

REVISION OF THE INDO-AUSTRALIAN SPECIES OF THE
GENUS *PHAECHROUS* CASTELNAU, 1840
(COLEOPTERA: SCARABAEIDAE, HYBOSORINAE),
WITH NOTES ON THE AFRICAN SPECIES

by

P. J. KUIJTEN

Division of Systematics and Evolutionary Biology, University of Leiden

With 22 text-figures and two plates

ABSTRACT

A revision of the Indo-Australian species and notes on the African species of *Phaeochrous* are given. Nine new species and three new subspecies are described, viz., *Phaeochrous australicus* (Australia), *compactus* (Sri Lanka), *elevatus* (South India, Sri Lanka), *enigmaticus* (Java, Bangla Desh, China), *lobatus* (Philippines), *madrassicus* (South India), *pletus* (Timor), *portuum* (Papua New Guinea), *pseudintermedius* (Vietnam, South China), *P. dissimilis* subsp. *vietnamicola* (Vietnam, South China), *emarginatus* subsp. *buruensis* (Moluccas), *intermedius* subsp. *occidentalis* (North India, Bhutan). A neotype for *Phaeochrous emarginatus* Castelnau is designated. Two species hitherto considered synonyms of *P. emarginatus* are recognized as species and subspecies respectively, viz., *P. intermedius* Pic and *P. emarginatus* subsp. *dauidis* Fairmaire. Eight species are considered synonyms of *P. emarginatus*, viz., *sumatrensis* (Westwood) (lectotype here designated), *hirtipes* (Macleay) (lectotype here designated), *alternatus* Fairmaire, *asiaticus* Lewis (lectotype here designated), *pallidus* Arrow, *celebensis* Pic, *perroudi* Pic, *gracilis* Petrovitz — the last five are new synonymies. Three species, viz., *P. suturalis* Lansberge, *dauidis* Fairmaire and *benderitteri* Pic, are considered subspecies of *emarginatus*. The status of *P. dubius* (Westwood), *indicus* (Westwood), *ruficollis* Fairmaire, *rugosicollis* Benderitter, *rufus* Pic and *tonkineus* Pic remains doubtful. *Phaeochrous nanus* Arrow is excluded from *Phaeochrous*.

Figures of male genitalia of all species and subspecies, a key and some notes on bionomics, are given.

Phaeochrous laeviceps Fairmaire and *tenuepunctatus* Fairmaire are removed from the list of African species, being no *Phaeochrous*, and the synonymization of *P. insularis* Linell with *laeviceps* is deleted.

INTRODUCTION

This is the first part of a revision of the Hybosorinae of southeastern Asia. The genera *Pantolasius* Lansberge, *Phaeochroops* Candèze, *Phaeochridius* Lansberge, *Microphaeochroops* Pic and *Mimocoelodes* Pic will be revised by me in future studies, whereas Paulian prepares a revision of the exclusively Papuan and Australian genera.

The species of *Phaeochrous* are distributed over tropical Africa, Madagascar, Aldabra, Yemen, large parts of continental and insular South-East

Asia, New Guinea and adjacent archipelagoes, North and West Australia. The Californian *P. behrensi* Horn, 1867, probably belongs to one of the Old World forms, imported by ship traffic, as suggested by Horn himself.

Short notes on African species of *Phaeochrous*

The species from Africa (including those from Madagascar, Aldabra, the Comores and Yemen) have been studied by Schouteden (1918), Burgeon (1928) and Endrödi (1959). The last author emphasized the difficulties in species delimitation, due to the occurrence of different forms of male genitalia, partly connected by transitions, in externally rather homogeneous material. On the other hand there may be a considerable variation in punctuation and in other external characters within the material of a given locality. Between 35 and 40 species had been described from the area studied by Endrödi, but he recognized only seven species, partly based on male genitalia, with five subspecies and twelve semispecies; furthermore he synonymized fifteen species. A reliable separation of the females proved impossible. Recently I could study, in a cursory way, the African material in the Tervuren Museum, which formed the basis of Endrödi's revision (1959). In my opinion the genital structures in African *Phaeochrous* are so strongly differentiated that a thorough examination of these characters, using also available data on exact habitats and external features, may well result in a much higher number of species.

Although it is far from me to criticize here Endrödi's revision, some obvious errors are to be eliminated.

1. The specimens in Tervuren identified by Endrödi in connection with his aforesaid revision as *Phaeochrous amplus* Arrow, 1909, do not belong to *Phaeochrous* at all but to *Hybosorus* Macleay. The conspicuously swollen last tarsal joint of the fore legs of the male, and many characters in mandibles, labrum, apical crown of bristles of hind tibia, etc., are incompatible with a place in *Phaeochrous*.

2. The series in Tervuren identified by Endrödi as *Phaeochrous laeviceps* (Fairmaire, 1893), belongs to the same genus, and may be to the same species, as the material mentioned under 1. However this may be, *laeviceps* (Fairmaire) and *tenuepunctatus* (Fairmaire, 1895), both considered *Phaeochrous* by Endrödi, were correctly described by Fairmaire as *Hybosorus*. Consequently they have to be eliminated from the list of African *Phaeochrous*.

3. *Phaeochrous insularis* Linell, 1897, is incorrectly synonymized with *laeviceps* (Fairmaire) in Endrödi's revision. According to the type series (Washington) *insularis* is a true *Phaeochrous*, whereas *laeviceps* is a *Hybo-*

sorus. As a consequence it is to be added to the list of African species.

In this respect some rectifications are to be made as well on Petrovitz' remarks on the Madagascan species of *Phaeochrous* (1975b: 621). He cites six species from Madagascar, including his new *P. gonsalvesi*.

1. Three of these species are no *Phaeochrous*, viz., *baliensis* (Brancsik), *laeviceps* (Fairmaire) and *tenuepunctatus* (Fairmaire), all belonging to *Hybosorus*. Petrovitz emphasized the "fundamental differences between *laeviceps/tenuepunctatus* and the remaining species of *Phaeochrous* in the construction of the clypeus, that is *Hybosorus*-like", but the real status of *laeviceps* and *tenuepunctatus* escaped him. The generic differences between *Hybosorus* and *Phaeochrous* are evident and need no discussion here (e.g. figs. of heads in Petrovitz' article, descriptions by Schmidt, 1913).

2. Consequently Petrovitz' synonymization, probably following Endrödi (1959), of *P. insularis* Linell, from Aldabra (not Madagascar), with *Hybosorus baliensis* and *H. laeviceps* is untenable.

THE ASIAN AND AUSTRALIAN SPECIES OF *PHAEOCHROUS*

The forms of *Phaeochrous* inhabiting the Indo-Australian Region present difficulties in species delimitation similar to those met with in the Afrotropical species. An important part of this area consists of the Malay, Philippine and Papuan-Melanesian Archipelagoes, and includes the warmer parts of the intricate Himalayan and South Asian mountain systems. Geographic isolation could have been expected to play a still more prominent role, with a proportionately more complicated diversification into (sub)species, than in the relatively uniform Afrotropical Region. If the suggestions made on the total number of African species should prove to be true, however, the reverse may eventually be the case.

In some of the islands well-defined forms have developed, without sympatric congeners, e.g. in Buru and Timor. In other insular localities, such as Java and Sri Lanka, several species may occur together and the series of some continental localities, in the mountainous area of South-West China and North Vietnam, include three or four forms of various taxonomical levels. It has still to be established whether all those forms are really sympatric and synchronic; it may well be possible that in several instances they were collected in different seasons or in different habitats of the same roughly indicated locality. As a consequence conclusions as to the exact taxonomical level are only tentative in some cases.

Nomenclatorial history. — Many species descriptions in this genus are inadequate and hardly offer useful features for species recognition. Genital

characters have been used only sporadically. Henceforth many specimens in the collections are misidentified, either being wrongly named *Ph. emarginatus* or being erroneously taken for a good species. Fortunately I could study type material of nearly all described forms, except for *Ph. emarginatus* Castelnau, *ruficollis* Fairmaire and *indicus* (Westwood).

The following chronological annotated list of the original descriptions may be of use for the discussion of synonymizations etc. later on in this revision. A checklist of the names now considered valid is given at the end of the paper.

