sternite, strongly (*not or but slightly*) curved male metatibiae, &c. Many of these characters are shared with *H. semperi* THY. which, however, can be easily distinguished by wider (V:H≈0.2) vertex in male, much stronger contrast between narrow anterior and broad posterior part of median sulcus on pronotum, less transverse scutellum, more convex and more conspicuously micropunctulate elytral intervals, &c. Better knowledge of the ranges of variability and distribution may reveal that both are geographical races (subspecies) of *H. viridula* (OL.), but for the moment such conclusion would be premature.

***Cardiaspis* SND.**

Cardiaspis SAUNDERS, 1867: 306-307.

Type species: *Cardiaspis mouhoti* SAUNDERS 1867: 307.

KEY TO SPECIES

- 1(4) Pronotal sides parallel or slightly divergent in basal third, disk with rather broad depression along midline
- 2(3) Head and at least part of elytra cupreous-red. Prosternal process bordered laterally with fine stria *babaulti* THY.
- 3(2) Uniformly green. Prosternal process bordered with broad sulcus *pisciformis* THY.
- 4(1) Sides of pronotum strongly convergent from base, median line not depressed *mouhoti* (SND.)

***Phrxiina* COB.**

Phrxiini COBOS 1975: 102-104.

KEY TO GENERA

- 1(2) Body flattened. Elytra contrastingly patterned longitudinally: suture and sides bluish-green, midlateral stripe purplish; no dfp spots *Paraphrxiia* SND.
- 2(1) Body cylindrical. Elytra basically unicoloured, often with tomented dfp spots
- 3(4) Antennae long, reaching to near or behind pronotal base, joints 6.-8. at least *ca.* twice longer than wide. Genae below eyes produced in form of careniform tubercles *Phrxiia* DEYR.

- 4(3) Antennae short, reaching only to *ca.* midlength of pronotum, 6.-8. joints not much longer than wide. Genae slightly carinate at lower end but not perceptibly produced *Exagistus* KERR.

***Phrixia* DEYR.**

Phrixia DEYROLLE 1864: 66-67.

Type species: *Phrixia filiformis* DEYROLLE 1864: 67.

KEY TO SUBGENERA

- 1(2) Apical margin of metacoxae strongly emarginated between median fifth and lateral margin *Phrixia* DEYR. s. str.
 2(1) Emargination of hind margin restricted to outer half of metacoxae *Stephansortia* THY.

***Phrixia* s. str.**

KEY TO SPECIES

- 1(16) Elytra with dfp spots
 2(13) Each elytron with at least 7 spots
 3(10) Dorsal side contrastingly multicoloured
 4(5) Sides of pronotum almost concolorous with disk. Each elytron with broad, prominent spots *matrismeeae* sp. n.
 5(4) Pronotal sides or midlateral longitudinal bands sharply contrasting with the rest of surface. Elytral spots small, less conspicuous
 6(7) Pronotum with pair of midlateral cupreous-red vittae contrasting with bluish-black middle and green sides *vittaticollis* WATH.
 7(6) Pronotal disk unicoloured violaceous or purplish, sides contrastingly green
 8(9) Vertex concolorous with front, dark bluish-green, slightly contrasting with dark violaceous pronotal disk. Elytra dark violaceous-blue *tricolor* sp. n.
 9(8) Vertex purplish-black like disk of pronotum, front contrastingly bright-green. Elytra blue *inopinata* sp. n.
 10(3) Dorsal side uniformly green
 11(12) Apical margin of epistome deeply emarginated. Front distinctly depressed along midline. Posthumeral spot on elytra present *luzonica* BMY.
 12(11) Emargination of apical margin of epistome shallow. Front almost flat. Elytra without posthumeral spot *albomaculata* FISH.
 13(2) Two or four spots on each elytron
 14(15) Dorsal side greenish-cupreous, elytra with row of four dfp foveolae along sides *fossulata* KERR.
 15(14) Dorsal side violaceous, elytra with two pubescent spots on sides of apical half *violacea* THY.

- 16(1) Elytra without dfp spots
 17(28) Elytra green or blue. Dorsal side glabrous
 18(25) Pronotum of similar colour to elytra
 19(20) Length of body >13 mm *opulenta* FISH.
 20(19) Body length <11 mm.
 21(22) Dorsal side greenish-golden *filiformis* DEYR.
 22(21) Dorsal side blackish-green or purplish-blue
 23(24) Dorsal side blackish-green *subtilis* sp. n.
 24(23) Dorsal side purplish-blue *gratiosa* OBB.
 25(18) Pronotum cupreous, elytra green
 26(27) Length of body below 11 mm *auricollis* (C.G.)
 27(26) Length of body above 13 mm *major* sp. n.
 28(17) Dorsal side uniformly cupreous-purplish. Body conspicuously pubescent
 *cuprina* KERR.

***Phrixia* (s. str.) *matrismearae* sp. n.**

MATERIAL EXAMINED

Holotype: "INDONESIA, Java, Djakarta, D.R.Johnson, 1953" "Collected at light"
 [♂ (RBH: BPj-x)]

CHARACTERS

Holotype: Male 12.0×3.6 mm. Head blackish; pronotum blackish-green; elytra dark purplish-bronzed, each with 10 very conspicuous (besides some minute here and there) white-pubescent and pulverulent dfp spots arranged in three longitudinal rows: median (consisting of 5 equidistant, progressively smaller between very broad suprahumeral and small, somewhat elongated *ca.* 1 mm. before apex) along – but definitely wider than – 4 intrestria, lateral (3 smaller: one somewhat behind second median, one at the level of third median, and one a little anterad of fourth median) on 8., and marginal (one elongated just behind humerus and one making in fact the outer part of third lateral: separated from it only by – here narrowly carinuliform – 9. interstria), also individual punctures white from pulverulence; ventral side blackish-green (sternum medially) to greenish-black (abdomen). with white-pubescent and pulverulent dfp patches on pro- and metepisterna, metacoxae, and sides of anterior halves of sternites. Dorsal side (except dfp spots) practically glabrous (but punctures pulverulent), ventral with not very dense, recumbent, rather long on prosternum but much shorter otherwise, white pubescence.

Head regularly convex in lateral aspect, anterior part of front broadly and rather deeply depressed, separated by indistinct ^-shaped carinula from deeply subtriangularly emarginated epistome. Front trapezoidal (UW:LW:L≈1.0:1.2:1), lateral margins straight; vertex wide (VW:HW≈0.5), very finely, inconspicuously longitudinally furrowed along midline. Frontal punctures moderately coarse, rather dense, slightly elongate, gradually transgressing into somewhat finer and much sparser on vertex. Antennae long (reaching basal third of pronotal sides), slender; 1. joint club-shaped, *ca.* 3× longer than thick; 2.

much slenderer, L:W \approx 1.5; 3. somewhat flattened, apically as wide as, but more than twice longer than, 2. and *ca.* 3.5 \times longer than wide; 4.-10. elongately subrhomboidal, equally wide but progressively shorter (10. *ca.* twice longer than wide); 11. again somewhat longer, very elongately ovate.

Pronotum transversely trapezoidal (BW:AW:L \approx 1.4:1.3:1), sides subparallel in basal third then slightly convergent, basal angles very slightly acute, basal margin distinctly bisinuate with subtriangular prescutellar lobe, apical angles slightly obtuse, anterior margin almost straight. Disk regularly convex except shallow transverse depression separating prescutellar lobe; punctures moderately coarse, evenly (at distances subequal to their diameters) spaced at middle, conspicuously denser on sides, almost confluent at anterior angles; prescutellar pit triangular, deep, sharply defined; lateral carina short, not reaching pronotal midlength. Scutellum semicircular, very finely punctulate.

Elytra (L:W \approx 2.5) definitely "caudate", apices semicircularly emarginate between almost spiniform lateroapical denticle and not much less acute but distinctly less protruding sutural angle), lateral margins smooth throughout; no trace of subhumeral denticle; epipleura narrow, reaching to apices. Striae almost regular (except some confusion on sides), coarsely punctured, inner 5-6 deepened, outer in form of very dense puncture-rows; two lateralmost (9.-10) confluent into one in basal third; interstriae subequally convex, finely and very sparsely punctulated in median parts, more densely so on sides; each elytron with round depression at base between scutellum and suprahumeral spot.

Prosternum shallowly but distinctly, transversely depressed behind almost straight anterior margin; sternal punctures very fine and sparse medially, much coarser and very (subconfluently) dense on sides, still coarser but again sensibly sparser on proepisterna, moderately sparse on sides of metasternum, fine and rather dense on abdomen; prosternal process without lateral stria or rim; mesosternum not quite divided; metasternum medially flat; metacoxae without dent; 1. abdominal segment regularly convex; 2. - 4. with apical angles prolonged into sharply acute lobes; apex of anal sternite triangularly incised between narrowly rounded lateral lobes. Aedoeagus testaceous, parameres subparallelsided, shortly rounded lateroapically; apex of penis spiniform. Meso- and metafemoral brushes not very prominent but in proximal part distinct.

GEOGRAPHICAL DISTRIBUTION

Java; known only from the holotype.

REMARKS

Blackish-green colouration with contrastingly bronzed-purplish elytra, and especially very conspicuous large elytral dfp markings, make this species unmistakable. BELLAMY (1991, 2003) recognizes 10 species in this genus, only one of them (totally dissimilar *P. gratiosa* OBB.) occurring on Java. No species from the continental Asia or Malay Archipelago shows pattern of elytral dfp spots similar to *P. matrismiae* sp. n. (in *P. violacea* THY. from "Malésie ?" there are only "deux impréssions à fond verdâtre et légèrement pubescents" in lateroapical part (THÉRY 1926), in Siamese *P. fossulata* KERR. "de chaque côté, quatre taches arrondies, vert clair et mat" (KERREMANS 1909),

others – Bornean *P. cuprina* KERR. and *P. opulenta* FISH., Javanese *P. gratiosa* (OBB.), Moluccan *P. filiformis* DEYR., and *P. auricollis* (C.G.) described from “*Indes orientales*” – have elytra without any pubescent markers; in Philippinean representatives of the genus (*P. albomaculata* FISH., *P. luzonica* BMY. and especially *P. vittaticollis* WATH.) the pattern is similar, but spots are much smaller and less conspicuous; moreover, the new species can be easily distinguished from all those previously described in radically different colouration and other details. Its closest relative seems to be *P. vittaticollis* WATH.

***Phrixia* (s. str.) *tricolor* sp. n.**

MATERIAL EXAMINED

Holotype: “1978” [blue label] “Coll. D^f A.Frh.v.Hoscheck † Philippinen, *Mindanao*, *Kolambugan* †” “leg. Böttcher, I. 1915.” [reverse of label] “*Phrixia vittaticollis* Wat., *Det. Hoscheck 1930*” [ø (KBIN)].

CHARACTERS

Holotype: Sex unknown, 8.7×2.5 mm. Head, broad bands along pronotal sides, and ventral side bright green; disk of pronotum dark purplish; elytra dark violaceous transgressing apicalwards into purplish, each with 6 conspicuous and 2 hardly discernible punctiform white-pubescent and pulverulent dfp spots: inner row of four on 4. interstria, outer two on 8. slightly anterad of – respectively – 2. and 3. inner, supplemented with very small and indistinct preapical on 6. interval and still less apparent humeral; white-pubescent and pulverulent dfp patches also on metacoxae and at anterolateral angles of sternites. Otherwise pubescence of both dorsal and ventral side hardly discernible (somewhat more apparent on elytra).

Head regularly convex in lateral aspect; front slightly trapezoidal (UW:LW: L≈1.3:1.4:1), lateral margins straight, vertex wide (VW:HW≈0.65); frontal depression broad and rather deep, epistome not separated, deeply semicircularly emarginated. Frontal punctures moderately coarse, rather dense, on vertex somewhat finer and sparser. 1. antennomere club-shaped, *ca.* 4× longer than thick; 2. much thinner, L:W≈1.5, more distal joints missing.

Pronotum transversely rectangular, BW:AW:L≈1.4:1.4:1), sides subparallel, indistinctly arcuately expanded at basal third, basal angles slightly acute, basal margin distinctly bisinuate with rounded prescutellar lobe, apical angles right, anterior margin straight. Disk regularly convex except shallow transverse depression along anterior margin and punctiform prescutellar pit; punctures fine and sparse at middle of disk, coarser and denser but still clearly separated on sides; lateral carina short, not extending beyond basal third. Scutellum semicircular, smooth.

Elytra (L:W≈2.6) slightly “caudate”, apices obliquely truncate between lateroapical and less acute but distinctly more protruding sutural denticle, lateral margins smooth throughout; no trace of subhumeral denticle; epipleura very narrow but entire. Puncture rows (except apical parts of inner two) not depressed, rather regular on basal half but almost totally confused towards apices; punctures in rows rather coarse, those on flat interstriae not much finer.

Prosternum shallowly transversely depressed behind almost straight anterior margin; sternal punctures very fine and sparse medially, somewhat coarser and very (subconfluently) dense on sides, still coarser but again much sparser on proepisterna, sides of metasternum, and abdomen. Prosternal process without lateral stria or rim; metacoxae without dent; 1. sternite regularly convex; 4.-5. abdominal segments missing. No distinct meso- or metafemoral brushes.

GEOGRAPHICAL DISTRIBUTION

Philippines: Mindanao; known only from the holotype.

REMARKS

Contrastingly tricoloured body in combination with small size and elytral spots makes *P. tricolor* sp. n. easily recognizable. Apparently most closely related to *P. vittaticollis* WATH. (and so determined by HOSCHECK) which, however, is much larger (12.5 mm. according to the original description – WATERHOUSE 1887), shows different pattern of colouration (pronotum bluish with pair of cupreous-red vittae, scutellum green, &c.), elytral spots more numerous, coarser and denser puncturation.

Phrixia (s. str.) *inopinata* sp. n.

MATERIAL EXAMINED

Holotype: “Maco, Tagum, Davao Province, MINDANAO, sea level; X:-:46” “CNHM-Philippine Zool. Exped. (1946-47), H. Hoogstral & D. Heyneman leg.” “dipterocarp forest” “*Phrixia albomaculata* Fisher, DET. CLBELLAMY 1991” “Ex. Coll. C.L.Bellamy (CLBC)” [purplish label] [♂ (CSCA)].

DESCRIPTION

Holotype: Male, 10.5×3.2 mm.: front, pronotal sides of pronotum, sternum and basal segment of abdomen bright green (2. – 5. sternites duller, becoming greenish-brown towards apex); scutellum and elytra more bluish; vertex and median half of pronotum contrastingly purplish. Each elytron with 6 conspicuous and 2 hardly discernible punctiform white-pubescent and pulverulent dfp spots: inner row of four on 4. interstria, outer two on 8. slightly anterad of – respectively – 2. and 3. inner, supplemented with less apparent humeral and very small and indistinct preapical somewhat anterolaterally of 4. inner; white-pubescent and pulverulent dfp patches also on metacoxae and at anterolateral angles of sternites. Otherwise pubescence of head and pronotum hardly discernible, that of elytra and ventral side slightly more apparent; no distinct meso- or metafemoral brushes.

Head regularly convex in lateral aspect; front almost parallelsided (UW:LW: L≈1.3:1.4:1), lateral margins straight, vertex wide (VW:HW≈0.6); frontal depression broad and very shallow, epistome not separated, deeply arcuately emarginated. Puncturation of front very dense and longitudinally confluent, on vertex somewhat sparser. 1. antennomere club-shaped, ca. 3× longer than thick; 2. much thinner, L:W≈1.5, more distal joints missing.

Pronotum transversely rectangular, BW:AW:L \approx 1.3:1.3:1), sides subparallel, indistinctly arcuately expanded at basal third, basal angles sharply acute, basal margin distinctly bisinuate with rounded prescutellar lobe, apical angles right, anterior margin straight. Disk regularly convex except shallow transverse depression along anterior margin and punctiform prescutellar pit; punctures fine and sparse at middle of disk, coarser and denser but still clearly separated on sides; lateral carina not discernible except just at basal angles. Scutellum trapezoidal, smooth.

Elytra (L:W \approx 2.6) slightly "caudate", apices obliquely truncate between lateroapical and less acute but somewhat more protruding sutural denticle, lateral margins smooth throughout; no trace of subhumeral denticle; epipleura very narrow but entire. Puncture rows (except apical parts of inner two) not depressed, rather regular at middle but almost totally confused around humeri and in lateroapical part; punctures in rows rather coarse, those on flat interstriae not much finer, sparse on disk, denser on sides.

Prosternum shallowly transversely depressed behind almost straight anterior margin; prosternal process sparsely and very finely punctulate, without lateral stria or rim; otherwise punctures on ventral side (especially proepisterna and anal sternite) coarser and denser. Metacoxae without dent; metasternum and 1. sternite regularly convex; apical margin of first sternite emarginated midlaterally on each side, the emargination meets straight lateral part at definite though obtuse angle; lateral angular projections of sternites small and inconspicuous; apex of anal sternite shallowly emarginate between rounded lateral angles. Aedoeagus testaceous, becoming darker towards sides and apices of parameres; subparallelsided in basal, strongly arcuately widened in apical half, widest at apical fourth; penis narrow, parallelsided, with bluntly angular tip.

GEOGRAPHICAL DISTRIBUTION

Philippines: SE-Mindanao, known only from the holotype.

REMARKS

In most features agrees with the original description (FISHER 1922) of, and BELLAMY'S (1991) remarks on, *P. albomaculata* FISH., but strikingly differs in colouration, resembling in this respect *P. tricolor* sp. n.; the latter, however, is smaller, darker, has vertex concolorous with front, sculpture of the body much finer, &c. Epistome rather deeply, angularly emarginate, (resembling that in *P. luzonica* BMY. rather than – judging from the drawing in BELLAMY 1991 – *P. albomaculata* s. str.). Midlateral, angularly delimited sinuation of apical margin of first sternite is apparently an unique feature: it has not been mentioned by either FISHER (1922) or BELLAMY (1991), and is not seen in any other species known to me. Aedoeagus similar [judging from BELLAMY'S (1991) drawing] to that of *P. albomaculata* FISH. but dorsal slit narrower; parameres widest more apically, penis narrower, its tip without denticular prolongation.

Phrixia (s. str.) *subtilis* sp. n.

MATERIAL EXAMINED

Holotype: "NEW GUINEA: NE, Angoram, 10 m., 14. VIII. 1969" "J.L.Gressitt, Collector, BISHOP MUSEUM" [ø (BPBM)].

DESCRIPTION

Holotype: Sex unknown, 9.1×2.5 mm. Almost uniformly (incl. antennae and tarsi) dark green with bronzed-purplish reflexions on head, middle of pronotum, posterolateral parts of elytra, dorsal edges of femora and around apical angles of metasternum and three (especially bright on 1.) basal sternites. Both dorsal and ventral side practically glabrous, only anterior margin of prosternum adorned with dense brush of pale-brown setae; rather dense and long, transversely arranged, recumbent pubescence of the same colour covers antero-midlateral (but not median or proepisterna) parts of prosternum; and some inconspicuous, very short, sparse, recumbent pale hairs are discernible on sides of abdomen.

Epistome narrowly but deeply semicircularly emarginated at middle, not separated from front; cheeks carinately produced below eyes. Front transversely trapezoidal, broadly and rather deeply depressed in anterior part, densely covered with moderately coarse, longitudinally confluent puncturation; on vertex punctures become distinctly sparser and separate. V:W≈0.6. Supraantennal ridges inconspicuous, short. Antennae slender, reaching to *ca.* basal third of pronotal sides; 1. joint >3× longer than wide; 2. almost as thick but globular; 3. as long as but much thinner than 1., subcylindrical; 4. triangular, by half shorter; 5.-10. progressively shorter (10. barely longer than wide) and more rhomboidal; 11. ovate, *ca.* as long as 6.

Pronotum rectangular, slightly transverse (BW:AW:L≈1.15:1.05:1); basal and apical margins distinctly bisinuate with broadly rounded median lobes, basal angles slightly acute, apical right; sides subparallel, almost imperceptibly bisinuate; lateral carina very short, discernible only just before basal angles. Disk regularly convex (deep fovea at basal third to the right of midline is evidently accidental) except for very shallow transverse prebasal depression and punctiform prescutellar pit; puncturation fine and very sparse along middle, gradually transgressing into dense and moderately coarse on sides. Scutellum very small, convex, smooth.

Elytra (L:W≈2.7) subparallelsided (sides almost imperceptibly sinuate) to mid-length, then narrowly cuneately tapering to sharply bidenticulate apices; epipleura very narrow and inconspicuous but reaching to near apices; no trace of epipleural denticle. Humeral protuberances distinct, transverse basal sulcus narrow but deep, otherwise (except for large, obviously artificial depression at suture in basal third of left elytron) surface regularly convex. Discal five striae consist of rows of very fine punctures, laterals almost totally confused, discal interstriae with but very sparse minute punctulation.

Anterior margin of prosternum straight; Prosternal process bordered with deep striae, punctures of sternum very fine and (especially on prosternal process) sparse medially, coarser but not denser on proepisterna. Metasternum medially sulcate, disk with rather dense, sides with sparser, moderately fine puncturation; metepisterna rather deeply longitudinally depressed; metacoxae without denticle. 1. sternite regularly convex, punctures rather sparse and moderately coarse; other segments very finely punctulate; apex of anal sternite rather shallowly semicircularly emarginated between pair of minute but sharp lateral denticles, the emargination almost totally filled with straightly truncated apical lamina.

GEOGRAPHICAL DISTRIBUTION

New Guinea: Angoram [4°03'S-144°04'E, on the northern – left – side of Sepik river; at least this is the only locality of this name I have been able to find]; known only from the holotype.

REMARKS

Of the species available to me for examination (*P. matrismeeae* sp. n., *P. tricolor* sp. n., *P. inopinata* sp. n., *P. luzonica* BMY., *P. major* sp. n.) none shows prosternal process striatomarginate; according to THÉRY (1926) *P. violacea* THY. from “Malaisie?” has bordering stria, but two tomented spots on each elytron and “faible pubescence argentée” on anal sternite preclude its identity to the new species; descriptions of other taxa do not mention this character at all, but anyway pronotum “fortement rugueux par suite de rides transversales qui le couvrent entièrement” [DEYROLLE 1864] suffices to exclude *P. filiformis* DEYR.; in *P. fossulata* KERR. front and vertex is medially grooved and side of each elytron with four foveolae; numerous pubescent spots on elytra characterize also Philippinean *P. vittaticollis* WATH. and *P. albomaculata* FISH.; *P. cuprina* KERR. and *P. opulenta* FISH. are larger (11-14 mm.) and pronotum is also transversely rugose; while (according to rather poor original descriptions) both *P. auricollis* (C.G.) from “Indes orientales” and Javanese *P. gratiosa* OBB. medial line of pronotum is sulcate; each of them differs also in other details (proportions, colouration, pubescence, shape of pronotum). As, at that, *P. subtilis* sp. n. is the only species of *Phrixia* DEYR. inhabiting New Guinea – with the sole exception of Ceramese *P. filiformis* DEYR. none of its congeners has ever been reported to occur E of WALLACE’S Line – there can be no reasonable doubt that it represents a hitherto undescribed taxon.

Phrixia (s. str.) *major* sp. n.

MATERIAL EXAMINED

Holotype: “PHILIPPINES, Babuyan Islands, Camiguin Island, May 2001, Local collector” “Ex. Coll. C.L.Bellamy (CLBC)” [purplish label] [♂ (CSCA)]; **Paratypes:** “*Phrixia vittaticollis?*, Babuyan Is., N.Luzon, Philippines. May 2003” [1 ♀ (RBH: BPj-w)]; “*Philippines, Calayan Isl., N. Luzon, aug. 2002*” “*Phrixia auricollis* (G.+L.), Sv.Bílý det. 03” “*Ph. auricollis* (L.+G)” “Coll. de Sainval” [1♂ (TNS)].

DESCRIPTION

Holotype: Male 13.9×3.8 mm. Dorsal side bright green with epistome bright purplish-red, sides and lower part of front with strong purplish-red shine, also elytral margins (sutural and lateral extremely narrow, basal and apical somewhat wider) purplish-red, pronotum transgressing laterobasalwards into cupreous; ventral side with golden shine; no dfp spots. Sternum and 1. sternite with rather long, erect, soft pilosity along midline, otherwise pubescence of both dorsal and ventral side inconspicuous, very short, white; no distinct meso- or metafemoral brushes.

Front trapezoidal (UW:LW:L≈1.1:1.3:1), lateral margins shallowly sinuate, vertex wide (VW:HW≈0.5); frontal depression broad and moderately deep, epistome deeply

(at *ca.* right angle) triangularly emarginated, separated from front by distinct ^-shaped furrow. Frontal punctures moderately coarse, very dense and confluent, on vertex finer and sparser. 1. antennomere club-shaped, *ca.* 3× longer than thick; 2. much thinner, L:W<1.5; 3. still thinner, as long as 1., 4.–10. somewhat wider, elongately rhomboidal, progressively shorter (10. *ca.* twice longer than wide); 11. fusiform, longer than 10.

Pronotum slightly transverse, BW:AW:L≈1.2:1.1:1), sides definitely sinuately divergent in basal third, straightly convergent in apical ⅓, both parts meeting at obtuse but well defined angle; basal margin distinctly bisinuate with rounded prescutellar lobe, basal angles indistinctly acute, anterior margin straight. Disk regularly convex except punctiform prescutellar pit; punctures moderately coarse, rather sparse at middle, denser and subconfluent on sides; lateral carina short. Scutellum small, trapezoidal.

Elytra (L:W≈2.7) very slightly “caudate”, apices obliquely truncate between lateroapical and less acute but distinctly more protruding sutural denticle, lateral margins smooth throughout; no trace of subhumeral denticle; epipleura very narrow but entire. Puncture rows not depressed, inner three regular, outer almost totally confused; perisutural interstriae impunctate and lustrous, lateral densely punctured and more distinctly microsculptured.

Prosternum shallowly transversely depressed behind almost straight anterior margin; prosternal punctures very fine and sparse medially, somewhat coarser and dense on sides and proepisterna; sides of metasternum with rather dense and moderately coarse, abdomen with finer punctures. Prosternal process without lateral stria or rim; metacoxae without dent; 1. sternite regularly convex; apex of anal sternite truncated, lateroapical denticles imperceptible. Aedoeagus yellow, sides of parameres at apical third dark brown; parameres parallelsided to apical third, then paraboloidally narrowed to apices; penis rounded at tip.

VARIABILITY

Male paratype slightly slenderer (14.2×3.7 mm.), with cupreous-red pronotum, pronotal sculpture coarser and irregular (apparent malformation at hatching), also elytra with irregular asymmetrical depressions. Female paratype larger (14.4×4.3 mm.) and more robustly built; head uniformly green; pubescence short and inconspicuous throughout, frontal puncturation less dense, vertex somewhat wider (VW:HW≈0.55), punctulation of each proepisternon divided by smooth and lustrous, rather broad, longitudinal stripe; otherwise practically identical to the holotype.

GEOGRAPHICAL DISTRIBUTION

Philippines: Babuyan Is. off N-Luzon.

REMARKS

Easily distinguishable by size and colouration, its apparently closest relatives being either much smaller (9 mm.) *P. auricollis* (C.G.) from India (?) or differently coloured (pronotum and elytra [violaceous-]blue) *P. opulenta* FISH. from Sarawak.

Phrixia sg. *Stephansortia* THY.*Stephansortia* THÉRY 1925: 124-125.**Type species:** *Stephansortia cyanipennis* THÉRY 1925: 125-126.

KEY TO SPECIES

- 1(2) Pronotum long, almost quadrate (BW:AW:L \approx 1.15:1.1:1). Body slender (L:W \approx 3.3)
 *archboldi* sp. n.
- 2(1) Pronotum proportionally wider, sides strongly convergent in apical half (BW:AW:
 L \approx 1.4:1.1:1). Body more robust (L:W \approx 3.0)
- 3(4) Elytra blackish-olive. Antennae very slender (3.–4. joints 3.5 – 4 \times longer than
 wide) *torreana* (LEV.)
- 4(3) Elytra violaceous. Antennae more robust: 3.–4. antennomeres 2.5-3 \times longer than
 wide *cyanipennis* (THY.)

Phrixia (Stephansortia) archboldi sp. n.

MATERIAL EXAMINED

Holotype: “Sturt Island, Fly River, Papua, Oct. 19 1936, Archbold Exped.” “Ex. Coll. C.L.Bellamy (CLBC)” [purplish label] [σ^{\wedge} (CSCA)].

DESCRIPTION

Holotype: Male 11.0 \times 3.3 mm. Colouration dull, greenish-black with purplish shine on head and pronotum, more definitely purplish on elytra and sternum, dark green on abdomen; no dfp spots. Dorsal side practically glabrous, ventral covered with short, recumbent, almost uniformly distributed white pubescence; no distinct meso- or metafemoral brushes.

Front trapezoidal (UW:LW:L \approx 1.1:1.2:1), lateral margins straight, vertex wide (VW:HW \approx 0.55); frontal depression broad and moderately deep, epistome deeply (at almost right angle) triangularly emarginated, not separated from front. Frontal punctures coarse, dense but not confluent, on vertex slightly sparser. 1. antennomere club-shaped, *ca.* 3.5 \times longer than thick; 2. much slenderer, L:W $<$ 1.5; 3. still thinner, twice longer than 2., 4 \times longer than thick; 4.–10. of similar width, elongately rhomboidal, progressively shorter (10. still *ca.* 2.5 \times longer than wide); 11. fusiform, barely longer than 10.

Pronotum almost as long as wide, BW:AW:L \approx 1.15:1.1:1), sides subparallel, very shallowly S-shaped; base shallowly bisinuate; basal angles indistinctly acute, apical obtuse; anterior margin straight. Disk regularly convex except deep, elongate (prolonged as shallower sulcus to basal 2/5) prescutellar and pair of distinct punctiform laterobasal pits; punctures coarse, moderately dense, somewhat finer but denser anterolaterally; microsculpture distinct but rather weak; lateral carina practically absent (represented by smooth, slightly convex strip). Scutellum small, semicircular.

Elytra (L:W \approx 2.3) subparallelsided to midlength, almost imperceptibly caudate; apices obliquely truncate between acute, equally protruding lateroapical and sutural denticle, lateral margins smooth throughout; no trace of subhumeral denticle; epipleura very narrow but entire. Puncture rows not depressed, inner three regular, outer somewhat confused; punctures in discal striae rather fine, much coarser towards sides; interstriae lustrous, almost impunctate.

Anterior margin of prosternum almost straight; prosternal process slightly convex, without lateral stria or rim; sparsely and rather finely punctulate; punctures on sides and proepisterna coarse and dense; metasternum and abdomen with fine and moderately dense punctulation at middle, sides with much coarser but also not very dense punctures, those of 2. sternite leaving broad but indefinite almost smooth triangular space at lateroapical angle; apical margin of metacoxae rather deeply sinuate in outer half, very shallowly arcuate medially, both parts meeting at very obtuse and almost obliterated angle; 1. sternite regularly convex; lateroapical lobes of sternites prominent; apex of anal segment truncated, lateroapical denticles barely perceptible. Aedoeagus yellowish-testaceous in basal part, becoming dark-brownish towards apex, parameres almost parallelsided in basal and very slightly roundedly expanded in apical third, then paraboloidally narrowed to apices; lateroapical margins of penis distinctly sinuate before tip, making its apex sharply, subspinously acute.

GEOGRAPHICAL DISTRIBUTION

Southern New Guinea, known only from the holotype.

REMARKS

Clearly shows the main characteristics of *Stephansortia* THY. but does not agree with the descriptions (THÉRY 1925, LEVEY 1992) and photographs of the types of any of its two hitherto known species, so – despite of discrepancies (colouration, pronotal pits) between these descriptions and photographs – it seems evident that the specimen before me represents a new species.

Exagistus DEYR.

Exagistus DEYROLLE 1864: 65.

Type species: *Exagistus igniceps* DEYROLLE 1864: 65-66.

KEY TO SPECIES

- 1(2) Sides of abdomen covered with dense yellow pubescence *atroviridis* FISH.
- 2(1) Abdominal pubescence sparse
- 3(6) Disk of pronotum rather sparsely punctured, spaces between punctures subequal to their diameter or wider
- 4(5) Length of body less than 12 mm. Dorsal side blackish. Front with prominent median carina *bellamyi* sp. n.

- 5(4) Length of body more than 13 mm. Body above and below rather light bronzed. Frontal carina reduced, inconspicuous *malayanus* sp. n.
- 6(3) Pronotal disk densely punctured, punctures separated with spaces much narrower than their diameter
- 7(14) Sutural denticle of elytral apex prominent, protruding farther backwards than lateral. Elytra subequally, inconspicuously pubescent
- 8(11) Pronotum broadly and deeply depressed along median line, the depression widest and deepest towards base
- 9(10) Almost uniformly bronzed-brown, sides of pronotum and elytra at most inconspicuously more reddish than disks, ventral side also dark, only front definitely brighter cupreous-red. Prosternal process (especially in males) narrow and strongly convex, more coarsely punctured *brunneus* FISH.
- 10(9) Front contrastingly, sides of pronotum and lateroapical parts of elytra also distinctly more reddish than rest of dorsal surface, ventral side light-bronzed. Prosternal process wider and flatter, its puncturation usually finer
..... *strandii* OBB.
- 11(8) Pronotal disk regularly convex or median depression shallow, indistinct, marked only in anterior half
- 12 (13) Front below less densely punctured (ca. 17 punctures across), punctures clearly separated *rossi* OBB.
- 13 (12) Lower part of front very densely (ca. 20 punctures across), almost confluent punctulate *igniceps* DEYR.
- 14(7) Sutural angle of elytral apex without distinct denticle, lateral protruding much farther. Apical 1/7-1/8 of elytra covered with contrastingly longer and denser pubescence than rest of surface *apicepubens* sp. n.

***Exagistus malayanus* sp. n.**

MATERIAL EXAMINED

Holotype: "Penang" [♂? (RBH: BPKdd)]

CHARACTERS

Holotype: Male?, 14.5×4.5 mm. Head bronzed-brown with greenish reflexions on front; pronotum dark-brown at middle, transgressing into bronzed on sides and greenish at anterior angles; elytra bronzed, somewhat darker at base and more golden at tips; ventral side golden-aeneous with green median parts of sternum; legs dull bluish-green. Pubescence of both dorsal and ventral side distinct, yellowish, short, moderately dense, erect on prosternal process, recumbent otherwise.

Front transverse (UW:LW:L≈1.2:1.3:1), parallelsided; vertex wide (VW:HW≈0.6); epistome deeply and widely triangularly emarginated, separated from front by deep arcuate groove; front flat with shallow indefinite depression just behind epistome; frontal sculpture consists of rather coarse and very dense elongated and rugosely confluent puncturation with inconspicuous smooth relief along midline of upper part; eyes

slightly protruding. Antennae slender, reaching to *ca.* midlength of pronotal sides; 1. joint club-shaped, *ca.* 3× longer than thick; 2. distinctly thinner, globular; 3. still thinner, twice longer than 2., 4. elongately triangular, as long as 2. and 3. together; 5.-10. progressively shorter (10. *ca.* twice shorter than 5) and more rhomboidal; 11. slightly longer than 10., somewhat asymmetrically ovate.

Pronotum transverse, BW:MW:AW:L≈1.4:1.5:1.2:1), sides definitely sinuately divergent in basal fifth, there angularly meeting anterior, straightly convergent part; basal margin distinctly bisinuate with rounded prescutellar lobe, basal angles right, anterior margin shallowly sinuate with median lobe protruding further than obtuse apical angles; no trace of “collar”. Disk regularly convex except punctiform prescutellar pit; punctures moderately coarse, rather densely and almost evenly (but slightly sparser on disk) spaced, with inconspicuous smooth relief along basal half of midline; lateral carina (viewed from side) strongly S-shaped, reaching to midlength. Scutellum small, pentagonal, flat and smooth.

Elytra (L:W≈2.4); sides somewhat sinuately subparallel to near midlength, then cuneately tapering to apices; lateral margins smooth throughout; no trace of subhumeral denticle; apices obliquely emarginate between lateral and more protruding sutural (both sharply acute) denticles; epipleura practically non-existent behind metacoxae. Striae fine but continuously depressed, finely (inner four) to moderately punctulate; punctulation of interstriae very fine and sparse on disk, somewhat coarser and denser laterally; laterobasal depression rather deep, posthumeral (extending from humeral protuberance to midlength and from lateral margin to 4. stria) conspicuous but shallow and indefinite, otherwise elytra regularly convex.

Anterior margin of prosternum almost straight and somewhat swollen; prosternal process rather coarsely but sparsely punctured between deep lateral striae; puncturation of lateral parts (including proepisterna) somewhat coarser and denser; that of metasternum still more so; abdomen almost evenly, rather finely and densely punctulate. Metacoxae without dent; 1. sternite regularly convex; apex of anal sternite rather deeply arcuately emarginate between somewhat acute lateral angles, emargination filled with apically truncated lamella; 1. joint of metatarsi rather stout, as long as 2. and 3. together.

GEOGRAPHICAL DISTRIBUTION

Malaya: Penang; known only from the holotype.

REMARKS

Larger than any other hitherto described congener; in almost uniform colouration resembling Bornean *P. brunneus* FISH. (which, however, has epistome not separated from front, pronotal disk with a broad median depression, &c.), and especially (also geographically closest – Malay Peninsula: Kedah – but unfortunately not known to me in nature) *P. atroviridis* FISH., differing in “*Halsschild etwa zweimal so breit as lang, ... mit fast parallelen Seiten ... flach, in der Mitte mit einer ... Mediandepression*”, “*Seiten des Abdomens mit einer dichten gelben Behaarung dicht bedeckt*” – OBERBERGER 1936.