- 1833, Dejean. — *Acallus emarginatus* Wiedemann.
- 1837, Dejean. — *Atimus emarginatus* Wiedemann, as a new name for *Acallus emarginatus*. Neave (1939) quotes both *Acallus* and *Atimus* as nomina nuda. Dejean's catalogues do not give descriptions relating to *Phaeochrous*. Wiedemann never published *Acallus emarginatus* (see below). Horn & Kahle (1937: 400) speak about: "... the endless nomina nuda (in litteris names)" ... in Dejean's catalogues.
- 1840, Laporte de Castelnau. — *Phaeochrous emarginatus* Wiedemann, (plus *P. senegalensis* Castelnau). Very scanty descriptions of genus and species; no references to Dejean and Wiedemann.
- 1841, Westwood. — *Silphodes sumatrensis* Westwood; *Silphodes philippinensis* Westwood. Descriptions of genus and species.
- 1846, Westwood. — *Silphodes indica* Westwood; *Silphodes dubia* Westwood. Extensive new description of *Silphodes*, including the above mentioned species, synonymization of *Atimus* and *Acallus* with *Phaeochrous*; Westwood thinks that Laporte's "slovenly description" makes a decision about the synonymy of *Phaeochrous* and *Silphodes* impossible; about *P. emarginatus* Wiedemann: "Wiedemann has described no species under such name".
- 1848, Erichson. — Quotes *Silphodes* and *Atimus* as synonyms of *Phaeochrous* Laporte.
- 1852, Westwood. — Although Westwood accepts the synonymization of *Silphodes*, *Atimus* and *Phaeochrous*, he criticizes the validation of *Phaeochrous* by Erichson, because of its insufficient diagnosis.
- 1856, Lacordaire. — Extensive diagnosis of *Phaeochrous*, rejection of Castelnau's description, approval of Westwood's description of *Silphodes*, confirmation of synonymy of *Phaeochrous* and *Silphodes*, first use of Castelnau as author's name instead of Laporte.
- 1863, Macleay. — *Silphodes hirtipes* Macleay.
- 1871, Von Harold. — *P. indicus* (Westwood) is synonym of *emarginatus* Castelnau; *Silphodes* is synonym of *Phaeochrous*.

- 1879, Fairmaire. — *Phaeochrous alternatus* Fairmaire.
 1885, Lansberge. — *Phaeochrous suturalis* Lansberge.
 1886, Fairmaire. — *Phaeochrous davidis* Fairmaire.
 1893, Fairmaire. — *Phaeochrous ruficollis* Fairmaire.
 1896, Lewis. — *Phaeochrous asiaticus* Lewis.
 1904, Blackburn. — Discussion of synonymy of *P. hirtipes* (Macleay) and *emarginatus* Castelnau, without definite conclusion.
 1909, Arrow. — *Phaeochrous dissimilis* Arrow; *Phaeochrous pallidus* Arrow.
 1913, Schmidt. — The only references given for the generic name are Castelnau, 1840, Lacordaire, 1856, Péringuey, 1901. An extensive description of *Phaeochrous* is given; *Silphodes* is a synonym of *Phaeochrous*; and without arguments *P. hirtipes*, *sumatrensis*, *indicus* and *alternatus* are quoted as synonyms of *P. emarginatus*.
 1913, Benderitter. — *Phaeochrous rugosicollis* Benderitter.
 1928, Pic. — *Phaeochrous benderitteri* Pic; *P. celebensis* Pic; *P. celebensis* var. *ruficeps* Pic; *P. diversipes* Pic; *P. intermedius* Pic; *P. rufus* Pic.
 1942, Arrow. — *Phaeochrous nanus* Arrow.
 1943, Pic. — *Phaeochrous perroudi* Pic; *P. tonkineus* Pic.
 1945, Paulian. — References to the generic name as in Schmidt, 1913; designation of *P. emarginatus* Castelnau, 1840, as type-species; states type-specimen, from Java, unknown; adds to the synonyms of *P. emarginatus* Castelnau: *P. davidis* Fairmaire, "being based on small specimens from Yunnan and North Tonkin" and *P. intermedius* Pic, being "according to the type an *emarginatus* with regular striae".
 1975, Petrovitz. — *Phaeochrous gracilis* Petrovitz.

Type-species of *Phaeochrous*; type of *P. emarginatus* Castelnau. — Castelnau (1840) included two species in his new genus *Phaeochrous*, viz., *sene-galensis*, as a new species, and *emarginatus* from Java, ascribed to Wiedemann. This last species had previously been quoted as "*Acallus emarginatus* Wiedemann, Java", and "*Atimus emarginatus* Wiedemann, Java", by Dejean (1833 and 1837, respectively). Obviously Castelnau had his doubts about the authorship of Wiedemann. In most cases he gives references to the original publication, when quoting other authors' species, but not in the case of Wiedemann's species. As early as 1846 (:163) Westwood correctly stated that "Wiedemann has described no species under such name", and from that time on Castelnau has been considered the author of *emarginatus*. According to Horn & Kahle (1935-1937) Wiedemann's collection of Coleoptera was deposited at the Hamburg Museum, but Gebien (1907) does not quote any types of Wiedemann in the Hamburg collections, that are destroyed during World War II.

Paulian (1945) designated *Phaeochrous emarginatus* Castelnau as type-species, although Castelnau's description is extremely superficial, and the type-specimen is unknown. Paulian (pers. comm., 1977) made inquiries for this type-specimen at the Melbourne Museum, where Castelnau's private collection of Coleoptera has been deposited (Horn & Kahle, 1935-1937), and at other relevant museums without result. Another obvious place where the type-specimen could be expected is the Hope Department at Oxford, but the most recent inventory of types in that collection did not reveal it (Ismay, pers. comm., 1977). However, in the *Phaeochrous* material of the Oxford collection I did find a male, labelled "Atimus emarginatus Wied. Java" in Hope's handwriting (Horn & Kahle, 1935-1937), which might have been the specimen upon which Castelnau based his description. Wiedemann's name, both on the label and in that description, needs not be mere coincidence, but a definite conclusion is not possible.

The type-specimen of *P. emarginatus* Castelnau not being found, I would not have hesitated to designate this Oxford specimen as neotype. However, its genital armature is so different from all other forms of Asiatic *Phaeochrous*, that it is necessary to establish a new species on it (see below, *P. enigmaticus*). Furthermore I came upon identical specimens, one in each instance, from "Com" (?Comores) (Oxford), "Yünan, Chine" (Paris), and "Rangpur Bengalen" (Geneva). The occurrence of a *Phaeochrous* species in localities so far apart, and confirmed by so small a number of individuals, seems rather enigmatical. False labelling in some of these specimens cannot be excluded. Therefore I decided to designate neotype a Javan specimen of the most common and widely distributed form, that with a few exceptions is named *P. emarginatus* Castelnau in all collections (see under *P. emarginatus*).

Phaeochrous Castelnau

Acallus Dejean, 1833: 149 (no diagnosis, only quotation).

Atimus Dejean, 1837: 165 (no diagnosis, replacement name for *Acallus*).

Phaeochrous Castelnau, 1840: 108 (diagnosis).

Silphodes Westwood, 1841: 41 (short diagnosis).

Silphodes Westwood, 1845: 160 (extensive new diagnosis).

Silphodes Westwood, 1852: 60 (*Atimus* and *Phaeochrous* are synonyms of *Silphodes*).

Phaeochrous Castelnau; Erichson, 1848: 717 (*Atimus* and *Silphodes* are synonyms of *Phaeochrous*).

Phaeochrous Castelnau; Lacordaire, 1856: 134 (diagnosis, *Acallus*, *Atimus* and *Silphodes* are synonyms of *Phaeochrous*).

Phaeochrous Castelnau; Schmidt 1913: 38 (extensive description).

The genus is distinguishable from the other hybosorine genera by the following characters. Eyes normally developed, first joint of antennal club enclosing the greater part of second and third joints; pronotum glabrous;

elytra striate, without longitudinal carenae; external tarsal claw in fore leg of male cleft.

Further description. — The following description of the genus is based on males of the Asiatic section of *Phaeochrous*. Female characters will be given at the end of this paragraph, as far as they are different from those of the males.