Exagistus bellamyi sp. n.

MATERIAL EXAMINED

Holotype: "MALAYSIA: Sabah, Crocker Range, Mt. Trus Madi 1000m, N05°33'00" E116°31'00", 28.iii.2003 local collector" "Ex. Coll. C.L.Bellamy (CLBC)" [♀ (CSCA)].

DESCRIPTION

Holotype: Female, 11×3 mm. Head purplish-brown transgressing into cupreous-red anteriorly and bronzed-brown on vertex; pronotum blackish-brown with purplish shine on sides, elytra almost black with plumbeous-green reflexions; ventral side and legs cupreous-bronzed; antennae dark bluish-black. Pubescence very short, semierect, whitish on front and towards elytral apices, similar but slightly more conspicuous on ventral side, practically missing on pronotum and basal half of elytra.

Front decidedly transverse, almost parallelsided (UW:LW:L≈1.6:1.65:1); vertex wide (VW:HW≈0.6); epistome deeply regularly arcuately emarginated between sharply right-angled lateral angles, separated from front only by very shallow and indistinct depression; front flat; sculpture consists of rather coarse, somewhat elongated puncturation on upper part and very fine, dense, inconspicuous among strong microsculpture, above epistome; median line with smooth, somewhat irregular but distinct carina on upper 2/3. Antennae slender, reaching to beyond midlength of pronotal sides; 1. joint club-shaped, *ca.* 3× longer than thick; 2. distinctly thinner, ovate; 3. still thinner, as long as 1., 4. elongately triangular, as long as 2. and 3. together; 5.-10. progressively shorter (10. *ca.* twice shorter than 4) and more rhomboidal; 11. slightly longer than 10., fusiform.

Pronotum transverse, BW:MW:AW:L≈1.3:1.35:1.15:1), subglobular, widest (but not angular) at basal fourth, arcuately convergent anterad; basal margin very deeply bisinuate with narrowly truncated prescutellar lobe, basal angles right, anterior margin almost regularly arcuate with median lobe protruding much further than obtuse apical angles; no trace of "collar". Disk regularly convex except elongately punctiform prescutellar pit and shallow indication of median sulcus in anterior half; punctures moderately coarse and rather sparse at middle but distinctly finer and very dense towards sides, with inconspicuous smooth relief along basal half of midline; lateral carina (viewed from side) strongly S-shaped, almost entire. Scutellum small, pentagonal, flat and smooth.

Elytra (L:W≈2.5): sides somewhat sinuately subparallel in basal third, then slightly divergent to maximum width at midlength, arcuately rounded to near apices and slightly sinuate ("caudate") in apical tenth; lateral margins smooth throughout; no trace of subhumeral denticle; apices deeply obliquely emarginate between lateral and more protruding sutural (both sharply acute) denticles; epipleura practically non-existent behind metacoxae. Striae continuous, sharply defined, rather finely punctulate on disk and coarsely on sides; punctulation of inner interstriae somewhat finer, sparse and irregularly uniserial, denser (but not coarser) and less regular laterally; laterobasal depression rather deep, perisutural (including inner 2 interstriae) abruptly appearing at basal fourth and gradually vanishing to *ca.* midlength, otherwise elytra regularly convex.

Anterior margin of prosternum almost straight and somewhat swollen; prosternal process flat, moderately wide, parallelsided to posterior margin of procoxae, somewhat elongately (at definitely acute angle) triangular behind; puncturation sparse, rather fine; no trace of lateral striae; proepisterna finely and densely punctulate anteriorly, definitely coarser and somewhat sparser towards base; median sulcus of metasternum entire but narrow in posterior half; sculpture of metasternal disk consists of moderately sparse and fine, simple punctures, lateral parts covered with transverse anastomosing strigulation; metepisterna not depressed; metacoxae without denticle. 1. sternite regularly convex, sparsely and rather coarsely punctured medially, punctulation becomes much finer and denser towards sides and apex of abdomen; apex of anal sternite rather deeply trapezoidally emarginate between rather long acute lateral denticles, emargination filled with apically truncated lamella. 1. joint of metatarsi rather stout, as long as 2. and 3. together.

GEOGRAPHICAL DISTRIBUTION

Borneo: Sabah; known only from the holotype.

REMARKS

Differs from all the remaining species in almost black dorsal colouration and conspicuous median carina of front. Resembles *P. malayanus* sp. n. in lustrous, sparsely punctured elytral disk, but in that species lateral striae are also finely punctured, epistome is sharply separated from front, median line of pronotum not depressed, lateroapical margins of elytra arcuate throughout (with no trace of preapical sinuation), prosternal process laterally striatomarginate, proepisterna coarsely punctured, legs and parts of sternum green.

Exagistus apicepubens sp. n.

MATERIAL EXAMINED

Holotype: "MALAYSIA: Sabah, Crocker Range, Mt. Trus Madi 1000m, N05°33'00" E116°31'00", 27.iii.2003 local collector" "Ex. Coll. C.L.Bellamy (CLBC)" [♂ (CSCA)]; **Paratypes:** "MALAYSIA: Sabah, Crocker Range, Mt. Trus Madi 1000m, N05°33'00" E116°31'00", 18.iv.2003 local collector" "Ex. Coll. C.L.Bellamy (CLBC)" [1 ♀ (CLB)]; "MALAYSIA: Sabah, Crocker Range, 900 m. 10.iv.2003, local collector" "Ex. Coll. C.L.Bellamy (CLBC)" [1 ♀ (CLB)]; "MALAYSIA: Sabah, Crocker Range, vic. of Mt. Trus Madi iii/iv.2002, local collector" "Ex. Coll. C.L.Bellamy (CLBC)" [1 ♀ (RBH: BPkfb)].

CHARACTERS

Holotype: Male, 9.8×2.6 mm. Head cupreous-green, transgressing into purplish-brown on vertex; dorsal side otherwise dark (brighter and more purplish on sides) bronzed-brown with cupreous apical tenth of elytra; ventral side brownish-bronzed, legs purplish-cupreous, tibiae partly dark green; antennae brown. Dorsal (incl. front)

pubescence inconspicuous except on the apical seventh of elytra, where it is strikingly dense, semierect, making appearance of white fur; ventral side is homogeneously covered by rather dense but short, recumbent, white hair.

Front decidedly transverse ($W:L \approx 1.6:1$), parallelsided; vertex wide ($VW:HW \approx 0.7$); epistome rather deeply paraboloidally emarginated, separated from front only by very shallow and indistinct depression; front almost flat, separated from vertex with shallow arcuate depression; Median line undifferentiated, only with unapparent, very fine stria on vertex. Antennae slender, reaching to near basal fourth of pronotal sides; 1. joint club-shaped, *ca.* $3 \times$ longer than thick; 2. distinctly thinner, ovate; 3. still thinner, as long as 1., 4. elongately triangular, as wide as 1. and as long as 3.; 5.–10. progressively shorter (10. *ca.* as long as wide) and more rhomboidal; 11. of similar length but much narrower, fusiform.

Pronotum transverse, $BW:MW:AW:L \approx 1.25:1.3:1.15:1$), subglobular, widest (but not angular) at basal fourth, arcuately convergent anterad; basal margin very deeply bisinuate with narrowly truncated prescutellar lobe, basal angles somewhat acute, anterior margin almost regularly arcuate with median lobe protruding much further than obtuse apical angles; no trace of “collar”. Disk regularly convex except shallow indication of median sulcus in anterior half; prescutellar pit hardly discernible; punctures moderately coarse but very dense, transversely rugosely confluent on disk; lateral carina fine and inconspicuous in basal half, totally disappearing at midlength. Scutellum small, slightly elongate, subpentagonal, longitudinally depressed, smooth.

Elytra slender ($L:W \approx 3.0$); sides subparallel to midlength and then cuneately tapering to apices (not “caudate”); lateral margins smooth throughout; no trace of subhumeral denticle; apices jointly subtruncated between sharply acute, prominent lateral denticles (sutural angles nearly right); epipleura practically non-existent behind metacoxae. Striae continuous, rather coarsely and very densely punctured; sculpture of interstriae also very dense, irregular, rugoso-punctate, making elytral surface definitely mat; latero-basal depression hardly discernible, but elytral base between scutellum and basal lobe rather deeply foveolate; perisutural depression (including 3 inner interstriae) shallow but distinct (especially in basal half); otherwise elytra regularly convex.

Anterior margin of prosternum almost straight and somewhat swollen; prosternal process convex, moderately wide, sides divergent behind procoxae to form rather prominent lateral angles, apical portion elongately cuneate; sculpture dense, rather fine, transversely rugosopunctate; no lateral striae; proepisterna finely and very densely punctulate, punctures confluent into oblique rugae; median sulcus of metasternum entire; sculpture of metasternal disk consists of dense and fine, simple punctures, lateral parts covered with very dense partly transversely confluent micropunctulation; metepisterna not depressed; metacoxae with very small, barely indicated, obtuse denticle. 1. sternite regularly convex, densely and rather finely punctured medially; sculpture of abdomen otherwise similar to that on metasternal sides; apex of anal sternite very broadly trapezoidally emarginate, emargination totally filled with apically truncated lamella (lateral angles not appreciably protruding). 1. joint of metatarsi very long and slender, almost equal in length to the remaining four together.

VARIABILITY

Paratypes (all apparently females) are larger (11×3 – 12×3.5 mm.) and more robustly built; have cupreous-red front with no trace of green; pronotum in basal half distinctly depressed along midline; apex of anal sternite more arcuately emarginate between prominent, sharply acute lateral denticles, emargination only partly filled with less developed lamina; otherwise practically identical to the holotype.

GEOGRAPHICAL DISTRIBUTION

Borneo: Sabah: Crocker Range.

REMARKS

Recognizable by its mat, very densely sculptured body, strikingly long and dense pubescence of elytral apices, practically non-existent sutural denticle, strongly convex prosternal process with well developed lateral (postcoxal) angles, &c. Sympatric occurrence of at least four species (three of them – *E. brunneus* FISH., *E. strandi* OBB. and *E. apicepubens* sp. n. – very closely related), unless based on some mislabelling, would be surprising and very interesting, but “microgeographical” separation in different valleys seems not improbable.

Pseudhyperantha SND.

Pseudhyperantha SAUNDERS 1869: 5-6.

Type species: *Pseudhyperantha jucunda* SAUNDERS 1869: 6.

REMARKS

One of the aims of the present study has been the attempt at clarification of the phylogenetic and taxonomic placement of the notoriously enigmatic genus *Pseudhyperantha* SND. The historical overview of the problem was outlined in my previous paper (HOLYŇSKI 2009a), so now I will focus on the argumentation (BÍLÝ & al. 2009) and evidence (phylogenetic reconstruction performed herein) formulated since.

BÍLÝ & al. (2009) adduced four characters to declare that the “*placement of Pseudhyperantha into the tribe Stigmoderini by HOLYŇSKI (2008) ... cannot be maintained*” – let us have a closer look at their arguments!

“*Antennal structures of Pseudhyperantha correspond with those of the Buprestini*”. Antennal structures as used by BÍLÝ & al. (2009) have been only very recently defined by VOLKOVITSH (2001) and their phylogenetic or taxonomic value has never been seriously tested; in fact, the particular structure of any sensory organ is an adaptive character depending upon the requirements of its function in the taxon-specific situation – sharpness of other senses (vision, hearing), behaviour (feeding, sexual), climate (temperature, humidity), habitat (density of vegetation, activity in canopy- or bottom-layers), and multitude of others which we have no chance even to imagine – so it would be extremely strange if they were phylogenetically conservative enough to be of great value in higher-level systematics... To be sure, VOLKOVITSH (2001) pre-

sented the results of his work in form of something like a classification, but – as he himself emphatically (italicizing!) stressed [“*It is vital to note that I do not suggest a new classification of the Buprestidae, because in my opinion the creation of a natural classification based on a single character system is impossible*”] – it was a **phenetic** classification of **antennal structures**, not **taxonomic** classification of **a group of beetles**; it is a great pity that BELLAMY (2003) and some subsequent authors accepted it as the system of the **Buprestidae**... BÍLÝ & al. (2009) do not specify the content of their “**Buprestini**”, but most probably it also corresponds to that of VOLKOVITSH (2001), *i.e.* is a heterogeneous medley consisting of the **Trachykelina** HOL., **Buprestina** LEACH, **Lamprocheilina** HOL. and **Agaeocerina** NELS. However, it is enough to look at the descriptions and illustrations in VOLKOVITSH (2001) to see that, on the one hand, the antennal structures are highly variable even in so defined “**Buprestini**”, and on the other that even such “VIC-classification” does not really support BÍLÝ & al.’s (2009) conclusions: “*antennomeres triangular, bilaterally flattened*” should (according to the authors) “*correspond with these of the Buprestini*” but (according to VOLKOVITSH 2001) they are “*transverse or elongate triangular, ... bilaterally flattened*” also in the **Stigmoderini**; “*lateral sensory fields large, formed by B4c sensillae*” do not seem radically different from “*lateral organs: zones or fields of ... B4c sensillae ...*”; only “*U2 sensillae missing*” seems somewhat more “palpable” in comparison with “*short U2 ... sensillae*”, but such regressive (absence) characters are notoriously unreliable!

“*The prosternal process is of buprestine type in Pseudhyperantha ..., with preapical lobes missing*”. Preapical lobes in *Hyperantha* GISTL are no better developed than in *Pseudhyperantha* SND., and generally I am unable to find any character of the prosternal process which in the latter would better “*correspond with*” *e.g.* *Buprestis* L. than it does with the former...

“*Wing venation of Pseudhyperantha (see TOYAMA 1989: 194, Fig. 1) corresponds to Buprestis (see KOLIBÁČ 2000: 152, Fig. 138, ...) rather than a stigmoderine type (see GARDNER 1989: 311, Fig. 66) radial cell (rc) long, vein Rr distinct, Mr stretching far beyond intersection with ‘r-m’, ‘wedge’ cell (2a) closed; ...*”. A glance at the figures quoted by BÍLÝ & al. (2009) immediately shows that the venation in *Pseudhyperantha jucunda* SND. figured by TOYAMA 1989 does indeed resemble that of *Buprestis octoguttata* L. on fig. 138 in KOLIBÁČ 2000, but is still more similar to that of *Chalcophora mariana* (L.) on fig. 136 – so, perhaps, it should be transferred to the **Chalcophorina** LAC.??? Significantly, these comparisons are made between one drawing of single species in KOLIBÁČ 2000 (by the way, the taxon sampling in that publication is generally ridiculously poor – see HOLYŇSKI 2002) with single schematic “*diagram of wing venation of Stigmoderini*” in GARDNER (1989), so no within-“tribe” variability can be assessed, while consulting any relevant publication suffices to find how easily such characters appear and disappear in quite unrelated taxa: *e.g.* the anal cell is closed in *Buprestis* L., but also in *Chalcophora* DEJ., *Chrysobothris* ESCH. (KOLIBÁČ 2000), *Pseudoperotis* OBB. and related genera (TÔYAMA 1987), *Neocuris* SND. (BELLAMY 1989) &c., and open not only in the **Stigmoderina** LAC. examined by GARDNER (1989) but also *e.g.* in *Mastogenius* SOL., *Sphenoptera* DEJ., *Agrius* CURT. (KOLIBÁČ 2000), *Oedisterna* LAC. (TÔYAMA 1987), *Maoraxia* OBB., *Nascioides* KERR. (BELLAMY 1989) and many others;

indeed, according to that latter publication *Anilara* SND. has closed anal cell while in *Notographus* THS. or *Australorhipis* BMY. it is open, albeit all three are classified (BELLAMY 2003) not only in the same “tribe CURINI Holyński, 1988 stat. n.” but even the same “*Anilara* generic group [tribal level] sensu Volkovitsh, 2001”!

“Moreover, the ovipositor of *Pseudhyperantha* ... possesses all characters of *Buprestini*: it is simple and tubular with simple styli and without dorsal valve (more complex structures and dorsal valve are the synapomorphies of the *Stigmoderini* ...”. So, this is a “primitive” structure, probably either plesiomorphy for the **Stigmoderina** LAC. or reversal to the buprestid “groundplan” [such reversals are generally rather frequent, and especially so in organs like ovipositor, being on the one side a part of (notoriously problematic in taxonomic/phylogenetic studies – see HOLYŃSKI 2009b for detailed explanation) “SMRS”, on the other under strong selection pressure dependent upon the circumstances of egg-laying (e.g. characteristics of the substrate)].

“The antennal structured [sic!] of the *Stigmoderini* were treated in detail by GARDNER (1989: 303, Figs. 128-130”, “the prosternal processes of *Stigmoderini* was discussed in GARDNER (1989: 305, figs 61-62”. These formulation are obviously aimed to suggest that somehow GARDNER’s study supports the Authors’ opinion rather than the mine –unfortunately BÍLÝ & al. (2009) do not specify that alleged support... In fact prosternal process is not even mentioned on p. 305 (nor, consequently, in the character-matrix on p. 326), while figs. 61 and 62 do indeed show prosternal processes of two stigmoderine species (both representing the *Stigmodera* ESCH. – *Calodema* C.G. branch, not that including *Hyperantha* GISTL) but the only feature worth mentioning in the context of the present discussion is the great difference between them, illustrating their irrelevance to the problem: indeed, the prosternal process of *Metaxymorpha hauseri* (GARDNER’s fig. 58) is again much different from any of them but virtually identical to that of *Pseudhyperantha* SND.! As to the antennal structures the discussion of the respective characters (no. 9-13, pp. 303-304 in GARDNER 1989) shows that they all are variable, considered by the Author herself as problematic, and consequently none has been shown on the cladogram (fig. 80) or in the discussion of monophyly (p. 325) as the synapomorphy of the **Stigmoderina** LAC.

To sum up: reliance on few “fashionable” characters in most cases leads astray – or, as in this case, to nowhere: the only clear conclusion arrived at by BÍLÝ & al. (2009) has been that “subtribal position and closest affinities of *Pseudhyperantha* within the *Buprestini* remains unclear”, what, in view of the great heterogeneity of their “*Buprestini*” [including so disparate and unrelated (HOLYŃSKI 1993) groups as **Trachykelina** HOL., **Buprestina** LEACH, **Lamprocheilina** HOL. and **Agaeocerina** NELS.], amounts to little more than a statement like “it seems to be a buprestid”...

Thus, BÍLÝ & al.’s (2009) critique proved unconvincing and even on purely phenetical grounds there is no reason to transfer *Pseudhyperantha* SND. from the **Stigmoderina** LAC. [the placement suggested by long list of characters mentioned in my earlier work (HOLYŃSKI 2009a) but unfortunately not addressed by the Authors...] to the “*Buprestini*”. And indeed, the phylogenetic analysis fully confirmed my earlier conclusion, with the only difference that the discussed genus seems to show affinity to *Hyperantha* GISTL

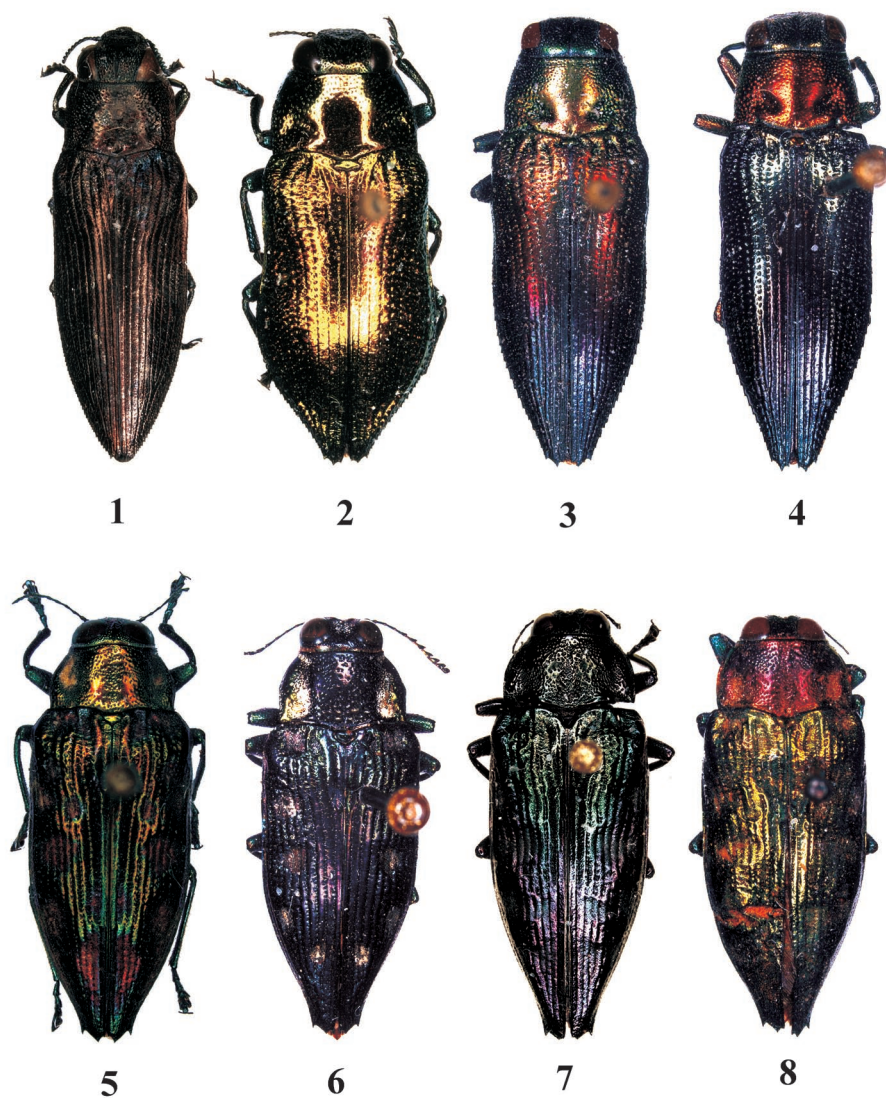
rather than being “close to *Calodema* C.G. and *Metaxymorpha* PARRY.” as suggested – mainly on grounds of geographical proximity – in the paper quoted above.

Indeed, the biogeographic interpretation is an intriguing question: what might have been the distributional history resulting in a SE-Asian “sister-group” of a Neotropical clade? There are three conceivable answers:

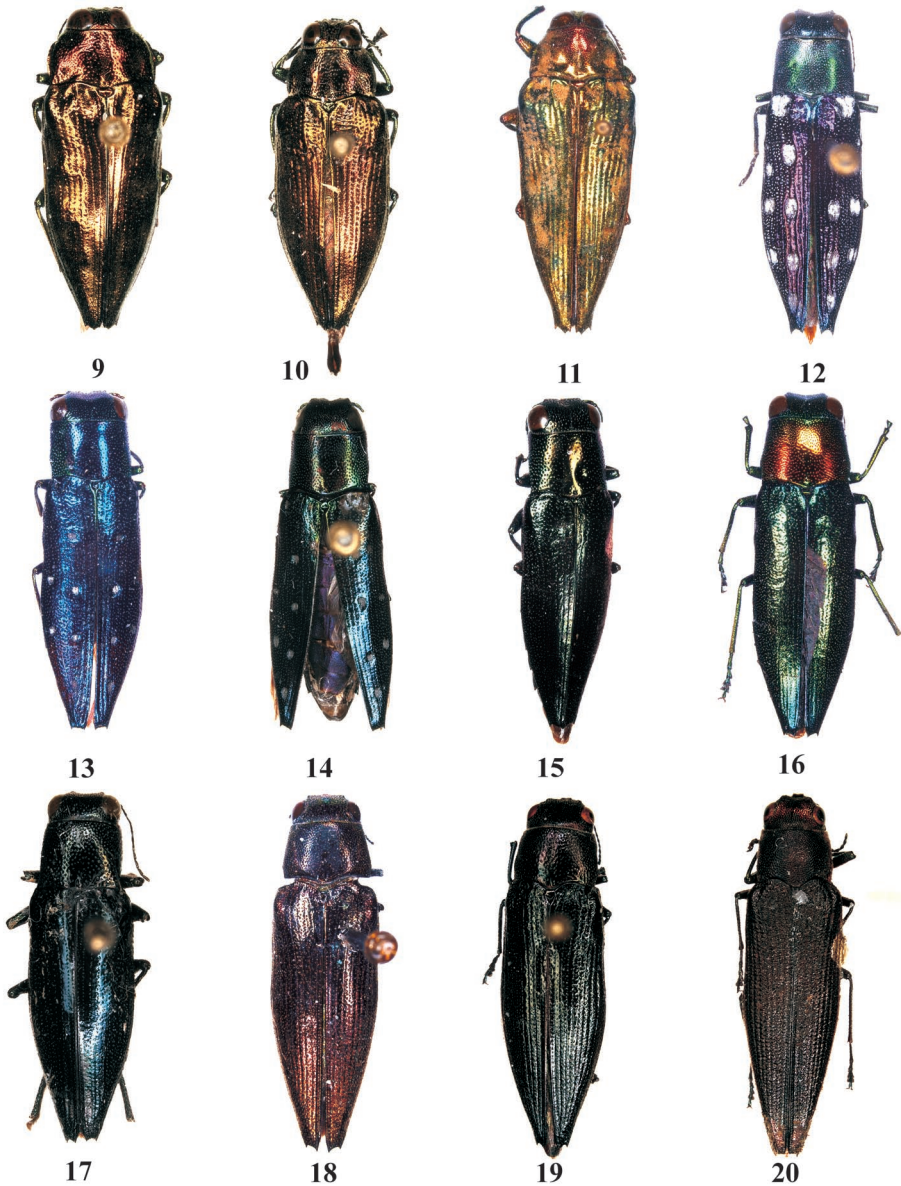
1) The relationships suggested by the cladogram are false: *Pseudhyperantha* SND. is indeed – as hypothesized in my earlier paper – a member of the Australian-New-Guinean subclade of the **Stigmoderina** LAC. According to the most likely “scenario” for such surmise the genus would represent a relatively very young, “derived” end-product of “frontoactive” [=centrifugal] evolution [*Stigmodera* ESCH. → *Calodema* C.G./*Metaxymorpha* PARRY. → *Pseudhyperantha* SND.] what does not seem easy to reconcile either with the great degree of differentiation of the SE-Asian genus, nor with the distribution of the Notogaeon clade (predominantly arid areas of continental Australia, scarcity on New Guinea, not a single representative to the north-west of the LYDEKKER’S Line). However, naturally, the hypothesis cannot be completely disregarded: there is some possibility that the evolution was in fact centroactive [=centripetal] and *Pseudhyperantha* SND. represents an ancient branch “pushed out” to the north by post-Oligocene deterioration of climate (decreasing temperature and increasing aridity) and more derived competitors.

2) The present S-American – SE-Asian disjunction is a “relict” of originally Inabresian [India – tropical Africa – Brasil: JEANNEL 1942] or “tropico-Gondwanan” distribution, being “l’exemple typique de la ségrégation centrifuge qui aurait lieu, selon JEANNEL (1942) chez un grand nombre des lignées d’Inabrésie” (SZYMCAKOWSKI 1969); puzzling in this case is the present absence of any representative of the **Stigmoderina** LAC. in Africa (incl. Madagascar) – although this may be the result of subsequent extinction (or merely appearance “created” by insufficient collecting...).

2) The most plausible (like in the case of the **Phrxiina** COV. – see below) seems the hypothesis of Laurasian origin: in the early Tertiary the *Hyperantha* GISTL – *Pseudhyperantha* SND. branch of the subtribe was widely distributed over the – then subtropical – areas of what is presently temperate Eurasia and N-America, the recent genera being the end-products of the differentiating frontoactive evolution during and after the southward withdrawal under pressure of the post-Oligocene climate deterioration (in this scenario the absence in Africa can be easily explained by formidable barriers – latitudinally stretched mountain chains, seas, deserts – separating that continent from the increasingly cool Europe).



1. *Ovalisia (Cinyrisia) deceptiva* sp. n. HT (UN807) – Borneo: Sabah: Ranau, 3 VI 2010; 2. *Melobasina (Ulaikoilia) hoscheeki* sp. n. HT ♀ (KBIN) – Luzon: ad Bayombong, 14 I 1916; 3. *Melobasina* (s. str.) *fossicollis* KERR. HT ♀ (KBIN) – Tulagi I.; 4. *Melobasina* (s. str.) *chrysocyanea* sp. n. HT ♀ (RBH: BPKcp) – Guadalcanal: Matanikau Riv., 6 VIII 1958; 5. *Haplotrinchus (Transwallacea) connectens* sp. n. HT ♂ (TNS) – N.Guinea: Irian: Timika, V 2002; 6. *Haplotrinchus (Transwallacea) amicornum* sp. n. HT ♂ (RBH: BPCxb) – Guadalcanal: Tigakvavatu, 8 VIII 1963; 7. *Haplotrinchus* (s. str.) *inaequalis negrophilus* ssp. n. HT ♀ (CSCA) – Negros: Canla-on, Don Salvador, 4 V 2009; 8. *Haplotrinchus* (s. str.) *inaequalis pyrrhonotus* ssp. n. HT ♀ (RBH: BPKda) – Masbate: Aroroy



9. *Haplotrinchus* (s. str.) *incertus* sp. n. HT ♂ (RBH: BPkep) – Calayan Is., VII 2002; 10. *Haplotrinchus* (s. str.) *borneanus* sp. n. HT ♂ (CSCA) – Borneo: Sabah: Crocker Rge., 19 IV 2003; 11. *Haplotrinchus* (s. str.) *amplius* sp. n. HT ♀ (RBH: BPghs) – Luzon: Imugan, 30 V 1916; 12. *Phrixia* (s. str.) *matrismeeae* sp. n. HT ♂ (RBH: BPj-x) – Java: Djakarta, 1953; 13. *Phrixia* (s. str.) *tricolor* sp. n. HT (KBIN) – Mindanao: Kolambugan, I 1915; 14. *Phrixia* (s. str.) *inopinata* sp. n. HT ♂ (CSCA) – Mindanao: Davao: Maco, X 1946; 15. *Phrixia* (s. str.) *subtilis* sp. n. HT (BPBM) – N. Guinea: PNG: Angoram, 14 VIII 1969; 16. *Phrixia* (s. str.) *major* sp. n. PT ♀ (RBH: BPj-w) – Babuyan Is., V 2003; 17. *Phrixia* (*Stephansortia*) *archboldi* sp. n. HT ♂ (CSCA) – N. Guinea: PNG: Fly Riv.: Sturt I., 19 X 1936; 18. *Exagistus malayanus* sp. n. HT (BPkdd) – Penang; 19. *Exagistus bellamyi* sp. n. HT ♀ (CSCA) – Borneo: Trus Madi, 28 III 2003; 20. *Exagistus apicepubens* sp. n. HT ♂ (CSCA) – Borneo: Trus Madi, 27 III 2003

PHYLOGENY

Taxon sampling and procedures

As in my other recent publications, phylogenetic reconstructions have been done by the currently available (provisionally “labelled” as 5.2) version of MICSEQ (general idea of the program, and procedure used at the earliest stage of its development, was outlined by HOLYŃSKI 2001; the present form differs in being almost fully “computerized” and some sources of possible errors having been discovered and eliminated). The target taxa [subtribes as defined in HOLYŃSKI 1993] are: the subtribe **Haplotrinchina** HOL. [I have been able to include 3 genera with 6 subgenera: *Cardiaspis* SND. (3/3), *Haplotrinchus* KERR. s. str. (6/10), *Transwallacea* sg. n. (3/3), *Nesotrinchus* OBB. (3/3), *Melobasina* KERR. s. str. (4/4) and *Ulaikoilia* B.K.V. (1/1)], the Indo-Pacific representatives of the subtribe **Phrxiina** COB. [included: *Paraphrixia* SND. (1/1), *Phrixia* DEYR. s. str. (6/6), *Stephansortia* THY. (1/1) and *Exagistus* DEYR. (6/6)], and the notoriously controversial genus *Pseudhyperantha* SND. (3/3) [in parentheses number of species/subspecies included in the analysis]. As the “internal” (for particular target taxa) and “external” (to root the entire tree) outgroups I have included some extralimital representatives of the target groups [*Cinyra* C.G., *Spectralia* CSY., *Aglaostola* SND., *Hilarotes* SND., *Hyperantha* GISTL, *Calodema* C.G.] and several others [*Ovalisia* KERR. (all subgenera), *Poecilonota* ESCH., *Dicerca* ESCH., *Psiloptera* DEJ. (*Spinthoptera* CSY.), *Buprestis* L. (*Eurythyrea* DEJ. and *Yamina* KERR.), *Melobasis* C.G. (s. str. and *Diceropygus* DEYR.), *Philanthaxia* DEYR., *Euplectalecia* OBB., *Chrysesthes* DEJ., *Eupodalecia* OBB., and *Panapulla* NELS.; the latter not seen (characters taken from the original description – NELSON 2000 – intuitively supplemented with most likely ones) and, like (for other reasons: see below) *Philanthaxia* DEYR., excluded from final cladogram]. Supraspecific terminal taxa (subgenera and genera) have been usually represented by one (supposedly most “representative” among those available for study) of their species, only in some cases hypothesized “Groundplan” (presumably plesiomorphous character-states) or (*Poecilonota* ESCH. and *Dicerca* ESCH.) previously (HOLYŃSKI 2011) reconstructed ancestor was chosen.

The first, preliminary analysis (1), including all the above-mentioned 73 taxa, served as the basis of general orientation, detection of weak points and planning of more specifically focused study. In the next one (2) *Euplectalecia* OBB., *Chrysesthes* DEJ. and *Eupodalecia* OBB. were omitted and clades well supported in 1 and intuitively acceptable were represented by their “reconstructed ancestors”. These two analyses showed two main branches – provisionally labelled as the *Phrixia*- and *Haplotrinchus*-clade. The following step (3), aimed as the more exact resolution of the *Phrixia*-clade, included all the respective terminal groups of the 2. analysis while those of the *Haplotrinchus*-clade were further strongly (to 5 moderately supported in the former two steps) “compressed”; the opposite was applied to the reconstruction 4. At last, special additional partial [including only *Cardiaspis* SND., *Haplotrinchus* KERR., and ancestors of *Melobasina* KERR. (U, SS) and *Ovalisia* KERR. (UU) as outgroups] analysis was performed to incorporate *Haplotrinchus connectens* sp. n., received only when the main phylogenetic reconstruction had already been done. The results were evaluated

according to the degree of support (**SQ** – see **Abbreviations** above) for incongruent (between analyses) branchings and external (*e.g.* biogeographical) evidence, and summarized as the final tree (figs. 1-2) commented below.

Cladistic relationships

As remarked above, *Panapulla* NELS. – unknown to me in nature and only experimentally, with some character-states only hypothesized, included in the initial analyses – has been disregarded from the final cladogram. In the **1.** analysis it appeared as the sister-group of the clearly unnatural clade *Philanthaxia* DEYR. + **LLL** [*Euplectalecia* OBB. + (*Chrysesthes* DEJ. + *Eupodalecia* OBB.)]; in reconstructions **2.** and **3.** has been “recovered” as sister of *Spinthoptera* CSY. [here and hereafter I will refer to the supra-specific terminal taxa by their *subgeneric* names alone]; while the cladogram **4.** showed it as part of the unresolved basalmost three-lineage polytomy. Similarly disregarded has been *Philanthaxia* DEYR., whose position on cladograms was also extremely unstable [sister to **LLL** on **1.**, to the clade *Poecilonota* ESCH. + (*Ovalisia* KERR. + *Melobasina* KERR.) on **2.**, not analysed in reconstructions **3.** and **4.**] and evidently was disturbing rather than helpful in reconstruction of relationships between the remaining taxa.