Colour: yellowish brown, via dark reddish brown, to nearly black; margins of head, pronotum and elytra often somewhat lighter, more reddish; ventral side reddish to dark brown. The light overall colour is not necessarily caused by immaturity of the specimen. I kept dozens of specimens from Malaya in captivity, and the few insects showing a light coloration at the day of their capture even after months had not notably darkened.

Length: approximately from 8 to 17 mm.

Head: labrum anteriorly emarginate, with a row of long, erect setae along its fore margin; anterior margin of clypeus concave; punctation of head very inconstant, often more or less transverse and confluent punctures anteriorly, gradually more rounded and isolated towards vertex, derm of vertex often partially without punctures; gena rounded and protruding laterally beyond eye, with a conspicuous tuft of yellowish, erect setae of different lengths.

Pronotum: disc with double punctation, most punctures isodiametric, the coarser punctures a few times the diameter of the fine ones; often a faint median longitudinal band with less developed or completely effaced punctation; derm from shining to opaque by microreticulation; lateral sides deplanate, the deplanation with much coarser punctation, and still more difference between large and small punctures, than on disc, and strongly opaque derm; base completely and finely marginate, the margination continued on sides, where it is much more developed, and borders the inner side of an elevated, somewhat convex, variably wide ridge; anterior margin bordered with a wide, flat ridge, gradually narrowing to the sides; anterior margin bisinuate, with well developed antero-lateral angles; base bisinuate in a variable degree, hind angles mostly well-developed, with more or less rounded apices; sides curved in various degrees and divergent towards base, but sometimes strongly curved inwardly in posterior half and consequently hind angles absent.

Elytra: in most cases completely glabrous or with sparse, hardly discernible, short, erect setae in apical area, sometimes most of elytral surface with setosity of variable size and density; 16-18 striae, composed of round to quadrangular punctures of variable depth and density, in several cases punctures so strongly irregular and scattered that the stria as such is not

recognizable, the punctation extending in those cases over (parts of) the adjacent interstriae; the striae bordering the sutural, 5th, 9th and 13th interstriae only exceptionally affected by this irregularity; lateral and apical regions of elytra always with scattered punctation; sides with a sharp carina, the external surface of which bears a fringe of long, reddish or yellowish, closely set, backward directed setae, both carina and setosity gradually diminishing in development towards apex of elytra; epipleuron invisible from above, folded inward, rather flat, very wide anteriorly, gradually and strongly narrowing towards apex; sutural interstria generally shining, considerably wider and more elevated than the other interstriae, scantily and minutely punctured; the other interstriae with fine, sparse punctation, and with derm varying from shining to completely opaque; sometimes interstriae filled up for the greater part by the extended stria punctures; 5th, 9th and 13th interstriae (or some of them) wider, more convex and more elevated over the greater part of the elytral disc, than the others, and nearly always bordered by striae with undisturbed punctation, the other interstriae flat to weakly convex.

Pygidium: disc with long, yellowish hairs, more closely set on lateral and apical margins.

Ventral side: prosternum with sharp, longitudinal, median ridge in front of fore coxae, posterior margin with an approximately triangular, backward directed protrusion, which bears a sharp, longitudinal, median ridge; abdominal sternites with long setae rather thinly distributed over whole surface, except last sternite in which setosity is restricted to posterior margin.

Fore legs: external margin of tibia with two strongly developed teeth, the third, basal one less developed, reaching at most approximately half the length of the median one; between these teeth and/or basally of them a series of 5 to 25 denticles, with their apices rounded off in various degrees, and gradually decreasing in size towards base of tibia, this reduction accompanied by a change in direction, the apical and median denticles being more or less vertical to tibial axis, the basal ones increasingly strongly directed forward; apical spur curved outward; outer claw somewhat longer than inner one and deeply incised, the shorter tooth of the bifurcation approximately parallel with the major one and at most about half as long as it.

Middle and hind legs: claws simple and about equal in length; each tibia with five longitudinal rows of long setae, extending from near base to apex, the longest setae of the upper row in hind tibia (this is the row ending at a slight distance externally to implantation of longer terminal spur) generally reaching apex of fourth or middle of fifth tarsal joint; terminal spurs unequal in length, acuminate; apex of hind tibia with a tuft of long setae,

unequal in length, near articulation of longer spur, and a crown of stiff, mixed long and short, bristles, at a certain distance around tarsal articulation.

Mandibles: more or less strongly protruding beyond labrum; lateral margin, and in a still higher degree anterior margin, bent upward, the margins often forming at their connection an obtuse, rounded angle; lateral margin fringed with long, outward directed setae.

Parameres: strongly asymmetric, the longer one often with dorsal tooth, excavations and ridges, the shorter one relatively simply built in most cases (fig. 1).

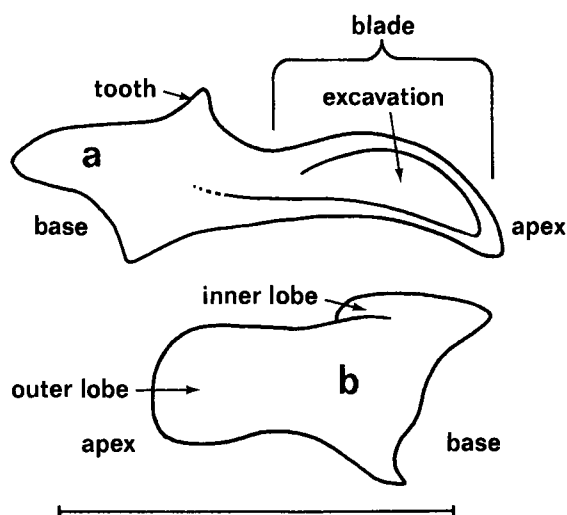


Fig. 1. Left, longer, paramere (a) and right, shorter, paramere (b) of *Phaeochrous emarginatus*; external, lateral aspect, schematized. Scale line represents approximately 1 mm.

Sexual dimorphism: Of many taxa, c.q. localities only specimens of one sex were available, and attribution of females to a given taxon often is disputable. Consequently the comparison between males and females is somewhat generalized. In females the lateral deplanations of pronotum are less wide to hardly present at all; irregularity, if shown, of strial punctation and differences of 5th, 9th, and 13th interstriae much less pronounced; setae of lateral fringe in elytra much shorter; all claws simple and approximately equal; setosity of legs less developed, longest setae in hind tibia reaching at most to half of third tarsal joint; bristles of apical crown in hind tibia more or less regularly decreasing in size from near longer apical spur; the mandibles much less to hardly protruding beyond labrum, evenly rounded,

margins at most slightly bent upward; setosity of ventral side shorter and more scanty.

Type-species: *Phaeochrous emarginatus* Castelnau, see above.

Characters used for species delimitation

Initially I studied a considerable number of characters which could be expected to be important for the delimitation of species and subspecies, and partly had been used by previous authors for this purpose. A number of forms, however, though well united by the slightly varying male genital armature, show considerable local and geographic variation in most of those characters. Overlap in ranges of variation between localities often occurs. Figures 2a and 2b give an impression of the variation and overlap for some external characters. It should be noted that some characters show allometry in relation to the size of the specimen, c.q. the mean size of the species. Due to the scantiness of material of many forms an adequate study of the allometry was impossible. As a consequence of the aforementioned facts, in my opinion taxon delimitation in this genus only is reliable, if based on male genital characters. Only in a few exceptional cases I used primarily external characters for the definition of taxa (*P. sulawesi*, *P. dissimilis* subsp. *vietnamicola*). Females could be characterized in a few cases only (*P. dissimilis*, *P. dissimilis* subsp. *vietnamicola*); most often their inclusion in a taxon is only acceptable if no other taxa from that special locality are known. Eventually the genital characters, and a few external characters that are of additional help in (sub)species definition, were retained (see pls 1 and 2):

Genital armature. — The highly asymmetric parameres (figs. 1 and 3-22) were studied in 1 to 20 specimens per locality, depending on the total number of specimens available in the sample. For the preparation of the figures the parameres were so placed, that the largest possible part of the lateral, external (or dorsal) surface was parallel with the drawing paper. Frequently the apical area and tooth of the left paramere are more or less torded inward. Consequently the drawings are projections of a curved surface.