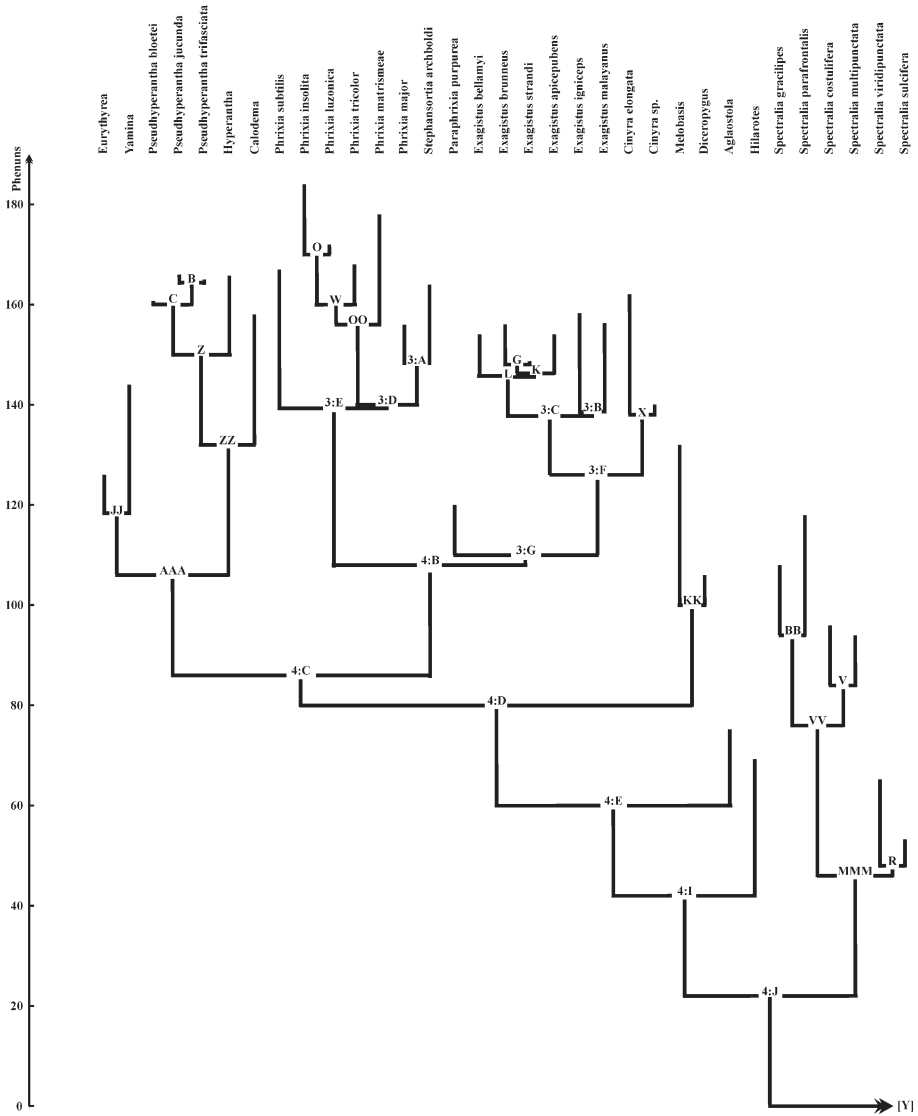
The clade *Euplectalecia* OBB. + (*Chrysesthes* DEJ. + *Eupodalecia* OBB.) appeared always in the same arrangement and always (on the **1.** cladogram together with *Philanthaxia* DEYR. and *Panapulla* NELS.) at or near the base, so **LLL** has been left as the “external outgroup”, formally a sister to all the others: [**Z**]. From [**Z**] evolved the ancestors of the *Phrixia*- and *Haplotrinchus*-clades (respectively **4:J** and [**Y**]). The consecutive basal side-branches of the *Phrixia*-clade will not be analysed here in detail, as they concern non-target, poorly taxon-sampled genera (respectively *Spectralia* CSY., *Hilarotes* SND., *Aglaostola* SND. and *Melobasis* C.G.), and a reliable resolution of the relationships between and within them would anyway demand a different study; one point, however, seems worth mentioning. *Cinyra* C.G. and *Spectralia* CSY. were traditionally considered as congeneric [CASEY (1909) described the latter as a subgenus of the former, OBENBERGER (1930) considered them synonymous] or (HOLYŃSKI 1993) almost so, and closely related to *Phrixia* DEYR.; on the other hand BELLAMY (2003) – following VOLKOVITSH’S (2001) suggestions – placed them far not only from one another but also from the **Phrxiina** COB. However, according to the present reconstruction all belong to the *Phrixia*-clade, although while *Cinyra* C.G. appears well within the subtribe (as the sister-group of *Exagistus* DEYR.), *Spectralia* CSY. makes the basal-most branch, separated from the **Phrxiina** COB. *s.str.* not only by *Hilarotes* SND. and *Aglaostola* SND. but even *Melobasis* C.G., **Buprestina** LEACH and **Stigmoderina** LAC.!

The node **4:C** connects the latter two subtribes with the **Phrxiina** COB. (please note, however, that only few of the many potentially relevant suprageneric groups have been included in the analysis, so it would not be justified to consider these three as actually closest relatives, or treat the inferred characters of **4:C** as features of their true common ancestor!). Only the next “generation”, **AAA** and especially **4:B**, can be considered more or less real approximation of ancestral taxa. As regards **AAA**, its “status” as the common ancestor of the **Buprestina** LEACH and **Stigmoderina** LAC., though conceivable (the close affinity of these subtribes had never been seriously proven – nor

has this problem been addressed in the present paper – but they are usually placed near to one another), cannot be considered well supported, therefore I will not discuss its characters – nor those of its buprestine “daughter”: **JJ** – herein. In fact, reconstruction of phylogenetic structure of the **Stigmoderina LAC. (ZZ)** falls also beyond the scope of this publication: I have only attempted (the taxon- and character-sampling has been adjusted to this task only) to solve the notorious dispute as to the taxonomic placement of *Pseudhyperantha* SND. – and the cladogram apparently supports [*contra* BILÝ & al. (2009)] the hypothesis advocated by me (HOLYŇSKI 2009a): the genus clearly belongs to the **Stigmoderina LAC.**, and not even at its base but deeply “nested” within (at least it appears – with strong support: SQ=14/25! – more closely related to *Hyperantha* GISTL than the latter is to *Calodema* C.G.).

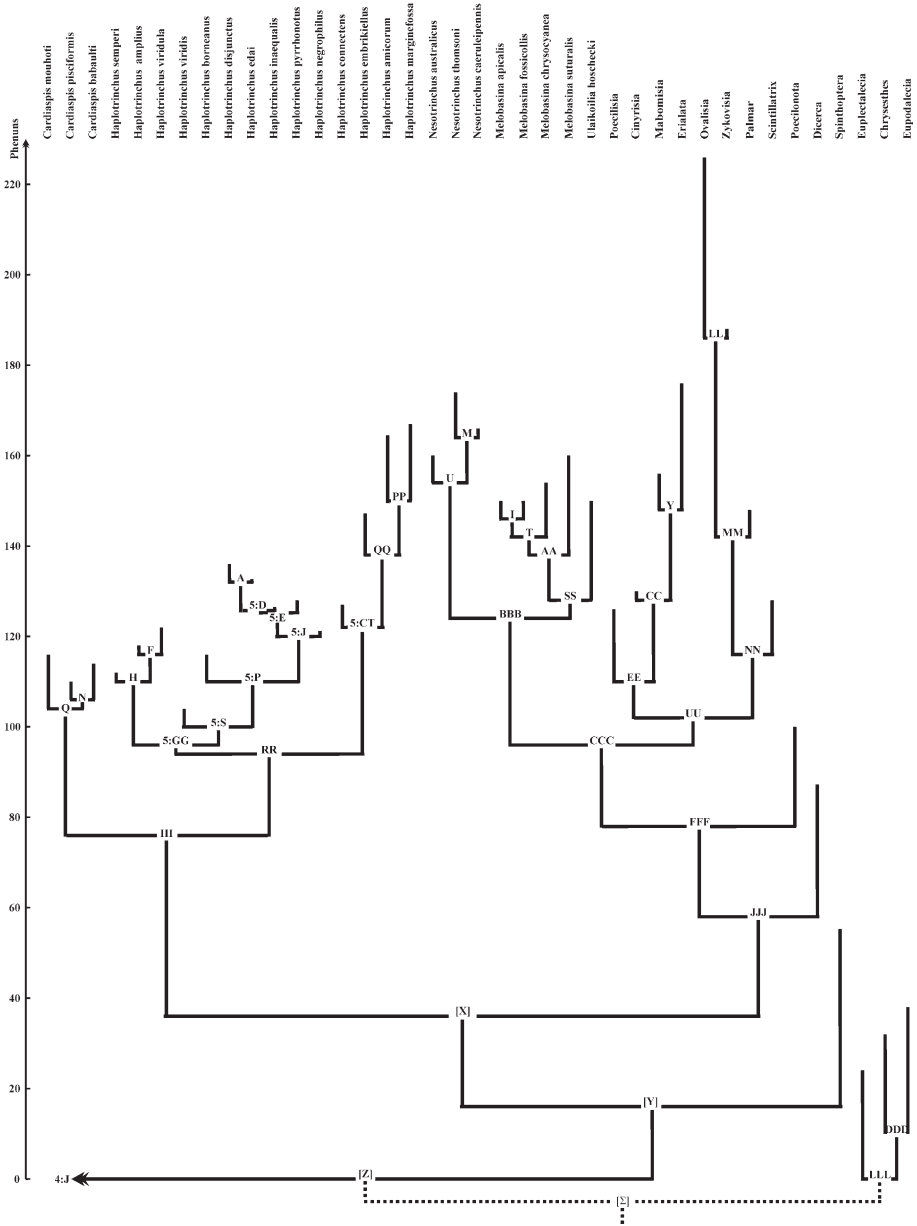
The common ancestor of the **Phrxiina COB. (4:B)** has been reconstructed as a small (10-15 mm.), slender (L:W \approx 3.0-3.3), dorsally glabrous beetle with uniformly green pronotum and contrastingly bluish-violaceous elytra, without non-metallic pattern (except testaceous labrum) or dfp spots; labrum and cheeks simple (non-carinate), antennal cavities open, front flat or slightly convex, rather finely regularly punctured, supraantennal carinae inconspicuous, other ridges on front lacking; vertex similarly wide (V:W \approx 0.5-0.6) in both sexes; pronotum nearly parallelsided, without distinct depressions, median line undifferentiated, lateral carina reaching to *ca.* midlength; scutellum small, *ca.* as long as wide; elytral sides smooth (not denticulate), cuneately tapering in apical half, apices bidentate, rows of punctures moderately fine, all interstriae flat, surface otherwise normally punctulate without dfp spaces, epipleura entire (reaching to apices), basal (mesepimeral) denticle well developed; anterior margin of prosternum almost straight, neither swollen nor elevated, prosternal process sparsely punctured, lateral margin undifferentiated, no pro-mesosternal ledge; mesepisterna extending to near epipleura, mesosternum not fully divided by sternal cavity, metasternum and metepisterna flat, no metacoxal denticle; 1. sternite regularly convex, no distinct lateroapical lobes or lateral groove on sternites, sides of sternites without smooth reliefs or dfp patches; mandible simply rounded; antennae long and slender, 3. joint subequal to 4.; 1. metatarsomere robust but almost as long as 2. and 3. together; anal sternite without median carina or apical blade, bidenticulate in both sexes. So, superficially it seems to have resembled recent *Paraphrixia* SND.

It is not easy to “place it in time and space”. The current distribution of its descendants – S-America, Mauritius in southern Indian Ocean, and insular (incl. Malay Peninsula; *Phrixia fossulata* KERR. was described from “Siam” but probably also from the peninsular part of the country) SE-Asia to New Guinea – may suggest the Gondwanan, Mesozoic origin of the clade; this, however, is difficult to reconcile with the lack of its representatives in Africa, Australia and India [*P. auricollis* (C.G.) was described from “*Indes or.*” what, however, in 1836 might mean almost anything in SE-Asia; I am not aware of any other record from Asian continent beyond Isthmus of Kra]: the Insulindia has never been a part of Gondwana, so the ancestors of *Phrixia* DEYR. and *Exagistus* DEYR. would have either dispersed there from Australia or arrived on northward moving India; moreover, under such scenario the S-American lineage (*Cinyra* CSY.) would be



Cladogram I. Phylogenetic relationships within the *Phrixia*-clade

Ancestors are denoted as single, double or triple majuscules; those without either numerals or square brackets resulted from the 1. reconstruction; those with numerals (3. or 4.) from the respective further steps of analysis; those within square brackets are basalmost ones, supported only by heuristic conventions of MICSEQ. The scale on the left of each figure shows the phenetic distance in phenons (pu – see Abbreviations); please note that these distances can be considered as “additive” only for estimation of the “amount of evolution” but are definitely not additive for direct comparison between taxa (either terminal or “reconstructed ancestors”) not being immediate neighbours: due to homoplasies (reversals, parallelisms, convergences) the actual phenetic distance between any pair of non-neighbours will be usually (sometimes considerably) shorter than those counted along branches of the tree.



Cladogram II. Phylogenetic relationships within the *Haplotrinchus*-clade (explanations see cladogram I)

expected to represent one of the basal branches of the **Phrxiina** COB., while according to the analysis it seems to be deeply nested in the Indo-Pacific clade!

Another possibility is the hypothesis of Laurasian origin, universally advocated in similar situations by biogeographers (e.g. DARLINGTON 1953) before the general acceptance of plate tectonics and in the last years increasingly regaining popularity: the Eocene ancestors of the extant genera, widely distributed over the now temperate but then subtropical areas of the present Holarctis, would have escaped the progressive cooling by withdrawal southwards; this was relatively easy in E-Asia and America, whereas Mediterranean Sea and continuous latitudinal bands of mountains and deserts prevented invasion of subsaharan Africa [*“Because there was a continuous land connection from East Asia to the equatorial zone, many Boreotropical elements were able to find refuge in the forests of Southeast Asia. ... With respect to North America, Northern Megathermal elements may have been able to find refuge along the southern margin of the North American Plate, but could not disperse to the equatorial zone until the formation of the Isthmus of Panama in the Pliocene ... As a result, many more Northern Megathermal elements are likely to have become extinct in the Americas than in Southeast Asia. Many of those that did survive, and have parallel occurrences in Southeast Asian forests, are now extant as the amphi-Pacific element ... For Europe, the east-west barriers of Tethys, the Alps, and the Sahara combined to limit equatorward dispersal to Africa to just few taxa; hence, there are barely any true Northern Megathermal elements in the present day African rainforests...”* – MORLEY (2006)]. This conception explains the absence of the **Phrxiina** COB. in Australia, India and Africa as well as their greater diversity in the Indo-Pacific than in the Neotropical Region, but makes still more difficult (it was difficult also for the Gondwanan scenario...) to plausibly interpret their occurrence on Mauritius, a relatively young [*“Mauritius ... is a highly dissected edifice representing eroded remnants of a hotspot volcano, with basalts ranging from 7.8-0.2 millions of years ... in age”* – POLHEMUS & POLHEMUS (2008)] island separated by five thousand km. of ocean water from the nearest SE-Asian coast. Some oversea dispersal must have been involved anyway – the most likely seems to be that the ancestors of *Paraphrxiina* SND. inhabited SE-Asia already in Oligocene and have taken the opportunity *“created as India moved forward, since a string of islands formed along its trailing edge ... the NinetyEast Ridge ... they may have facilitated dispersal between India/Madagascar and the Australian Plate in the Early Tertiary”* (MORLEY 2003) – these “stepping stones” (including also the “paleo-islands” of the *“Chagos-Laccadive volcanic trail”* (ALI & AITCHISON 2008) might have also enabled the dispersal between SE-Asia and Mascarene Plateau (whose currently subaerial fragments are Reunion and Mauritius; see also e.g. CANDE & STEGMAN 2011). Taking all this into consideration, the Laurasian origin of the **Phrxiina** COB. seems more likely than the Gondwanan alternative, *i.e.* their early Tertiary ancestor (**4:B**) has lived somewhere in the then subtropical areas of what is presently temperate Europe, Siberia and N-America.

In one of its “daughters” **3:E** several modifications appeared on head (cheeks carinately produced beneath eyes, closed antennal grooves, anteriorly depressed front), pronotum (short lateral carina), undersurface (depressed metepisterna, conspicuous lateroapical lobes to sternites) and legs (more robust 1. metatarsomere) – this was the

ancestor of *Phrixia* DEYR., having developed probably in the southern peripheries of the Asian part of the parental area (perhaps somewhere in the present China) and then pushed southwards as a consequence of the Oligocene global cooling. Further development of this branch is difficult to reliably reconstruct: as 4 out of 5 Philippinean species but only one of the 8 known from the Indo-Malayan area have been available for the present study, much of what will be written below may prove the artifact of taxon sampling rather than the true story. However, no evidence is ever “complete”, so we must form our hypotheses always in accord with the available data... Keeping this reservation in mind, the cladogram suggests that the **3:E** (perhaps outcompeted on the continent by members of the **3:G** clade) has finally “landed” on what presently is the Philippine Archipelago. The earliest offshoot of that Philippinean branch was the southernmost lineage which have then dispersed to New Guinea to evolve into *P. subtilis* sp. n.; rather great “amount of evolution” (smaller size, pronotum almost concoloured with elytral base, very fine punctulation of elytral striae, carinately elevated anterior margin of prosternum, striatomarginate prosternal process, deeply sulcate metasternum, no dfp patches on sternites) distinguishing this species from **3:E** is consistent with long-distance dispersal using several “stepping stones” – whether recently through the Talaud Islands and Moluccas or earlier (Miocene?) along the intermittent island chains forming the northwestern prolongation of Melanesian Arcs (HALL 2002), remains uncertain.

The ancestor of all the remaining species of *Phrixia* DEYR., **3:D**, seems to have remained in Philippines and – accordingly – has not changed (at least in the analysed characters): **3:D=3:E**. In one of its “daughters”, **OO**, pubescent dfp spots appeared on elytra, rows of elytral punctures transformed into continuous striae, lateral denticles on apex of male anal sternite disappeared (apex became simply emarginated) – the next split seems to give some (even if slight) support to the hypothesis that this species lived somewhere on the western part of the Philippinean Archipelago (perhaps what is now Mindoro or western Visayas), from where one branch (represented in the analysis by Javanese *P. matrismae* sp. n.: lateral carina on pronotum reaching to ca. midlength, elytral apices definitely caudate, punctures in striae coarse, inner interstriae convex, apical margin of prosternum carinately elevated, apical blade of anal sternite inconspicuous) dispersed to the Sunda Shelf and the other (**W**: pronotal disk violaceous, sides contrastingly different, elytra slightly caudate, apex of anal sternite simply truncated) spread throughout the Philippines. Southern branch of **W** evolved into *P. tricolor* sp. n. (characterized by smaller body, very wide vertex, shallow but distinct lateral depressions on pronotum, elytral striae represented by rows of isolated punctures) while the northern populations (**O**: labrum metallic, elytra concolorous with pronotum, apex not caudate) expanded northwards to Luzon (unicolorous green *P. luzonica* BMY.) and southwards to Mindanao (*P. insolita* sp. n. with swollen apical margin of prosternum and slightly depressed 1. sternite).

3:A, the eastern-Philippinean “sister” of **OO** differed from their “mother” (**3:D**) in metallic colour of labrum and in shape of pronotum (sides shallowly sinuate before base and distinctly convergent anteriorly); it has probably been outcompeted in large Philippinean islands by expanding members of the **OO**-lineage and dislodged northwards to

the Babuyan Islands (*P. major* sp. n., characterized by cupreous pronotum, slightly caudate elytral apices and lack of dfp patches on abdomen) and southwards to New Guinea [sg. *Stephansortia* THY. – represented in the analysis by *P. (S.) archboldi* sp. n. – with sulcate median line and entire lateral carina of pronotum, emarginate prosternal apex, mesosternum fully divided by sternal cavity, and deeply sulcate metasternum].