Total length. — Defined as sum of lengths of head (from anterior margin of labrum to the middle of a line representing the shortest distance between the eyes), pronotum and elytra (shortest distance between apex of scutellum and apex of elytra).

Tibial denticulation. — Number of denticles on outer margin of left fore tibia, apart from the three larger teeth.

Microtexture of pronotum. — In a sampling area of the pronotal disc, near the base, the derm between the double punctation varies from smooth and shining to more or less opaque by microreticulation.

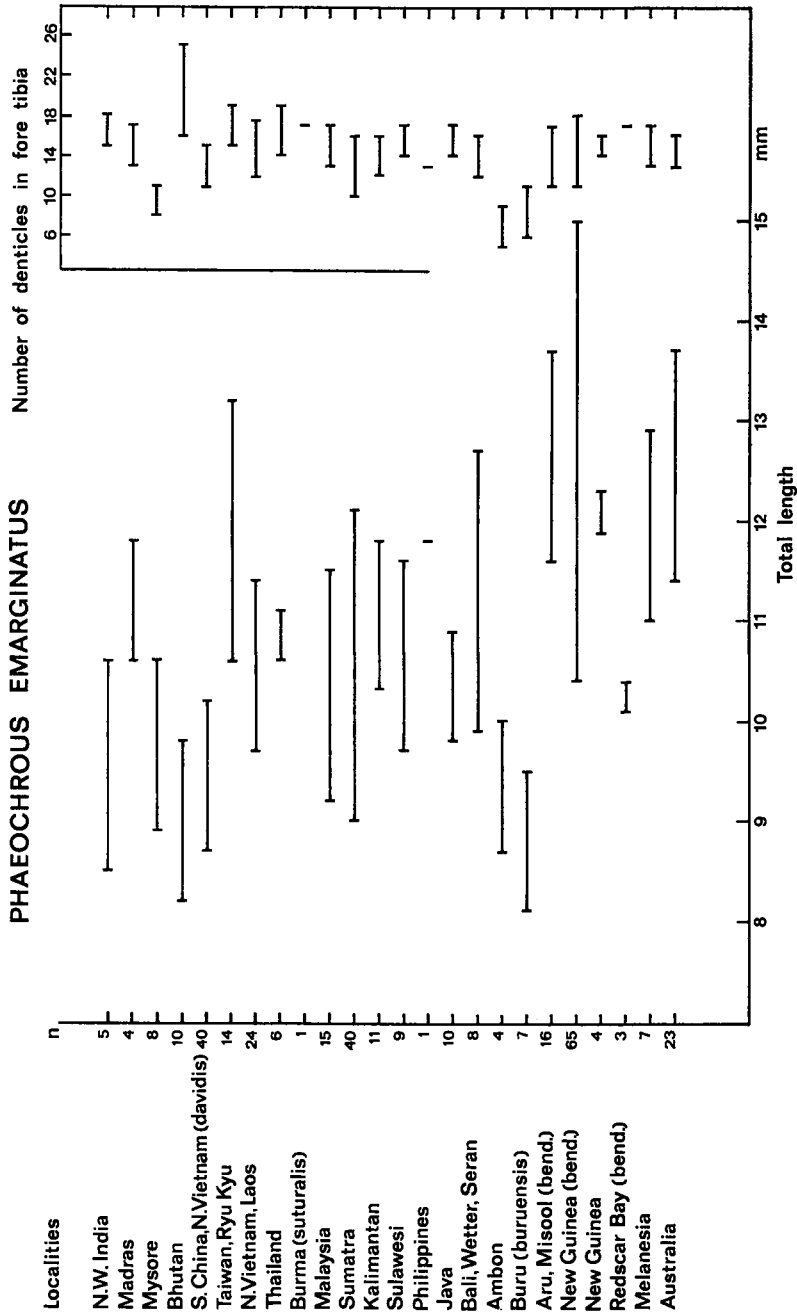


Fig. 2a. Variation in total length and number of denticles in fore tibia in *Phaeochrous emarginatus*; unless otherwise stated, referring to the nominal subspecies. Localities arranged geographically from North-West to South-East. n = number of specimens measured.

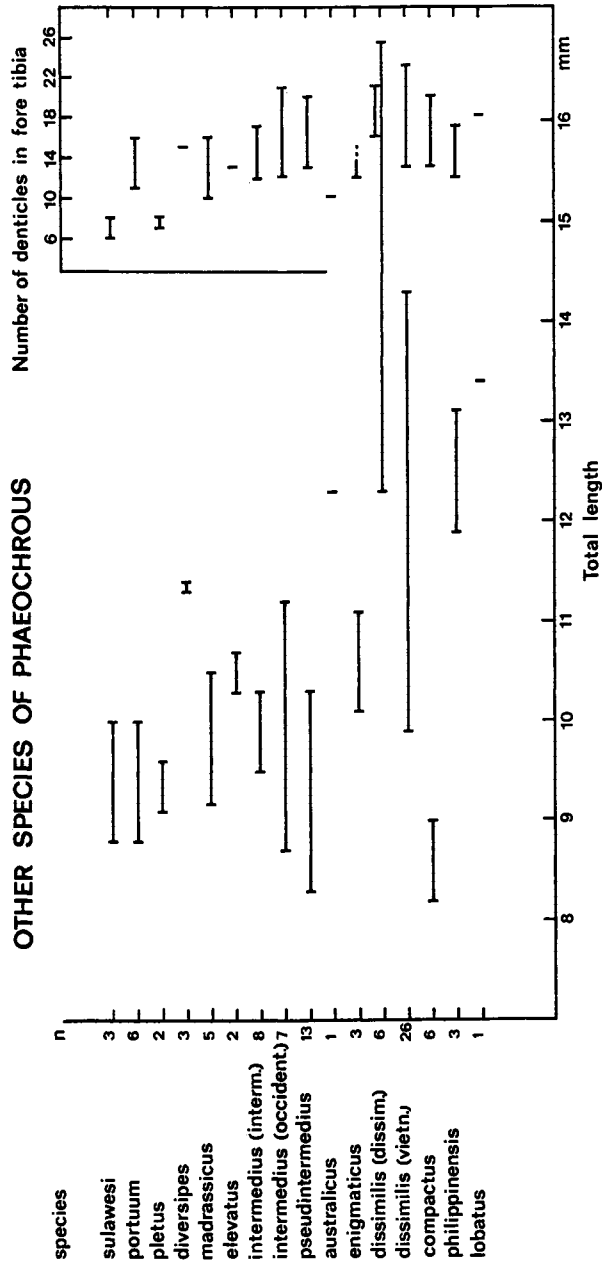


Fig. 2b. Variation in total length and number of denticles in fore tibia in the species of *Phaeochrous* other than *emarginatus*. Species arranged as in text. n = number of specimens measured.

Heterogeneity of interstriae. — In many instances one or more of the 5th, 9th, and 13th interstriae (counted from suture) are higher, more convex and wider, in various degrees, than the adjacent ones.

Irregularity of striae. — The striae are generally composed of a series of well-developed punctures. In many cases these punctures are placed irregularly; the irregularity ranges from a few out-of-line punctures to a scattered punctuation extending more or less far on the adjacent interstriae. As a consequence the striae themselves then are difficult to distinguish. The striae bordering the 5th, 9th and 13th interstriae only exceptionally show this irregularity; if so, the irregular punctuation hardly or not affects these interstriae. Both heterogeneity and irregularity were checked in a discal sampling area of the left elytron; in the basal, lateral and apical parts the structures show considerable alterations.

Setosity of elytra. — In the majority of specimens completely absent, but in some taxa the apical area with sparse, very short, erect setae, only visible when illuminated under a certain angle ($\times 50$). One species (*P. dissimilis*) shows more or less abundant, well developed, yellowish setae on the major part of the elytra.

Bionomics

According to the labels the beetles are attracted by light and by carrion. In East Africa the insects visit flowers of *Hydnora*, which give out a strong carrion-smell (Krikken, pers. comm.). In Senegal I found a few specimens in old, dried cow-dung. Several *P. emarginatus* subsp. *benderitteri* are labelled as grass(root) feeders.

In Malaysia I baited *P. emarginatus* subsp. *emarginatus* in considerable numbers with decaying fish in dense forest. Traps in more open country and cultivated areas did not attract any specimens. In captivity the insects proved to be exclusively nocturnal. As soon as dusk passed into darkness the beetles emerged from their subterranean shelters. The males flew and walked about in a very busy manner, whereas the females were rather slow and hardly flew. The beetles fed only on meat, fish and an occasional dead cockroach; grass and grass roots and other vegetable matter were not accepted. Although many copulations were observed, I could find neither eggs nor larvae in the insectary, in which the insects were kept.

KEY TO THE SPECIES

Due to the paucity of the material, the difficulties in associating the sexes of one species, etc. (see above), the present key is most tentative. It is based nearly exclusively on males.

1. Hind angles of pronotum strongly rounded, length 8.8-10 mm, 6-8 very obsolete protibial denticles, yellowish brown, genital armature fig. 8, South Sulawesi *sulawesi* (p. 26)
- Hind angles well developed, slightly rounded, 7.8-16.8 mm, mostly reddish to dark brown, 5-25 denticles 2
2. Length 9.2-9.6 mm, 7-8 very obsolete denticles, genital armature fig. 10, Timor *pletus* (p. 26)
- Not from Timor 3
3. Ixtrasutural (first) interstria opaque, 10 very weak denticles, 12.3 mm, genital armature fig. 16, Northern Territory (Australia)
. *australicus* (p. 31)
- Ixtrasutural interstria smooth and shining, with sparse, minute punctures 4
4. Basal tooth very small, hardly surpassing length of adjacent denticles 5
- Three well-developed teeth on external margin of fore tibia; basal tooth smaller than the other two, but clearly broader and longer than the adjacent denticles 6
5. Length 11.3-11.4 mm, 15 denticles, genital armature fig. 11, South India *diversipes* (p. 27)
- Length 8.3-10.3 mm, 13-20 denticles (mostly 13-16), genital armature fig. 15, South-West China, North Vietnam . *pseudintermedius* (p. 29)
6. Philippines, length 11.9-13.4 mm, 12-18 denticles, interstriae 5, 9 and 13 at most slightly heterogeneous, some striae and interstriae can hardly be distinguished, the irregular punctuation being widely extended,
 - a. Genital armature fig. 22, Luzon (Manila) . *philippinensis* (p. 35)
 - b. Genital armature fig. 21, Mindanao *lobatus* (p. 35)
 (*emarginatus* subsp. *emarginatus* also occurs in the Philippines, its elytral punctuation is not so strongly irregular, genital armature fig. 3.)
- Other genitalia, and other distribution 7
7. New Guinea and adjacent islands (Misool, Waigeu, Aru Islands, Melanesia) 8
- Buru, 8.1-9.5 mm, 6-11 denticles, striae regularly punctate, 5th, 9th and 13th interstriae approximately equal to the others, genital armature fig. 6, ♂ + ♀ *emarginatus* subsp. *buruensis* (p. 25)
- From more western localities 9
8. Length 8.8-10 mm, 11-16 denticles, northeastern coast of New Guinea, genital armature fig. 9, ♂ + ♀ *portuum* (p. 26)
- Length 10.1-15 mm, 11-18 denticles, New Guinea and adjacent islands, genital armature fig. 7, ♂ + ♀ . *emarginatus* subsp. *benderitteri* (p. 24)

(*rugosicollis*, from Redscar Bay, nr Port Moresby, 10.1-10.4 mm, colour testaceous, is probably identical with *benderitteri*)

(*emarginatus* subsp. *emarginatus* is scantily represented from New Guinea, \pm 12 mm, \pm 16 denticles, compare genitalia, fig. 3)

9. Continental and insular distribution
 - a. Length 8.2-13.7 mm, 5-25 denticles (mostly 10-19), genital armature as in fig. 3, in some populations slightly aberrant, from northwestern India to Ryu Kyu and Queensland
 *emarginatus* subsp. *emarginatus* (p. 18)
 - b. Length 10.1-11.1 mm, 12-13 denticles, genital armature fig. 17, elytral derm rather opaque, Java, China, Bangla Desh and (?) Comores *enigmaticus* (p. 32)
 - c. Length 10.3-10.7 mm, approximately 13 denticles, genital armature fig. 13, 5th, 9th and 13th interstriae hardly heterogeneous, South India, Sri Lanka *elevatus* (p. 28)
- Exclusively insular or exclusively continental 10
10. From Sri Lanka, length 8.2-9 mm, 13-20 denticles, striae mostly regular, interstriae 5, 9 and 13 at most very weakly heterogeneous, elytral derm rather opaque, genital armature fig. 20 *compactus* (p. 34)
- Continental forms 11
 (N.B. *emarginatus* subsp. *emarginatus* occurs in the greater part of the area covered by couplet 10; compare genital armatures)
11. India, Bhutan
 - a. Length 9.2-10.5 mm, 10-16 denticles, striae nearly always regular, South India, genital armature fig. 12 *madrassicus* (p. 27)
 - b. Length 8.7-11.2 mm, 12-21 denticles, striae generally regular, northern India, Bhutan, genital armature fig. 14
 *intermedius* subsp. *occidentalis* (p. 29)
- South-West China, Vietnam, Laos, Thailand, Burma 12
12. Elytra in adequately preserved specimens with well-developed setosity, derm of disc completely opaque, in such a degree that often only vestiges of striae and interstriae are visible, 12.3-16.8 mm, 16-21 denticles, Burma, Thailand, genital armature fig. 18, ♂ + ♀
 *dissimilis* subsp. *dissimilis* (p. 33)
- Elytra nearly or completely glabrous, derm shining to moderately opaque 13
13. Very small, 7.8 mm, 17 denticles, genital armature fig. 4, Burma
 *emarginatus* subsp. *suturalis* (p. 23)
- Length more than 8.6 mm 14
14. Strial punctation and heterogeneity of interstriae 5, 9 and 13 strongly

- variate, 8.7-10.2 mm, 11-15 denticles, South-West China, North Vietnam, genital armature fig. 5 *emarginatus* subsp. *dauidis* (p. 24)
- Elytral structures rather constant 15
15. Striae mostly regular, 5th, 9th and 13th interstriae homogeneous or weakly heterogeneous, 9.5-10.3 mm, 12-17 denticles, South-West China, Vietnam, Laos, Thailand, Burma, genital armature fig. 14
. *intermedius* subsp. *intermedius* (p. 28)
- All interstriae, except the heterogeneous ones, filled up with locally very dense to confluent punctation, 9.9-14.3 mm (most > 11 mm), 13-23 denticles (mostly 17-20), South-West China, North Vietnam, genital armature figs. 18 and 19, ♂ + ♀
. *dissimilis* subsp. *vietnamicola* (p. 33)

SPECIES DIAGNOSES, RECORDS AND NOTES

Unless stated otherwise, all descriptions, notes etc. refer to the males.

The arrangement of the species is based approximately on increasing difference in genital armature from *P. emarginatus*.

Phaeochrous emarginatus Castelnau

Dejean, 1833: 149 (*Acallus emarginatus* Wiedemann, Java).

Dejean, 1837: 165 (*Atimus emarginatus* Wiedemann, as a replacement for *Acallus*).

For remarks on Dejean's names see paragraph on type-species.

Castelnau, 1840: 109 (diagnosis, type-loc. Java).

Paulian, 1945: 35 (description, figs. 20 and 21 details and habitus).

Description. — The genital armature (figs. 3-7) is characteristic for this species. Although it is sufficiently uniform to unite the forms here considered *P. emarginatus* Castelnau, a certain degree of variation occurs. In combination with other morphological features and with geographical distribution, the genitalia permit the recognition of five subspecies. The external morphological characters show a rather great amount of variation, as may be apparent from the subspecies descriptions. Ascribing too much value to them would easily lead to the creation of a considerably higher number of subspecies, which would rather obscure than clarify the taxonomy of the species.

Neotype. — I here designate neotype a specimen in the Leiden Museum, labelled "Banjoewangi, Java, 1909-1910, Mac Gillavry" plus type and identification labels.

Phaeochrous emarginatus emarginatus Castelnau (stat. nov.)