The sister-group of *Phrixia* DEYR. (**3:E**) is **3:G**, differing from the ancestor (**4:B**) only in cupreous pronotum. One of its descendants is the biogeographically somewhat enigmatic (see the discussion above) and morphologically distinctive (smaller and wider, contrastingly coloured, with pronotal carina extending beyond midlength, anal sternite medially carinate with simply truncated apex without distinct apical blade) *Paraphrixia* SND. from Mauritius; the other is also rather well differentiated (uniformly bronzed-brown colouration, pronotal sides shallowly sinuate basally and markedly convergent in apical 2/3, median line undifferentiated, elytral striae continuous) **3:F**, which, in turn, “spawned” the ancestors of now almost exclusively Bornean *Exagistus* DEYR. (**3:C**: distinct dorsal pubescence, vertex wider than 0.6 of head width, elytra discernibly caudate, sternal cavity extending to metasternum, apex of anal sternite slightly dimorphic sexually) and Neotropical *Cinyra* CSY. (**X**: colouration brownish-black, width of vertex less than 0.5 of head width, pronotum with deep laterobasal depressions, 1. metatarsomere robust). Of the two lineages of *Exagistus* DEYR. one (**L**) was but slightly (metallic labrum, swollen apical margin of prosternum) differentiated from **3:C** and almost identical to the recent *E. strandi* OBB. (the only difference apparent from the reconstruction being anteriorly depressed front of the latter). One of its “daughters” – *E. bellamyi* sp. n. – differs in basally parallelsided pronotum, its longer lateral carina, and robust 1. metatarsomere; while the second (**K**) seems to have not changed at all and given rise to also almost (except the above-mentioned frontal depression) unchanged **G** apparently identical to *E. strandi* OBB.; the descendant of **G** [*i.e.*, in fact, of *E. strandi* OBB.] is also somewhat more differentiated (sides of pronotum parallelsided in basal half, non-caudate elytra, robust 1. metatarsomere; first and third of these are convergent with *E. bellamyi* sp. n. – “underlying synapomorphies” of SÆTHER 1979?) *E. brunneus* OBB. The “sister” of **G**, *E. apicepubens* sp. n., differs from their “mother” (**K**) in straight basal part of pronotal sides, swollen apical margin of prosternum, and sulcate metasternum. The ancestor (**3:B**) of the second branch of *Exagistus* DEYR. did not, according to the reconstruction, differ from **3:C**, but gave rise to a pair of rather strongly differentiated “daughters”: *E. igniceps* DEYR. (basally straight pronotal sides, densely punctured prosternal process, medially depressed metasternum, short antennae, more prominent lateral denticles of anal sternite) and *E. malayanus* sp. n. (coarse frontal sculpture, undifferentiated median line of pronotum, not caudate elytra, shortened epipleura, laterally striated prosternal process, and robust 1. metatarsomere).

The analysis of the *Haplotrinchus*-clade [**Y**] produced rather confusing results. The position of *Spinthoptera* CSY. as the sister rather than (together with *Dicerca* ESCH.) in-group of [**X**] can be ascribed to very weak [SQ=16/17] support for [**X**]; pairing (**JJJ** + **III**) was hardly better supported than (**JJJ** + *Spinthoptera* CSY.). More significant is – astonishing to me, but in agreement with VOLKOVITSH’S (2001) classification of antennal structures [accepted as the general taxonomic system of the **Buprestidae**

LEACH (excl. **Agrilinae** CAST.) by BELLAMY 2003 and some later authors] and with the conclusions of BÍLÝ & al. 2009 – the split between the **Haplotrinchina** HOL. s. str. (III) and the somewhat strange-looking group (JJJ) including *Dicerca* ESCH. and **Poecilonotini** JAK. sensu BÍLÝ & al.: **Poecilonotina** JAK. (*Poecilonota* ESCH. + *Ovalisia* KERR.) and **Nesotrinchina** B.K.V. (*Melobasina* KERR.). The situation is not quite clear, because in various reconstructions the placement of *Melobasina* KERR. varies between the sister-position to *Ovalisia* KERR. alone (as in the analysis accepted here) and that of [*Dicerca* ESCH. + (*Poecilonota* ESCH. + *Ovalisia* KERR.)], in all cases with very poor support (SQ=23/25, 25/27 or so), but if further studies [with different outgroups and characters, and especially with inclusion of *Haplotrinchus* (?) *splendens* WATH.] confirm these results, the exclusion of the **Nesotrinchina** B.K.V. from the **Haplotrinchina** HOL. (as suggested by BÍLÝ & al. 2009) must be accepted.

If so, the content of the **Haplotrinchina** HOL. s. str. is restricted to but two Indo-Pacific genera: *Cardiaspis* SND. and *Haplotrinchus* KERR., whose common ancestor (III) was a moderately large (ca. 20 mm.) and moderately elongated (L:W somewhat less than 3), uniformly green, practically glabrous beetle with metallic labrum and tarsi, undifferentiated cheeks, closed antennal cavities; front regularly but not densely punctured, anteriorly deeply depressed, supraantennal carinae somewhat prolonged upwards, oblique ridges prominent; vertex narrow, sexually dimorphic; sides of pronotum straight and subparallel in basal part, no prebasal but distinct lateral depressions, sulcate midline, entire lateral carina; scutellum small, but slightly wider than long; elytra caudate, its lateral margin smooth, apex tridentate, striae continuous, moderately punctured, interstriae flat, no dfp areas, epipleura entire, with prominent mesepimeral denticle; anterior margin of prosternum emarginate, neither swollen nor carinately elevated; prosternal process furrowed laterally and sparsely punctured on disk; no promesosternal ledge, mesosternum fully divided, metasternum medially sulcate, metepisterna and 1. sternite flat; no metacoxal denticle; sternites grooved laterally, with undifferentiated lateroapical angles, no lateral reliefs and inconspicuous dfp patches; mandibles normal, antennae slender with 3. joint subequal to 4., 1. metatarsomere rather robust but subequal in length to 2.+3. united; anal sternite without median carina, apical blade conspicuous, apex bidenticulate, but slightly dimorphic sexually; if found today, it would have probably been identified as a representative of the nominotypical subgenus of *Haplotrinchus* KERR.

III gave rise to two branches, represented in recent fauna by the genera *Cardiaspis* SND. on the continental and *Haplotrinchus* KERR. on the insular part of the Indo-Pacific Region. In the proto-*Cardiaspis* (Q) frontal sculpture became irregular, basal part of pronotal sides rounded, scutellum strikingly large and cordiform, anterior margin of prosternum deeply incised, ventral profile markedly angular (conspicuous pro-mesosternal ledge), anal sternite medially carinate. One of its “daughters”, the Indochinese *C. mouhoti* SND., became bigger, with pronotal sides convergent from the base, median line undifferentiated, elytral striae very finely punctulated, and furrow separating lateral rim of prosternal process from disk disappeared; its “sister” on the western side of the Bay of Bengal, N, remained almost unchanged (only lateral dfp patches on sternites

became more contrasting). The specific distinction between the descendants of **N** – *C. pisciformis* THY. (1. sternite deeply sulcate) and *C. babaulti* THY. (elytra cupreous-red, fine frontal sculpture, fine marginal stria on prosternal process) is questionable, but all known to me specimens of the former have been collected on Ceylon or extreme south of India (S of Kaweri Riv.), while the latter was originally (THÉRY 1928) described from Surada (Orissa) and the only specimen examined by me comes from Ramandorog (N-Karnataka), so subspecific differentiation seems the most likely.

RR, the proto-*Haplotrinchus*, differentiated from **III** on the Malay Archipelago by having developed deep lateral depressions on pronotum, definitely transverse scutellum, longitudinally depressed metasterna, and lateroapical angles of sternites produced backward as sharply angular lobes. One of its descendants, **GG** (the ancestor of *Haplotrinchus* KERR. s. str.), probably remained on the Sunda Shelf without having significantly changed (only shallow prebasal depressions appeared on pronotum), and then spread through Palawan to Mindoro and Luzon where the characteristics of the *H. viridulus* (OL.) group (fine frontal sculpture, lack of furrow between disk and lateral rim of prosternal process, short 3. antennal joint, slender 1. metatarsomere) developed. The ancestor (**H**) of this group further differentiated: the northernmost population remained nearly unchanged (only lateral dfp patches on sternites disappeared) as *H. semperi* THY., in those (**F**) inhabiting central and southern parts of the area sides of pronotum became more rounded basally and convergent already at midlength, and prebasal depressions markedly deep. And again: the central/southern Luzonese populations remained practically unmodified (the only discernible exception being the return to somewhat coarser frontal sculpture in *H. amplius* sp. n.), while those occurring on Mindoro developed (shallow lateral depressions on pronotum, flat metasternum and 1. sternite) into *H. viridulus* (OL.), which ultimately spread over all the Philippine Archipelago to become sympatric with both its closest relatives.

After separation of **H**, the **5:GG**-populations remaining on the Sunda Shelf underwent slight modifications (frontal depression restricted to anterior part, metasternum flat) to become **5:S**, whose westernmost (Sumatra, Malay Peninsula) descendant (also little changed: deep basal depressions and not sulcate median line of pronotum) is the recent *H. viridis* (DEYR.), while somewhat more strongly differentiated (more robust body, less transverse scutellum, flat interstriae, nearly flat 1. sternite) Bornean ancestor (**5:P**) of the *H. [inaequalis* (DEYR.)]-superspecies left one representative (*H. borneanus* sp. n.: somewhat smaller, cupreous-bronzed) on the western side of the HUXLEY'S Line but otherwise spread eastwards (most probably through Sulu Arch. to Mindanao) to become **5:J** (coarse and irregular frontal sculpture, basally rounded pronotal sides, deeply incised anterior prosternal margin, and deeply sulcate metasternum). Expansion to Negros resulted in very dark, multicoloured *H. i. negrophilus* ssp. n., whereas the remainder evolved (front deeply depressed throughout, transverse scutellum) into **5:E**, apparently – according to the analyzed characters – identical to *H. inaequalis* (DEYR.) s. str., which spread south- (Moluques) and northwards. There some insular populations acquired local characteristics of subspecific value: cupreous and distinctly micro-sculptured pronotum on Masbate (*H. i. pyrrhonotus* ssp. n.); smaller body, regular and moderately coarse frontal sculpture on Sibuyan and Romblon (**A**, apparently identical

to *H. i. edai* OHM.); the latter then expanded to Luzon, differentiated (cupreous-bronzed colouration, basally straight pronotal sides) into *H. incertus* sp. n., and spread to the north (Babuyan), southeast (Leyte) and back to Romblon (one specimen known) where it became sympatric with its “mother” [*H. i. edai* OHM.] what (if confirmed – only one specimen known from there as yet) testifies to the specific distinctness.

While the nominotypical subgenus colonized Malay and Philippine Archipelagoes, some populations of the proto-*Haplotrinchus* crossed the LYDEKKER’S Line, and evolved into markedly differentiated (smaller but more robust body, front only anteriorly depressed, less pronounced dimorphism in vertex width, broad and definitely dfp lateral depressions, shorter lateral carina, extensively dfp elytral patches, deeply incised anterior margin of prosternum, sulcate metasternum, contrastingly dfp lateral patches on sternites) *Transwallacea* sg. n. (5:CT). The relationships within this group, as emerging from the following phylogenetic reconstruction [which, however, includes only 4 out of 7 or – if *H. aurocupreus* (KERR.) belongs here – 8 known species, and so cannot be treated as anything more than a preliminary approximation] show a very interesting biogeographical pattern of frontoactive (HOLYŃSKI 2009b) [=“centripetal”] evolution: the sequence of distribution areas [W. New Guinea – E. New Guinea – Solomons – New Hebrides] of the involved species exactly reflects the sequence of their successive branching off in the cladogram [*H. connectens* sp. n. – *H. embrikiellus* OBB. – *H. amicorum* sp. n. – *H. marginefossa* (THS.)]; it would be very interesting to know if the Fidjian species [*H. pyrochlorus* (FRM.), *H. manni* THY.] and *H. pooli* THY. [described from “*Océanie et probablement Iles Fidji*”] do also conform to this trend? The morphological evolution shows less regularity, with several reversals and parallelisms (“underlying synapomorphies”?). In *H. connectens* sp. n. frontal sculpture became fine, pronotal sides basally rounded, elytral interstriae nearly flat; its distinctive (blackish – slightly but discernibly different between pronotum and elytra – colouration, pronotal sides convergent from *ca.* basal third, not distinctly transverse scutellum, epipleura vanishing far before apex, carinately elevated apical margin of prosternum) “sister” (QQ) evolved (somewhat larger size, shallower emargination of prosternal apical margin, regularly convex 1. sternite) in New Guinea into *H. embrikiellus* OBB., simultaneously expanding to Solomon Is. where the eastern populations developed the characteristics of PP (testaceous tarsi, frontal depression extending to vertex, oblique frontal ridges slightly developed, median line of pronotum undifferentiated). And again, PP spread to the south-east and while further divergent evolution of “resident” Solomonese population led to *H. amicorum* sp. n. [reversals to unicolorous dorsal side (except dfp spots), to parallelsided basal half of pronotum, and to undifferentiated apical margin of prosternum; distinct transverse ridge on front, simple (without bordering stria or furrow) lateral rim of prosternal process, broadly depressed metasternum], the “colonizers” on New Hebrides markedly changed in other directions (bronzed – contrasting with elytra – pronotum, fine frontal sculpture without oblique ridges, lateral carina of pronotum reaching only to *ca.* midlength, flat elytral interstriae, slender 1. metatarsomere) to become *H. marginefossa* (THS.). Here, unfortunately, ends the story, because Fidjian species [*H. pyrochlorus* (FRM.), *H. manni* THY., ?*H. pooli* THY.] have not been available for the present study.

As mentioned above, unexpectedly to me my phylogenetic reconstructions tend to favour BÍLÝ & al.'s (2009) concept of "**Poecilonotini** JAK. *sensu novo*" rather than that of **Haplotrinchina** HOL. as advocated by me (HOLYŃSKI 1993): none of the particular "sub-analyses" (1. – 5.) showed *Melobasina* KERR. as a sister-group of *Haplotrinchus* KERR. or (*Haplotrinchus* KERR. + *Cardiaspis* SND.). These results remain rather ambiguous [the congruence between the respective parts of resulting cladograms, as well as the degree of support (SQ) for the critical pairings, were poor] and cannot be accepted as the final solution without confirmation by independent (based on different character- and/or denser taxon-sampling) studies; especially desirable would be the inclusion of *Rhabdolona* OBB. and *Haplotrinchus* [?] *splendens* WATH., but *H. aurocupreus* (KERR.) on the one hand and representatives of such groups – possibly related either to one or both the "target" genera or to *Ovalisia* KERR., whose apparent "sister"-relation to *Melobasina* KERR. might easily be an effect of something like "long branch attraction" (no closer relative having been "available" in the analysis...) – as the **Sphenopterina** LAC., **Kisanthobiina** RICHT. or **Bubastina** OBB. Nevertheless, now we must tentatively accept the situation as is emerged from the reconstructions and treat *Melobasina* KERR. as a clade unrelated to that consisting of *Haplotrinchus* KERR. and *Cardiaspis* SND.

Our "final" cladogram shows the ancestors of both clades (**III** and **BBB**) as separated by four nodes (**[X]**, **JJJ**, **FFF**, and **CCC**) involving, respectively, *Psiloptera* DEJ., *Dicerca* ESCH., *Poecilonota* ESCH., and *Ovalisia* KERR.; the relationships among and within these taxa remain out of the scope of the present study (they have been treated in my earlier papers: HOLYŃSKI 1999, 2000, 2005, 2011), so now I leave them out of consideration and start the analysis of the *Melobasina* KERR. clade from its basal node (**BBB**). That "proto-*Melobasina*" was a small (<15 mm.), robust (L:W<3), cupreous-bronzed, dorsally glabrous beetle with dark tarsi and metallic undifferentiated labrum, simple (not carinate) cheeks, closed antennal cavities, irregular and moderately coarse sculpture of anteriorly depressed front, short supraantennal carinae, no oblique but distinct transverse frontal ridge, moderately wide (VW:HW≈0.4-0.5 in both sexes) vertex, pronotal sides straight and parallel in basal half, deep prebasal but no lateral depressions, undifferentiated median line, lateral carina extending beyond midlength, small transverse scutellum, caudate elytra with denticulate lateroposterior margins and tridentate apices, internal striae consisting of rows of moderately coarse separate punctures, interstriae flat, no elytral dfp patches, epipleura with distinct mesepimeral denticle, abruptly vanishing behind metacoxae, emarginate apical margin of prosternum, prosternal process impunctate between distinct lateral striae, no pro-mesosternal ledge, normally developed mesepisterna, mesosternum fully divided by sternal cavity, flat metasternum, metepisterna and 1. sternite, no metacoxal denticle, no lateroapical lobes, no lateral reliefs or dfp patches on sternites, distinct marginal groove, undifferentiated mandibles, antennae rather short with 3. joint subequal to 4., 1. metatarsomere robust, not much longer than 2., anal sternite not carinate medially, with distinct apical blade, bidentulate apex slightly dimorphous sexually. Where had it lived is not easy to say: all recent representatives of one of its descendant clades (**U**: the subgenus *Nesotrinchus* OBB.) inhabit Fiji, Tonga, and perhaps – if the enigmatic "*Buprestis wallisii* MTR." is not in fact accidentally introduced *M. (N.) thomsoni* B.K.V. – Wallis Is. at the remotest

south-east of the genus distribution area, but none of the other two subgenera (*Ulaikoilia* B.K.V. and *Melobasina* KERR. s. str.), nor any of the nearest outgroups (*Ovalisia* KERR., *Poecilonota* ESCH., *Dicerca* ESCH.) extends beyond Solomons, so it seems justified to locate the cradle of *Melobasina* KERR. somewhere near the northwestern borderland of its present distribution area, perhaps on those terranes of the Tertiary Melanesian Arc which ultimately became parts of New Guinea and Moluques.

As mentioned above, the subgenus *Nesotrinchus* OBB. seems to be endemic to Fiji and Tonga Is. [*M. (N.) australica* (KERR.) has been originally described from “Australia”, but this – as justly observed by BÍLÝ & al. (2009) – “*is most probably an error*”: otherwise the species is known only from Fiji]. Brownish labrum, anteriorly depressed front with distinct oblique ridges, pronotal sides convergent from base, deep lateral depressions, strikingly swollen lateral carina, strongly caudate elytra, contrasting lateral dfp patches on sternites, and pronouncedly dimorphic apex of anal sternite made the (probably Fijian) ancestor (**U**) markedly different from **BBB**. One of its “daughters” is *M. (N.) australica* (KERR.), a blackish to definitely black species with no distinct prebasal depressions on pronotum; in the other, **M**, elytra became purplish (contrasting with cupreous-bronzed pronotum), supraantennal carinae prolonged upwards, sides of pronotum basally rounded, and scutellum not distinctly transverse. This species colonized Tonga Is., where it remained practically unchanged (only 1. sternite became regularly convex) as *M. (N.) caeruleipennis* (FRM.), while in the Fijian populations transverse ridge of front disappeared, frontal sculpture became fine, prebasal depressions on pronotum shallow, elytral striae disintegrated into puncture rows, and abdominal dfp patches inconspicuous – the result is the recent *M. (N.) thomsoni* (B.K.V.).