(fig. 3, pl. 1)

Description. — Parameral excavation well defined, upper margin of blade gently curved, apex more or less curved downward. Although slight modifi-

cations in torsion and in development of tooth, blade and excavation in the longer paramere are common, they give no reason for a further splitting of this subspecies. Length 8.2-13.7 mm, with a slight tendency to increase from West to East, the largest specimens being found in the Ryu Kyu Archipelago and North Queensland. Fore tibia with 5-25 denticles, in the majority of specimens 10-19. Pronotal derm from completely shining to more or less opaque. A wide range of variation in strial punctation: regular punctation, a few out-of-line punctures and a scattered punctation may occur in a single specimen; different combinations as to number and place of striae involved may be realised in the material of a single locality; or a single combination may dominate in a locality. Heterogeneity of 5th, 9th, 13th interstriae considerably variable as to number of interstriae involved and as to development of width, convexity and elevation. For instance, the Kuala Lumpur series shows hardly any to a very weak heterogeneity, whereas material from Vietnam and Laos has the relevant interstriae slightly to markedly heterogeneous.

Type material. — See under species heading.

Material examined. — In addition to the neotype I examined material of this subspecies (synonyms included), frequently misidentified, in numbers up to more than 100 per locality, from the following countries. Localities from which only females were available not mentioned.

India: from foothills of the Himalayas to South India (Budapest, coll. Hardy, coll. Kuijten, Leiden, London, Oxford, Paris).

Sri Lanka: Belihul Oya, Wadduwa (Paris).

Bhutan: Phuntsholing, Samchi, Lhuntshi (Basle).

Vietnam: Cuc phuong, Tuong linh, Tuyen Quan, Vinh (Basle, Budapest, Paris).

Laos: near Luang Prabang (Paris).

China: Nanning, Kouy Tchéou, Yunnan, Thibet (Leiden, Paris).

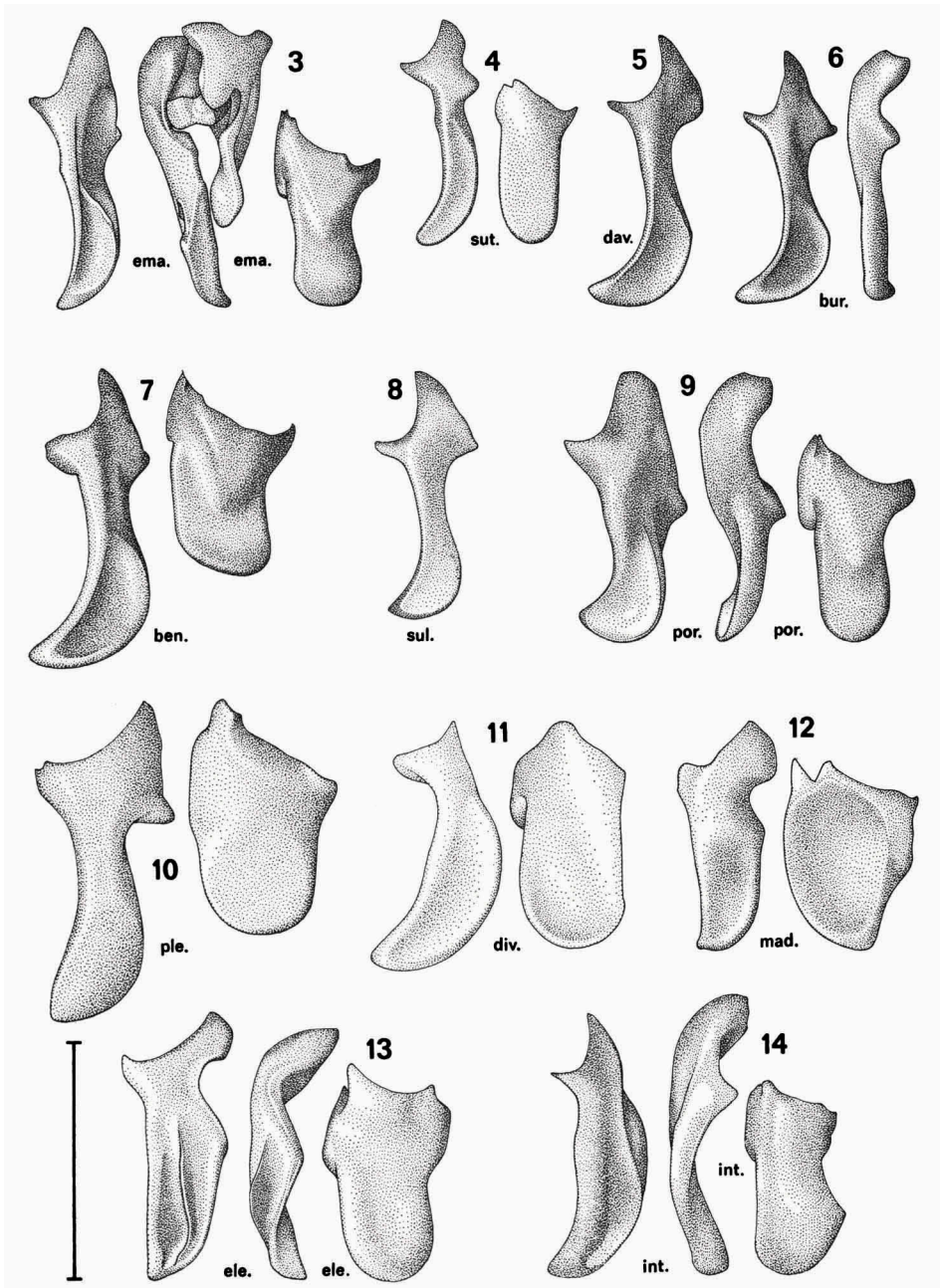
Taiwan. (Leiden).

Japan: Ryu Kyu Archipelago (London, Paris).

Thailand: Rayona (?=Rayong) (coll. Hardy), Niki in Kanchanaburi area (Leiden).

Malaysia: near Kuala Lumpur (coll. Kuijten).

Indonesia: Sumatra: many localities all over the island (Amsterdam, Leiden, London, Wageningen); Pini Island, near Mentawai Archipelago (Amsterdam); Simalur (Leiden); Java: several localities in West and East Java (Amsterdam, Leiden); Kalimantan (= Borneo): Kina Balu, Barabei (Amsterdam, Budapest, Leiden, Paris); Sulawesi (= Celebes): several localities all over the island (Amsterdam, Leiden, Paris); Bali (Amsterdam);



Figs. 3-14. External, lateral aspects (in figs. 3, 6, 9, 13 and 14 also dorsal aspects are represented) of parameres of *Phaeochrous*. Scale line is approximately 1 mm. 3 (ema.), *P. emarginatus* subsp. *emarginatus*, neotype; 4 (sut.), *P. emarginatus* subsp. *suturalis*, holotype; 5 (dav.), *P. emarginatus* subsp. *davidis*, from Tuong linh, compared with holotype; 6 (bur.), *P. emarginatus* subsp. *buruensis*, holotype; 7 (ben.), *P. emarginatus* subsp. *benderitteri*, from Aru Islands, compared with holotype; 8 (sul.), *P. sulawesi*, holotype; 9 (por.), *P. portuum*, holotype; 10 (ple.), *P. pletus*, holotype; 11 (div.), *P. diversipes*, from Travancore, compared with holotype; 12 (mad.), *P. madrassicus*, holotype; 13 (ele.), *P. elevatus*, holotype; 14 (int.), *P. intermedius*, from Tonkin, compared with holotype.

Wetter (Leiden); Tanimbar Archipelago (Paris); Seran (= Ceram) (Leiden, Oxford); Saparoea (Amsterdam); Ambon (Amsterdam); Irian (= West New Guinea): Fak Fak (Leiden).

Papua New Guinea: several localities on Astrolabe Bay (Budapest), New Britain (Paris).

Philippines. (Budapest, Leiden, Paris).

Australia: many localities in the northern part of Queensland (Amsterdam, Budapest, Canberra, Leiden, Paris, Queensland University), West Australia (Budapest).

Synonyms of *P. emarginatus* subsp. *emarginatus*.

Note. — For synonymizations by earlier authors see Nomenclatorial History.

Phaeochrous sumatrensis (Westwood)

Silphodes sumatrensis Westwood, 1841: 41 (diagnosis, type-loc. Sumatra).

Silphodes sumatrensis Westwood, 1846: 162 (extensive new diagnosis).

The genitalia are identical with *P. emarginatus* subsp. *emarginatus*. Two syntypes in London, here designated lectotype and paralectotype. Labels of lectotype: "Type", print in red ring; "Syntype", print in blue ring; "80-23"; "Sumatra, feeds on dead animal matter. May 1818", handwritten on nearly decayed label, placed by me into gelatin capsule; the same text written by me on new label; "Silphodes sumatrensis Westw. (fam. Geotrup^{ae})", handwritten; my type and identification labels. Labels of paralectotype: "Syntype", print in blue ring; "67-45"; "69", handwritten lila label; "sumatrensis Westw.", handwritten; my type and identification labels.

Phaeochrous hirtipes (Macleay)

Silphodes hirtipes Macleay, 1863: 125 (diagnosis; type-loc. Port Denison).

Judged from the genital apparatus a synonym of *P. emarginatus* subsp. *emarginatus*, although a trifle deviant. Four syntypes (3 males, 1 female) in Canberra. One of the males is here designated lectotype, the other specimens paralectotypes. The four specimens are identically labelled: "Pt Denison"; "syntype", print on red label; "in permanent loan from Macleay Museum University of Sydney", print; "Phaeochrous hirtipes Macl. Port Denison", handwritten; my type and identification labels. Port Denison is situated in Queensland.

Note. — The female specimen may be only tentatively included in this subspecies.

Phaeochrous alternatus Fairmaire

Phaeochrous alternatus Fairmaire, 1879: 112 (diagnosis; type-loc. New Britain).

Judged from genital characters a synonym of *P. emarginatus* subsp. *emarginatus*. Only holotype known (Paris), labelled: "N. Britain" plus type and identification labels.

Note. — In contradiction to Fairmaire's description, that gives 9.5 mm, the length of the specimen is 12 mm.

Phaeochrous asiaticus Lewis

Phaeochrous asiaticus Lewis, 1896: 332 (diagnosis; type-loc. Okinawa).

The genital armature is a little aberrant, but separation from *P. emarginatus* subsp. *emarginatus* on (sub)specific level seems unjustified. The form is best considered a synonym, until more material from Okinawa becomes available. Lewis stated to have seen three specimens (syntypes?). In accordance with recent correspondence with Pope, I here designate lectotype the only specimen in London. It is labelled: "Syntype", print in blue ring; "type", print in red ring; "Okinawa (Riukiu)", handwritten; "Japan, G. Lewis, 1910-320", print; "Phaeochrous asiaticus Lewis Type", handwritten; my type and identification labels. I could not trace the other two specimens.

Phaeochrous pallidus Arrow

Phaeochrous pallidus Arrow, 1909: 496 (diagnosis; type-loc. Nilgiri Hills).

The genital characters, although again a trifle deviant, only justify synonymization with *P. emarginatus* subsp. *emarginatus*. Lectotype, designated by Bacchus (1978), in London, labelled: "South Mysore, H. L. Andrewes"; "*Phaeochrous pallidus* Arrow, type", handwritten by Arrow; Bacchus's label "lectotype", in blue ring. Eight paralectotypes (des. Bacchus) from southern India in London. The ninth and tenth paralectotypes, from Sri Lanka, are closely related to or identical with *P. elevatus* sp. nov., see below (London).

Note. — In the Pic and Boucomont collections (Paris) I saw a series of 12 specimens from "Ceylan, Wadduwa, Coll. v. d. Poll", one male of which was additionally labelled "Compared with type, G. J. A., *Phaeochrous pallidus* Arrow" (G. J. A. = G. J. Arrow). After dissection the males proved to be a new species and the females may provisorily be included in it: *P. compactus*, see below.

Phaeochrous celebensis Pic

Phaeochrous celebensis Pic, 1928: 5 (diagnosis; type-loc. Bonthain).

The genital characters prove the synonymy with *P. emarginatus* subsp. *emarginatus*. The only specimen, the holotype (Paris), is labelled "Bonthain, S. Celebes, 1884, C. Ribbe".

Note. — All further specimens examined from Sulawesi were correctly identified as *emarginatus* (subsp. *emarginatus*); three unidentified specimens proved to represent a new species, *P. sulawesi*, see below.

Phaeochrous celebensis var. *ruficeps* Pic will be treated under *P. emarginatus* subsp. *benderitteri* (see below).

Phaeochrous perroudi Pic

Phaeochrous perroudi Pic, 1943: 15 (diagnosis; type-loc. Philippines).

Identical in genital characters with *P. emarginatus* subsp. *emarginatus*. The only known specimen, the holotype, is labelled "ins. philip." plus Pic's type and name labels (Paris).

Phaeochrous gracilis Petrovitz

Phaeochrous gracilis Petrovitz, 1975a: 222 (diagnosis; genitalia figured; type-loc. Phuntsholing).

In genital characters identical with *P. emarginatus* subsp. *emarginatus*; some external characters are rather constant in the Bhutan populations, but do not permit separation even on subspecific level. Holotype (Basle) with labels: "Phuntsholing, 2/400 m 15.4"; "Nat. Hist. Museum Basel - Bhutan Expedition 1972"; Petrovitz's type and identification labels. Furthermore I studied nine paratypes from the same locality and one from "Samchi, 7-11.5, 300 m", all collected during Bhutan Expedition 1972 (Basle). One of the paratypes is a female and its inclusion here is provisorily. A long series of Lhuntshi Valley, Bhutan, is also *P. emarginatus* subsp. *emarginatus* (Basle).

***Phaeochrous emarginatus suturalis* Lansberge (stat. nov.) (fig. 4)**

Phaeochrous suturalis Lansberge, 1885: 394 (diagnosis; type-loc. Minhla).

Description. — Longer paramere very long and slender. Length 7.8 mm, a very small form. Fore tibia with 17 denticles. Strial punctation slightly irregular to strongly scattered and extending on adjacent interstriae locally. Derm of pronotum shining.

Type material. — Holotype from "Minhla, Birmania, Comotto 81" with additional name and type labels in Genoa. Minhla is about 120 kms north of Rangoon.

Material examined. — Besides the holotype I saw a female from the same locality in the Oberthür coll. (Paris), identified as *suturalis*, which I would provisorily include in this subspecies.

Phaeochrous emarginatus davidis Fairmaire (stat. nov.) (fig. 5)

Phaeochrous davidis Fairmaire, 1886: 323 (diagnosis; type-loc. Yunnan).

Genital characters and vicariance in reference to *P. emarginatus* subsp. *emarginatus* (except a single specimen of the nominal subspecies in the Tuong linh series) justify subspecific rank.

Description. — Longer paramere rather slender, with a long apical excavation. Length 8.7-10.2 mm (based on 20 specimens). Fore tibia with 11-15 denticles. Strial punctation very variable, ranging from a few out-of-line punctures to a punctation scattered to such a degree that some striae are unrecognizable. Interstriae 5, 9 and 13 not heterogeneous at all, in others showing various degrees of heterogeneity. Pronotal disc with only faint microreticulation, nearly shining.

Type material. — Holotype, labelled "Yunnan" plus Fairmaire's type and name labels, in Paris.

Material examined. — Besides the holotype I studied approximately 200 specimens (including a number of females provisionally arranged under this subspecies) from Tuong linh (Budapest), and a male from Tonkin (Paris). The genitalia of this series were only partially checked.

Phaeochrous emarginatus benderitteri Pic (stat. nov.) (fig. 7)

Phaeochrous benderitteri Pic, 1928: 6 (diagnosis; type-loc. Ile Waigeu).

Genital characters, size and, with a few exceptions, vicariance in reference to *P. emarginatus* subsp. *emarginatus*, justify subspecific rank.

Description. — Left paramere with strong tooth and well-developed blade. Length 10.1-15 mm, more than 11 mm in most specimens. Fore tibia with 11-18 denticles. Strial punctures placed rather regularly to very scatteredly. Interstriae 5, 9 and 13 slightly to strongly heterogeneous. Pronotal derm on disc slightly opaque to completely shining.