The “sister” clade of sg. *Nesotrinchus* OBB. [**U**] is **SS** (VW:HW>0.5, pronotal sides shallowly sinuate before base), the ancestor (living probably on what is now northern New Guinea) of the remaining two subgenera. Less differentiated (length to width of body above 3.0, elytra not concolorous with pronotum, scutellum not distinctly transverse, apex of anal sternite carinately bispinose) of its two descendants is the ancestor (**AA**) of *Melobasina* KERR. s. str., while in the other, sg. *Ulaikoilia* B.K.V. (represented in the analysis only with *M. (U.) hoschecki* sp. n. – I have not seen *M. (U.) jelineki* B.K.V. in nature), body became more robust (L:W<2.7), green, no transverse ridge on front, pronotal sides basally straight (in the analyzed species – not yet in the ancestor of both!), lateral carina shorter, lateroapical margin of elytra finely serrate, epipleura abruptly subangularly disappearing behind metacoxae, prosternal process sparsely punctured, 1. sternite regularly convex. **AA** expanded to Moluques, where series of morphological modifications (purplish-violaceous elytra contrasting with golden-green pronotum, coarse frontal sculpture, prolonged supraantennal carinae, narrower vertex, pronotal sides deeply sinuate before base, prebasal depressions shallow, elytral striae continuous, interstriae convex) transformed it into *M. (s. str.) suturalis* (DEYR.), while the New Guinean population (KUBÁŇ & BÍLÝ 2010) became *M. (s. str.) riedeli* K.B. [not seen by me and not included in the analysis], and the easternmost outposts reached Solomons and become **T** (regular frontal sculpture, marked sexual dimorphism in apex of anal sternite). This clade consists of 5 named forms of uncertain taxonomic validity (variously synonymized on rather spurious grounds, but – pending the reliable eviden-

ce to the contrary – I prefer to treat them tentatively as separate species), all endemic to the Louisiade [*M.* (s. str.) *apicalis* KERR.] and Solomon Archipelagoes, all known from single localities [indeed, only from one to three specimens each], although the two examples determined by LEVEY as *M. fossicollis* (KERR.) but mentioned by BÍLÝ & al. (2009) as additional material of *M. apicalis* KERR., belong almost certainly to *M.* (s. str.) *chrysocyanea* sp. n., what would increase the number of known localities to two (both on the same island)]; in such situation, and as only 3 of these species have been available for study, the detailed discussion of the branching sequence, distributional history, or morphological evolution would anyway remain in the realm of “scientific poetry”; suffice it to say that their distribution is strictly allopatric: no island is known to be inhabited by more than one species: *M. apicalis* KERR. on Tugela, *M. ignita* (THY.) on Bougainville, *M. fossicollis* (KERR.) on Tulagi, *M. solomonensis* (THY.) on Malaita and *M. chrysocyanea* sp. n. on Guadalcanal.

ACKNOWLEDGEMENTS

I am greatly indebted to Charles L. BELLAMY, Ulf NYLANDER, Thierry Neef de SAINVAL, as well as to the authorities of the Bernice P. Bishop Museum (Honolulu), Koninklijk Belgisch Instituut voor Natuurwetenschappen (Brussels), Museum National d’Histoire Naturelle (Paris) and Raffles Museum of Biodiversity Research (Singapore) for loan of material; to C.L. BELLAMY also for various explanations and pictures; to Svatopluk BÍLÝ and Vitězskáv KUBÁŇ for information on, and photograph of, the Basel “type” of “*Haplotrinchus titschacki* HOSCH.”; and to Piotr ŚLIPIŃSKI for making pictures for this paper.

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Appendix 1

DEFINITIONS OF TRAITS AND COSTS OF TRANSFORMATION

Upper line – codes of traits [=character-states]; [***bold italics***] – terminal auto-morphies;

Lower line – weights (costs of transformation) [$0 \leftrightarrow 1 \leftrightarrow 2 = 2$: additively equidistant (distance between 0 and 1 the same (=2) as between 1 to 2, that between 0 and 2 = 2+2 = 4; (abc) \leftrightarrow (de)=1: equidistant between groups (a \leftrightarrow d=a \leftrightarrow e=b \leftrightarrow d=b \leftrightarrow e=c \leftrightarrow d=c \leftrightarrow e=1); (bcd) = 1: equidistant within group (b \leftrightarrow c = c \leftrightarrow d = b \leftrightarrow d = 1)].

1. Body length (average) – [***0***] <10; [1] 10-15; [2] 15-25; [***3***] >25
 $0 \leftrightarrow 1 \leftrightarrow 2 \leftrightarrow 3 = 1$
2. Body proportions (L:W) – [***0***] <2.4; [1] 2.4-2.7; [2] 2.7-3.0; [3] >3.0-3.3; [***4***] >3.3
 $0 \leftrightarrow 1 \leftrightarrow 2 \leftrightarrow 3 \leftrightarrow 4 = 1$
3. Colour (labrum) – [***0***] metallic; [***1***] brownish to yellow;
 $0 \leftrightarrow 1 = 2$
4. Colour (tarsi) – [***0***] metallic or blackish; [***1***] testaceous;
 $0 \leftrightarrow 1 = 3$
5. Colour (yellow or red areas) – [***0***] absent; [1] small; [***2***] extensive (>half of surface);
 $0 \leftrightarrow 1 = 3$; $1 \leftrightarrow 2 = 1$
6. Colour (dark areas on pronotal disk) – [***a***] black; [***b***] bronzed; [c] cupreous; [d] green to bluish; [***e***] violaceous to purplish;
 $a \leftrightarrow (bcde) = 1$; $b \leftrightarrow c \leftrightarrow d \leftrightarrow e = 1$
7. Colour (pronotal sides) – [***0***] concolorous; [***1***] contrasting;
 $0 \leftrightarrow 1 = 2$
8. Colour (elytral base) – [***0***] concolorous; [1] distinctly different; [***2***] contrasting;
 $0 \leftrightarrow 1 \leftrightarrow 2 = 1$
9. Colour (elytral apical half) – [***0***] concolorous with base; [***1***] distinctly different
 $0 \leftrightarrow 1 = 1$
10. Spots – [***a***] dark colour; [***k***] pubescent dfp; [***m***] interstitial reliefs; [***h***] none
 $(akm) = 3$; $(akm) \leftrightarrow h = 2$;
11. Pubescence (dorsal) – [***p***] Erialata-type; [***a***] inconspicuous; [k] distinct, short; [***d***] long
 $p \leftrightarrow (ak) = 2$; $p \leftrightarrow d = 3$; $a \leftrightarrow k = 1$; $k \leftrightarrow d = 2$
12. Labrum structure – [***0***] simple; [***1***] semicircular, transversely carinate
 $0 \leftrightarrow 1 = 3$
13. Cheeks beneath eyes – [***0***] undifferentiated; [***1***] carinately produced
 $0 \leftrightarrow 1 = 3$
14. Antennal cavities – [***0***] open; [***1***] closed
 $0 \leftrightarrow 1 = 3$

15. Front: surface – **[0]** flat or convex; [1] deeply depressed anteriorly; **[2]** deeply depressed throughout
 $0 \leftrightarrow 1 \leftrightarrow 2 = 1$
16. Front: sculpture – **[0]** fine; [1] moderate; **[2]** coarse
 $0 \leftrightarrow 1 \leftrightarrow 2 = 1$
17. Front: sculpture – **[0]** regular; **[1]** markedly irregular
 $0 \leftrightarrow 1 = 1$
18. Front: supraantennal carinae – **[0]** none or short; [1] slightly prolonged upwards; **[2]** strikingly prolonged upwards
 $0 \leftrightarrow 1 \leftrightarrow 2 = 1$
19. Front: oblique longitudinal ridges – **[0]** none; [1] slight; **[2]** prominent
 $0 \leftrightarrow 1 = 1; 1 \leftrightarrow 2 = 2$
20. Front: transverse ridge – **[0]** none; **[1]** distinct
 $0 \leftrightarrow 1 = 1$
21. Vertex width (V:H – female) – **[0]** <0.3; [1] 0.3-0.4; [2] 0.4-0.5; [3] 0.5-0.6; **[4]** >0.6
 $0 \leftrightarrow 1 \leftrightarrow 2 \leftrightarrow 3 \leftrightarrow 4 = 1$
22. Vertex width (sexual dimorphism) – **[0]** none or inconspicuous; **[1]** prominent
 $0 \leftrightarrow 1 = 2$
23. Pronotum: proportions (MW:BW): **[0]** <0.95; (1) 0.95-1.05; **[2]** >1.05
 $0 \leftrightarrow 1 \leftrightarrow 2 = 1$
24. Pronotum: sides basally – **[0]** deeply sinuate; [1] shallowly sinuate; [2] straight; **[3]** rounded
 $0 \leftrightarrow 1 \leftrightarrow 2 \leftrightarrow 3 = 1$
25. Pronotum: prebasal depressions – **[0]** none or indistinct; [1] shallow; **[2]** deep
 $0 \leftrightarrow 1 = 2; 1 \leftrightarrow 2 = 1$
26. Pronotum: lateral depressions – **[0]** none or indistinct; [1] shallow; [2] deep; **[3]** broadly dfp
 $0 \leftrightarrow 1 \leftrightarrow 2 \leftrightarrow 3 = 1$
27. Pronotum: median line – **[0]** sulcate; [1] undifferentiated; **[2]** carinate
 $0 \leftrightarrow 1 \leftrightarrow 2 = 1$
28. Pronotum: lateral carina (regular to) – **[a]** <<midlength; [b] ca. midlength; [c] >>midlength; **[d]** ≈entire; **[x]** strikingly swollen throughout
 $a \leftrightarrow b \leftrightarrow c \leftrightarrow d = 1; (ad) \leftrightarrow x = 1$
29. Scutellum: proportions – **[a]** small, not distinctly transverse; **[b]** small, transverse; **[x]** large
 $a \leftrightarrow b = 2; (ab) \leftrightarrow x = 3$
30. Elytra: base – **[0]** normal; **[1]** lamellarly produced anterad
 $0 \leftrightarrow 1 = 1$
31. Elytra: lateroapical margin (shape) – **[0]** cuneate; [1] slightly caudate (sides definitely convergent to apices); **[2]** strongly caudate (sides apically subparallelsided)
 $0 \leftrightarrow 1 = 1; 1 \leftrightarrow 2 = 2$

32. Elytra: lateroapical margin (structure) – **[0]** smooth; **[1]** finely serrate; **[2]** coarsely denticulate
 $0 \leftrightarrow 1 \leftrightarrow 2 = 2$
33. Elytra: apex – **[t]** tridentate; **[m]** multidenticulate; **[r]** narrowly rounded/truncated; **[b]** bidentate; **[u]** unidentate
 $t \leftrightarrow m = 2$; $m \leftrightarrow r = 1$; $(trm) \leftrightarrow bu = 2$; $b \leftrightarrow u = 1$
34. Elytra: striae [inner] structure – **[0]** none or puncture rows; **[1]** continuous
 $0 \leftrightarrow 1 = 1$
35. Elytra: punctures in striae – **[0]** none or very fine; **[1]** moderately fine; **[2]** coarse
 $0 \leftrightarrow 1 \leftrightarrow 2 = 1$
36. Elytral interstriae – elevation: **[0]** equal; **[1]** alternately unequal
 $0 \leftrightarrow 1 = 2$
37. Elytral inner intercostate interstriae – convexity: **[0]** flat/depressed; **[1]** convex
 $0 \leftrightarrow 1 = 1$
38. Elytra: [background-]sculpture – **[0]** [rugoso-]punctate; **[1]** granulate
 $0 \leftrightarrow 1 = 2$
39. Elytral dfp – type: **[a]** none or indefinite; **[b]** interstitial foveae; **[c]** small “punctiform” spots; **[p]** extensive patches
 $(abc) = 2$; $(ac) \leftrightarrow p = 2$; $b \leftrightarrow p = 3$
40. Epipleura: basal (mesepimeral) denticle – **[0]** none; **[1]** distinct
 $0 \leftrightarrow 1 = 4$
41. Epipleura: length – **[0]** reaching to [near] apex; **[1]** narrow, gradually disappearing behind metacoxae; **[2]** narrow, abruptly disappearing at metacoxae; **[3]** broad, subangularly disappearing at metacoxae
 $0 \leftrightarrow 1 \leftrightarrow 2 \leftrightarrow 3 = 1$
42. Prosternal apex – **[0]** [almost] straight or convex; **[1]** definitely emarginate; **[2]** deeply incised
 $0 \leftrightarrow 1 \leftrightarrow 2 = 1$
43. Prosternal apical margin – **[a]** undifferentiated; **[s]** swollen; **[c]** carinately elevated
 $(asc) = 2$
44. Prosternal process sculpture medially (♀) – **[0]** smooth; **[1]** sparsely punctured; **[2]** densely punctured
 $0 \leftrightarrow 1 \leftrightarrow 2 = 1$
45. Prosternal process: border structure – **[a]** none or indistinct; **[x]** lateral rim; **[b]** furrow; **[c]** stria
 $a \leftrightarrow x \leftrightarrow (bc) = 2$; $b \leftrightarrow c = 1$
46. Pro-mesosternal ledge: **[0]** none; **[1]** indistinct; **[2]** conspicuous
 $0 \leftrightarrow 1 \leftrightarrow 2 = 2$
47. Mesepisterna: **[0]** reaching to or near epipleura; **[1]** not extending beyond *ca.* $\frac{2}{3}$ of the distance
 $0 \leftrightarrow 1 = 4$

48. Mesosternum: **[0]** fully divided by sternal cavity; **[1]** halves touching posteriorly
0↔1=3
49. Metasternum: **[a]** flat; **[b]** broadly depressed; **[c]** deeply sulcate
(abc)=1
50. Metepisterna: **[0]** flat or convex; **[1]** longitudinally depressed
0↔1=2
51. Metacoxal denticle: **[0]** none or broadly obliterated; [1] distinct but obtuse; **[2]** well marked, sharp, right-angled
0↔1↔2=2
52. 1. sternite [♀] – **[0]** regularly convex; [1] flat/inconspicuously depressed; **[2]** deeply depressed or sulcate
0↔1=1; 1↔2=2
53. 2.-4. sternites: lateroapical lobes – **[0]** none or minute; **[1]** broad and prominent
0↔1=3
54. Abdomen: lateral groove – **[0]** none or indistinct; **[1]** deep, prominent
0↔1=2
55. Abdomen: lateral reliefs – **[0]** none; [1] irregular; **[2]** prominent, regular
0↔1↔2=1
56. Abdomen: lateral dfp patches – **[0]** none; [1] indefinite; **[2]** contrasting
0↔1↔2=1
57. Mandible – **[0]** laterally rounded; **[1]** laterally blade-like expanded
0↔1=3
58. Antennae: width – **[0]** long, slender; [1] short, compact; **[2]** strikingly widened
0↔1=1; 1↔2=2
59. Antennae: 3. joint – **[0]** ≈ 2.; **[1]** ≈ 4.
0↔1=2
60. 1. metatarsomere (female): proportions – **[0]** robust, L:W<3; **[1]** slender, L:W≈4
0↔1=2
61. 1. metatarsomere: relative length – **[0]** ≈ 2.; **[1]** ≈ 2.+3.
0↔1=2
62. Anal sternite: median carina – **[0]** none; [1] inconspicuous; **[2]** prominent, sharp
0↔1↔2=2
63. Anal sternite: apical blade – **[0]** none or indistinct; **[1]** conspicuous
0↔1=2
64. Anal sternite (male): apex – **[0]** rounded or truncated; [1] emarginate; [2] bidenticulate; **[3]** carinately bispinose
0↔1↔2↔3=1
65. Anal sternite (female): apex – **[0]** like in male; [1] slightly different; **[2]** strikingly different
0↔1↔2=1

Appendix 2

FINAL CHARACTER-MATRIX

Terminal taxa of generic/subgeneric rank represented by:

Buprestis (Eurythyrea) eoa (SEM.)
Buprestis (Yamina) sanguinea (F.)
Hyperantha (Hyperanthodes) haemorrhoea FRM.
Calodema regalis (C.G.)
Melobasis (s. str.) *trifasciata* (C.G.)
Melobasis (Diceropygus) oleomaculata (OBB.)
Hilarotes nitidicollis (C.G.)
Philanthaxia composite
Ovalisia (Poecilisia) composite
Ovalisia (Cinyrisia) sexspinosa (THS.)
Ovalisia (Mabomisia) composite
Ovalisia (Erialata) pubescens (FISH.)
Ovalisia (Zykovisia) jacobsoni (OBB.)
Ovalisia (s. str.) *purpuricollis* (HOSCH.)
Ovalisia (Palmar) composite
Ovalisia (Scintillatrix) composite
Poecilonota 2:QQ
Dicerca 3:X
Psiloptera (Spinthoptera) orientalis (C.G.)
Euplectalecia pulverulenta (SND.)
Chrysesthes tripunctata (F.)
Eupodalecia perfecta (KERR.)
Panapulla strongyliformis NELS.

[“composite” – presumably plesiomorphous character-states selected;
 “2:QQ” and “3:X” – respective reconstructed ancestors from HOLYŃSKI 2011]

	1		2		3		4		5		6		
	12345	67890	12345	67890	12345	67890	12345	67890	12345	67890	12345	67890	
BYA B. (Yamina)	21101	a110h	a0001	10000	30130	01da0	00u10	010a0	20c1a	000c0	02000	00110	10011=13
BEU B. (Eurythyrea)	22100	d000h	a0000	10000	30130	01db0	00u11	000a0	20c1a	000c0	00000	00110	10020= 4
Pbl P. bloetei	32102	a120h	a0000	10000	20030	01xx1	20b10	010a0	20s1a	010c0	00000	00111	10021= 0
Pju P. jucunda	32101	a120h	a0000	00000	20030	01xx1	20b10	000a0	20s1a	010c0	00000	00111	10021= 1
Ptf P. trifasciata	32101	a120h	a0000	10000	20030	01xx1	20b10	000a0	20s1a	010c0	00000	00111	10021= 0
HYP Hyperantha	32102	a120h	a0002	10000	20130	01xx1	00m10	010a0	20s1a	010a0	00000	00110	10020= 8
CAL Calodema	31102	d020h	a0000	10010	10130	01da1	00b01	000a0	20s0a	010a0	00000	01111	10012=13
Pst P. subtilis	03100	d000h	a0111	10000	30120	01aa0	00b00	000a1	00c1c	001c1	00100	00010	10121=14
Pin P. insolita	14000	e100k	a0111	10000	30120	01aa0	01b11	000c1	00s1a	001a1	01100	20010	10100= 7
Plz P. luzonica	14000	d000k	a0111	10000	30120	01aa0	00b11	000c1	00a1a	001a1	00100	20010	10100= 1
Ptr P. tricolor	04100	e120k	a0111	10000	40120	11aa0	10b01	000c1	00a1a	001a1	00100	20010	10100= 4
Pmm P. matrisemeae	14100	d020k	a0111	10000	30120	01ba0	20b12	010c1	00c1a	001a1	00100	20010	10011=11
Pmj P. major	14000	c020h	a0111	10000	30010	01aa0	10b01	000a1	00a1a	001a1	00100	00010	10120= 4
Sar S. archboldi	14000	d000h	a0111	10000	30010	00xa0	00b01	000a1	01a1a	000c0	00100	20010	10121= 8
Ppu P. purpurea	03100	c120h	a0000	10000	30120	01ca0	10b01	000a1	00a1a	001a0	00000	00011	11000=11
Ebm E. bellamyi	14000	b000h	k0100	10000	40110	00ca0	10b10	000a1	00s1a	000a0	00000	00010	10121= 4
Ehr E. brunneus	14000	b000h	k0101	10000	40110	00ba0	00b10	000a1	00a1a	000a0	00000	00010	10121= 4
Est E. strandi	14000	b000h	k0101	10000	40010	00ba0	10b10	000a1	00a1a	000a0	00000	00011	10121= 0
Eap E. apicepubens	14000	b000h	k0100	10000	40020	00ba0	10b10	000a1	00s1a	000c0	00000	00011	10121= 4
Ema E. malayanus	14100	b000h	k0000	20000	40010	01ba0	00b11	000a1	10a1c	000a0	00000	00010	10121=10
Eig E. igniceps	14100	b000h	k0000	10000	40020	00ba0	10b11	000a1	00a2a	000b0	00000	00011	10131= 9
Cel C. elongata	24100	a000h	a0000	21000	10120	20ca0	00b11	110a1	00a1a	001c0	00000	00010	10120=12
Csp C. sp.	14100	a000h	a0000	00000	20010	20ba0	00b10	000a1	00a1a	001a0	00000	00010	10120= 1
MBM M. (Melobasis)	00000	d000a	a0000	00000	40210	11da0	02m00	000a1	20s2a	000a0	00000	00011	10121=16
MBD M. (Diceropygus)	13000	b000h	a0000	00000	30010	01bx0	02m11	010a1	20s2a	000a0	00000	00011	10121= 3
Ate A. tereticollis	23000	d000h	a0000	21000	10020	01ba0	10b00	000a1	00s1a	000a0	02010	01011	10111= 8
HLL Hilarotes	21000	d000h	a0000	21000	20120	20ca0	00b12	010a1	00c1a	000c1	22011	00010	10120=14
Sgr S. gracilipes	14000	b000m	a0000	10000	20120	20ca0	00b01	100b1	00c2a	000b0	01000	00011	10120= 7
Spf S. parafrontalis	24000	b000m	a0000	21100	20120	00ca0	00b11	100b1	00c0c	000c0	02001	00111	10120=12
Scf S. costulifera	24000	b000k	a0000	10000	10010	20da0	10b10	110c1	00c1c	000c0	12001	20011	10120= 6
Smp S. multipunctata	14000	b000k	a0000	00000	20020	20da0	10b11	010c1	00c1c	000b0	10000	20011	10120= 5
Cvp C. viridipunctata	24000	d000k	a0000	20000	10020	20db0	10b00	100c1	00a1a	100a1	01002	20011	10130= 9
Csf C. sulcifera	24000	d000k	a0000	21000	11020	20db0	10b01	100c1	00a1c	100b1	02002	10011	10130= 3
Cmo C. mouhoti	32000	d000h	a0012	11120	01030	11dx0	20t10	010a1	02a1x	200c0	01010	10010	12121= 6
Cpi C. pisciformis	22000	d000h	a0012	11120	01130	10dx0	20t11	010a1	02a1b	200c0	02010	20010	12121= 2
Cha C. babaulti	22000	d010h	a0012	01120	01130	10dx0	20t11	010a1	02a1c	200c0	01010	20010	12121= 4
Hse H. semperi	22000	d000h	a0012	00120	01121	20db0	20t11	010a1	01a1x	000c1	00110	00001	10121= 1
Hap H. amplius	22000	d000h	a0012	10120	01032	20db0	20t11	010a1	01a1x	000c1	00110	10001	10121= 1
Hva H. viridula	22000	d000h	a0012	00120	01032	21db0	20t11	010a1	01a1x	000a1	01110	10001	10121= 3
Hvs H. viridis	22000	d000h	a0011	10120	01122	21db0	20t11	010a1	01a1b	000a1	00110	10010	10121= 2
Hbo H. borneanus	11000	b000h	a0011	10120	01121	20da0	20t11	000a1	01a1b	000a1	01110	10010	10121= 3
Hdj H. incertus	11000	c000h	a0012	10120	01121	20db0	20t11	000a1	02a1b	000c1	01110	10010	10121= 2
Hed H. edai	11000	d000h	a0012	10120	01131	20db0	20t11	000a1	02a1b	000c1	01110	10010	10121= 0
Hin H. inaequalis	21000	d000h	a0012	21120	01131	20db0	20t11	000a1	02a1b	000c1	01110	10010	10121= 0
Hpn H. pyrthonotus	21000	c000h	a0012	21120	01131	20db0	20t11	000a1	02a1b	000c1	01110	10010	10121= 1
Hne H. i. negrophilus	21000	a001h	a0011	21120	01131	20da0	20t11	000a1	02a1b	000c1	01110	10010	10121= 2
Hct H. connectens	11000	d000h	a0011	00120	00130	30cb0	20t11	000p1	02a1b	000c1	02110	20010	10121= 3
Hem H. embrikiellus	21000	a010h	a0011	10120	00020	30ca0	20t11	010p1	12c1b	000c1	00110	20010	10121= 5
Ham H. amicorum	11010	a100h	a0012	10111	00020	31ca0	20t11	010p1	12a2x	000b1	02110	20010	10121= 8
Hma H. marginifossa	11010	b020h	a0012	00100	00020	31ba0	20t11	000p1	12c1b	000c1	02110	20011	10121= 9
Mau M. australica	12100	a000h	a0011	11011	20020	21xb0	22t01	000a1	21a0c	000a0	01010	20110	00122= 3
Mth M. thomsoni	12100	c001h	a0011	01110	20031	21xa0	22t01	000a1	21a0c	000a0	01010	10110	00122= 5
Mcp M. caeruleipennis	12100	c001h	a0011	11111	20032	21xa0	22t11	000a1	21a0c	000a0	001010	20110	00122= 1
Map M. apicalis	12000	c011h	a0010	10001	30122	01ca0	02t01	000a1	20a0c	000a0	01010	00110	00132= 2
Mfs M. fassicollis	12000	d011h	a0010	10001	30112	01ca0	12t02	000a1	21a0c	000a0	01010	00110	00132= 2
Mcc M. chrysocyanea	13000	c020h	a0010	00000	30112	01ca0	12t01	000a1	21a0c	000c0	01010	00111	00132= 6
Msu M. suturalis	13000	e110h	a0010	21101	20101	01ca0	12t11	010a1	21a0c	000a0	01010	00110	00131=11
Mhs M. hoschecki	11000	d000h	a0010	21000	30122	01bb0	11t01	000a1	31a1c	000a0	00010	00110	00121=11
OPL O. (Poecilisia)	13000	b000m	d0010	10101	20011	02cb0	11t10	000a1	01a2c	000a0	00011	00110	00022= 8
OCN O. (Cinyrisia)	12000	b000m	a0011	10201	20111	02ca0	01t11	000a1	21a2a	000a0	00010	00100	00031= 1
OMB O. (Mabomsia)	12000	b000a	k0011	11200	10121	01ca0	11t11	000a1	21a1c	000a0	01010	00100	00022= 4
OER O. (Erialata)	12000	b000a	p0011	11100	10101	01ca0	01t10	000a1	20a2x	000a0	00010	00200	00121=14
OOV O. (Ovalisia)	01000	a110a	a1111	10110	20130	01cb0	11r10	001a1	30s1a	000a0	01010	01100	00020=20
OZY O. (Zykovisia)	01000	c000a	a1111	10100	20220	01ca0	01r10	001a1	20s2a	000b0	00010	01100	10121= 1
OPM O. (Palmar)	12000	d000a	a0010	21100	20121	01ca0	01r11	000a1	20s2b	000b0	00010	00110	10121= 3
OSC O. (Scintillatrix)	12000	d000m	a0010	10001	20131	02cb0	01m10	000a1	20a1b	000a0	10010	00110	10021= 6
PCN Poecilionota	11000	a000m	a0010	10001	20120	02db0	11r10	010p1	10a2c	000c0	01000	00010	01012=11
DC Dicerca	22000	c000m	a0010	20000	30120	01aa0	11b11	000p1	00a1c	000b1	12011	00010	00022=15
PSI Psiloptera	22000	b020k	a0000	11000	20100	00da0	10b11	110b1	00s0c	000c0	11010	00110	00000=20
EPL Euplectalecia	22100	b000h	a0002	20100	20021	00aa0	00u12	010a1	00a1a	000c1	00001	00010	10001=12
EPO Eupodalecia	13100	e000k	a0002	20100	00022	00ca0	02r11	110c1	10s1a	000c0	00000	20010	10120=14
CHR Chrysesthes	23100	d000k	a0002	20200	00020	01ca0	02u11	010c1	20a1a	200c0	00010	00110	10021=11

SUBTRIBES PHRIXIINA AND HAPLOTINCHINA

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A	11000	d000h	a0012	10120	01131	20db0	20t11	000a1	02alb	000c1	01110	10010	10121=	3	[2/ 3]
B	32101	a120h	a0000	10000	20030	01xx1	20b10	000a0	20s1a	010c0	00000	00111	10021=	2	[2/ 3]
C	32102	a120h	a0000	10000	20030	01xx1	20b10	010a0	20s1a	010c0	00000	00111	10021=	5	[3/12]
F	22000	d000h	a0012	00120	01032	20db0	20t11	010a1	01alx	000c1	00110	10001	10121=	3	[4/ 5]
G	14000	b000h	k0101	10000	40010	00ba0	10b10	000a1	00a1a	000a0	00000	00011	10121=	1	[4/ 5]
H	22000	d000h	a0012	00120	01121	20db0	20t11	010a1	01alx	000c1	00110	10001	10121=	7	[5/11]
I	12000	c011h	a0010	10001	30112	01ca0	12t01	000a1	21a0c	000a0	01010	00110	00132=	2	[5/11]
K	14000	b000h	k0100	10000	40010	00ba0	10b10	000a1	00s1a	000a0	00000	00011	10121=	0	[5/ 6]
L	14000	b000h	k0000	10000	40010	00ba0	10b10	000a1	00s1a	000a0	00000	00011	10121=	4	[6/16]
M	12100	c001h	a0011	11111	20032	21xa0	22t01	000a1	21a0c	000a0	01010	20110	00122=	5	[6/11]
N	22000	d000h	a0012	11120	01130	10dx0	20t11	010a1	02alb	200c0	01010	20010	12121=	1	[6/ 9]
O	14000	e100k	a0111	10000	30120	01aa0	00b11	000c1	00a1a	001a1	00100	20010	10100=	5	[8/12]
Q	22000	d000h	a0012	11120	01130	10dx0	20t11	010a1	02alb	200c0	01010	10010	12121=	14	[9/32]
R	24000	d000k	a0000	20000	10020	20db0	10b01	100c1	00a1c	100b1	02002	10011	10101=	1	[10/23]
T	13000	c010h	a0010	10001	30112	01ca0	12t01	000a1	21a0c	000a0	01010	00110	00132=	2	[10/15]
U	12100	c000h	a0111	11011	20022	21xb0	22t01	000a1	21a0c	000a0	01010	20110	00122=	15	[11/29]
V	24000	b000k	a0000	10000	20020	20da0	10b11	110c1	00c1c	000b0	11001	20011	10120=	4	[12/21]
W	14100	e120k	a0111	10000	30120	01aa0	10b11	000c1	00a1a	001a1	00100	20010	10100=	2	[12/16]
X	14100	a000h	a0000	10000	20010	20ba0	00b10	000a1	00a1a	001a0	00000	00010	10120=	6	[13/18]
Y	12000	b000a	k0011	12200	10111	01ca0	01t11	000a1	21a1c	000a0	00010	00100	00021=	10	[13/16]
Z	32102	a120h	a0000	10000	20130	01xx1	00b10	010a0	20s1a	010a0	00000	00111	10021=	9	[14/25]
AA	13000	c010h	a0010	11001	30112	01ca0	12t01	000a1	21a0c	000a0	01010	00110	00131=	5	[15/21]
BB	24000	b000m	a0000	10000	20120	20ca0	00b11	100b1	00c1c	000b0	01001	00011	10120=	9	[16/21]
CC	12000	b000m	a0011	10201	20111	02ca0	01t11	000a1	21a2c	000a0	00010	00100	00021=	9	[16/18]
EE	12000	b000m	a0010	10101	20111	02cb0	01t10	000a1	21a2c	000a0	00011	00110	00022=	4	[17/21]
GG	22000	d000h	a0012	10120	01121	20db0	20t11	010a1	01alb	000c1	00110	10010	10121=	1	[10/17]
JJ	22100	d010h	a0000	10000	30130	01da0	00u11	010a0	20c1a	000c0	00000	00110	10020=	6	[18/31]
KK	13000	d000h	a0000	00000	30100	01ba0	02m11	010a1	20s2a	000a0	00000	00011	10121=	10	[19/30]
LL	01000	c000a	a0111	10100	20120	01ca0	01r10	001a1	20s2a	000b0	00010	01100	10121=	19	[18/24]
MM	12000	d000a	a0010	10100	20121	01ca0	01r10	000a1	20s2b	000b0	00010	00110	10121=	13	[19/25]
NN	12000	c000m	a0010	10101	20121	02cb0	01m10	000a1	20a2b	000a0	00010	00110	10021=	7	[18/21]
OO	14100	d120k	a0111	10000	30120	01aa0	00b11	000c1	00a1a	001a1	00100	20010	10110=	8	[19/22]
PP	11010	a010h	a0012	10110	00020	31ca0	20t11	010p1	12c1b	000c1	02110	20010	10121=	6	[13/17]
QQ	11000	a010h	a0011	10120	00020	30ca0	20t11	010p1	12c1b	000c1	02110	20010	10121=	8	[13/13]
RR	22000	d000h	a0012	10120	01120	20db0	20t11	010a1	01alb	000c1	00110	10010	10121=	9	[18/31]
SS	12000	c000h	a0010	10101	30112	01cb0	12t01	000a1	21a0c	000a0	01010	00110	00121=	2	[20/22]
UU	12000	c000m	a0010	10101	20121	02cb0	01t10	000a1	21a2c	000a0	00010	00110	00021=	3	[21/26]
VV	24000	b000k	a0000	10000	20020	20da0	10b11	100c1	00c1c	000b0	01001	10011	10120=	15	[21/25]
ZZ	32102	d020h	a0000	10000	20130	01da1	00b11	010a0	20s1a	010a0	00000	00111	10021=	13	[23/33]
AAA	22100	d020h	a0000	10000	30130	01da0	00b11	010a0	20s1a	000a0	00000	00111	10021=	10	[19/23]
BBB	12000	c000h	a0010	10101	20122	01cb0	12t01	000a1	21a0c	000a0	01010	00110	10121=	14	[21/24]
CCC	12000	c000m	a0010	10001	20121	02cb0	11t10	000a1	21a2c	000a0	01010	00110	00021=	9	[23/25]
DDD	23100	d000k	a0002	20001	00021	00ca0	02u11	010c1	10a1a	000c0	00000	00010	10021=	5	[23/32]
FFF	12000	c000m	a0010	10001	20120	02db0	11t10	000p1	10a2c	000c0	01010	00010	00022=	10	[24/30]
III	22000	d000h	a0012	10120	01120	10da0	20t11	010a1	01alb	000c0	01010	10010	10121=	20	[22/39]
JJJ	22000	c000m	a0010	10000	20120	01da0	11t11	000p1	00a1c	000c0	01010	00010	00022=	11	[26/30]
LLL	22100	d000h	a0002	20100	10021	00ca0	01u11	010a1	00a1a	000c0	00000	00010	10021		[27/30]
			k								1				
MMM	24000	d000k	a0000	20000	10020	20da0	10b01	100c1	00a1c	100b1	02001	10011	10120=	12	[24/25]
3-A	14000	d020h	a0111	10000	30010	01aa0	00b01	000a1	00a1a	001a1	00100	20010	10120=	4	[15/17]
3-B	14100	b000h	k0000	10000	40010	00ba0	10b11	000a1	00a1a	000a0	00000	00011	10121=	0	[15/16]
3-C	14100	b000h	k0000	10000	40010	00ba0	10b10	000a1	00a1a	000a0	00000	00011	10121=	6	[15/19]
3-D	14100	d020h	a0111	10000	30120	01aa0	00b01	000a1	00a1a	001a1	00100	20010	10120=	0	[17/17]
3-E	13100	d020h	a0111	10000	30120	01aa0	00b01	000a1	00a1a	001a1	00100	00010	10120=	16	[18/26]
3-F	14100	b000h	a0000	10000	30010	00ba0	00b10	000a1	00a1a	001a0	00000	00011	10120=	8	[18/19]
3-G	14100	c020h	a0000	10000	30120	01ba0	00b01	000a1	00a1a	001a0	00000	00011	10120=	1	[19/21]
4-B	14100	d020h	a0000	10000	30120	01ba0	00b01	000a1	00a1a	001a0	00000	00011	10020=	11	[22/23]
4-C	13100	d000h	a0000	10000	30120	01ba0	00b11	010a1	20s1a	000a0	00000	00011	10121=	3	[20/21]
4-D	13000	d000h	a0000	10000	30020	01ba0	00b11	010a1	20s1a	000a0	00000	00011	10121=	10	[22/23]
4-E	23000	d000h	a0000	21000	10020	01ba0	00b11	010a1	20s1a	000a0	02010	00011	10121=	9	[23/26]
4-I	23000	d000h	a0000	21000	10020	20ca0	00b11	010a1	00s1a	000c1	02011	00011	10120=	10	[21/23]
4-J	23000	d000h	a0000	20000	10020	20da0	10b11	010a1	00a1c	000c1	02011	00011	10120=	11	[22/23]
			k												
5:D	21000	d000h	a0012	21120	01131	20db0	20t11	000a1	02alb	000c1	01110	10010	10121=	0	[6/ 6]
5:E	21000	d000h	a0012	21120	01131	20db0	20t11	000a1	02alb	000c1	01110	10010	10121=	3	[3/ 4]
5:J	21000	d000h	a0011	21120	01131	20da0	20t11	000a1	02alb	000c1	01110	10010	10121=	5	[4/ 7]
5:P	21000	d000h	a0011	10120	01121	20da0	20t11	000a1	01alb	000a1	02110	10010	10121=	5	[6/10]
5:S	22000	d000h	a0011	10120	01121	20db0	20t11	010a1	01alb	000a1	00110	10010	10121=	2	[10/10]
5:GG	22000	d000h	a0012	10120	01121	20db0	20t11	010a1	01alb	000c1	00110	10010	10121=	1	[10/17]
5:CT	17000	d000h	a0011	10120	00120	30cb0	20t11	010p1	02alb	000c1	02110	20010	10121=	14	[8/17]
[X]	22000	d000h	a0010	10000	20120	00da0	10t11	010a1	00a1c	000c0	01010	10010	00021=	10	[16/17]
[Y]	22000	d000h	a0000	10000	20020	00da0	10b11	010a1	00a0c	000c0	01010	00010	00020=	8	[11/15]
			k												
[Z]	22000	d000h	a0000	20000	10020	00da0	10b11	010a1	00a1c	000c0	01010	00010	10020		
			k								1				
[E]	22000	d000h	a0000	20000	10020	00ca0	00b11	010a1	00a1a	000c0	01000	00010	10020		
			l								1				
			k								1				
			2								1				
			l								1				
			d								1				
			l								1				
			l								1				
			c								1				
			l								1				