Type material. — Holotype, from "Insel Waigeu", with type and identification labels, in Paris.

Material examined. — Besides the holotype I saw ten specimens from the same locality in Pic's collection (Paris). In part they were additionally labelled *P. waigouensis* and *P. waigeuensis*, without author or reference, evidently m.s. names. Furthermore I studied a considerable number of specimens, partly misidentified (e.g. *P. philippinensis*), partly identified as *P. emarginatus*, from Aru Islands (Budapest, Geneva, Leiden), Misool (Amsterdam), many localities in Irian and Papua New Guinea (Amsterdam, Budapest, Geneva, coll. Kuijten, Leiden). Some males from Solomon Islands and Bismarck Archipelago have slightly less *benderitteri*-like genitalia.

Synonym of *P. emarginatus* subsp. *benderitteri*.

Phaeochrous rugosicollis Benderitter

Phaeochrous rugosicollis Benderitter, 1913: 85 (diagnosis; type-loc. Redscar Bay).

In genital characters very close to *P. emarginatus benderitteri*. Length (10.1-10.4 mm, rather small for a *benderitteri*), light testaceous colour and restricted distribution might be arguments for subspecific rank. A decision, whether separate subspecies or identical with subspecies *benderitteri*, may best be postponed till more specimens of the original series of 18 have been studied. If the forms prove to be identical, *rugosicollis* has priority over *benderitteri*. I have examined the type (Paris), with labels "Redscar Bay, Br. New Guinea Lix 94"; "Type", red: "Phaeochrous rugosicollis type". Furthermore I have seen two specimens labelled syntype in Paris and one specimen in Leiden, all males, bearing the same locality label. As these specimens do not completely fit with Benderitter's description, the designation of a lectotype is also postponed best till more syntypes have been studied.

Phaeochrous celebensis var. *ruficeps* Pic

Phaeochrous celebensis var. *ruficeps* Pic, 1928: 6 (diagnosis; type-loc. Redscar Bay).

In all respects identical with *rugosicollis* specimens. The only specimen known is the holotype (Paris), labelled "Redscar Bay, Br. New Guinea Lix 94"; "type", print; "type" in Pic's handwriting; "var. *ruficeps* Pic".

***Phaeochrous emarginatus buruensis* nov. (fig. 6)**

The genital characters, small size and protibial denticulation justify subspecific level, and the absence of subsp. *emarginatus* and *benderitteri* in Buru may be additional corroboration of this view.

Description. — Longer paramere closely resembling that of *benderitteri*, but slightly more slender. Length 8.1-9.5 mm. Fore tibia with 6-11 denticles. Strial punctation regular, but punctures often rather unequal in diameter, giving the striae a somewhat waving aspect. Interstriae 5, 9 and 13 mostly all homogeneous, but in a few specimens some are weakly heterogeneous. Pronotal disc shining to slightly opaque. Scarce, yellowish, short setae on most of elytral surface.

Type material. — Holotype with labels "Buru, Station 1, Jan. 1922, L. J. Toxopeus"; "det. Boucomont 1924 *Phaeochrous emarginatus* Cast."; "Coll. Zoölogisch Museum Amsterdam" plus my type and identification labels. Six paratypes, from the same locality, but with other station numbers and dates, and with my type and identification labels. All the type material is in Amsterdam.

Material examined. — Apart from this type material I studied, from the same locality, a considerable number of males, and some females that certainly will belong to this subspecies, in the Amsterdam collection.

Derivation of name. — After Buru Island in Indonesia.

Phaeochrous sulawesi sp. nov. (fig. 8)

In genital characters *P. sulawesi* is very similar to *P. emarginatus* subsp. *emarginatus*. Its colour, some external features, and the fact, that I saw unmistakable *emarginatus* subsp. *emarginatus* from the same locality and date, justify a specific rank.

Description. — Length 8.8-10 mm. Fore tibia with 6-8 denticles. Some striae with regular punctation, others somewhat waving. Interstriae 5 and 9 heterogeneous. Pronotum with opaque derm; its hind angles strongly rounded, whereas they are well defined in all other species. Colour yellowish brown.

Type material. — Holotype and two paratypes (Leiden), labelled "Z. Celebes, Dec. 1936, Dr. J. v. d. Vecht" plus my type and identification labels.

Material examined. — Apart from the type-series no material was available.

Derivation of name. — *Sulawesi* is the Indonesian name for Celebes.

Phaeochrous portuum sp. nov. (fig. 9)

Characterized by its genital characters. In one locality it is sympatric with *P. emarginatus*, which corroborates its specific level.

Description. — Longer paramere with a strongly curved upper margin of the blade; apex directed downward. This results in a relatively short, stout paramere in comparison with, e.g., *P. emarginatus*. Length 8.8-10 mm. Fore tibia with 11-16 denticles. Some striae not completely regular, slightly waving. Interstriae 5, 9 and 13 slightly heterogeneous. Pronotal disc shining.

Type material. — Holotype and two identically labelled paratypes, with label "Seleo, Berlinhafen, N. Guinea, Biró 96" and three paratypes from "Friedrich-Wilh.-hafen, N. Guinea, Biró 96", plus my type and identification labels, all in Budapest. Seleo is about 150 kms east of Humboldt Bay, Friedrich-Wilhelmshafen on Astrolabe Bay, both in Papua New Guinea.

Material examined. — Apart from the type material I saw one male (Geneva) from Kaiser Wilhelmland (Papua New Guinea).

Derivation of name. — *Portuum* is genit. plur. of latin *portus* = port = Hafen.

Phaeochrous pletus sp. nov. (fig. 10)

The structure of the parameres, the considerable reduction in denticulation of fore tibia and the characters of the mandibles justify specific level.

Description. — Excavation in longer paramere completely filled up. Length 9.2-9.6 mm. Hardly any denticles between the large outer teeth in fore tibia; the 7-8 denticles in the basal part of the tibia hardly developed, only indicated by more or less deep incisions in the outer margin. Punctuation of striae showing only a few out-of-line punctures to rather irregular. In one specimen only the 9th interstriae, in the other one 5th, 9th and 13th heterogeneous. Disc of pronotum slightly opaque. Mandibles, in proportion to the modest total length of the insects, strongly protruded and with relatively highly elevated lateral and anterior margins.

Type material. — Holotype and one paratype in Basle, labelled "Soe, Timor, Dez. 1931, Handschin" plus my type and identification labels.

Material examined. — Apart from the type material, I saw a female with identical locality label (Basle), that probably belongs to this species.

Derivation of name. — *Pletus* (lat.) = filled up, referring to the convex outer side of the longer paramere.

Phaeochrous diversipes Pic (fig. 11)

Phaeochrous diversipes Pic, 1928: 5 (diagnosis; type-loc. Indes).

The structure of the parameres and the weak development of the proximal one of the protibial teeth are characteristic for the species.

Description. — Excavation in parameral blade very long, tooth hardly developed. Length 11.3-11.4 mm. About 15 denticles in outer margin of fore tibia; the proximal one of the three outer teeth can hardly or not be distinguished from the adjacent denticles. Strial punctuation irregular, extending on adjacent interstriae. Heterogeneity of interstriae 5, 9 and 13 varying from hardly visible to distinct. Pronotal disc shining.

Type material. — The holotype is in Paris; it is labelled "Kodicanel, R. P. Castets" plus type and name labels.

Material examined. — Apart from the holotype I saw three specimens, from Kanara and Travancore (both in southern India), in the collections of Oxford, Leiden and Paris.

Phaeochrous madrassicus sp. nov. (fig. 12)

Characterized by the structure of the parameres.

Description. — Left paramere rather compactly built, with weakly developed excavation and tooth, right paramere slightly tapering towards apex. Length 9.2-10.5 mm. From 10 to 16 denticles in fore tibia. Strial punctuation showing only a few out-of-line punctures. Interstriae 5, 9 and 13 homogeneous to weakly heterogeneous. Pronotal disc slightly opaque.

Type material. — Holotype and three paratypes in Paris, one paratype in

Leiden, all identically labelled "Indes orientales, Mts Kodeicanel, J. Castets 1886" plus my type and identification labels.

Material examined. — Apart from the type material I saw (Paris) five females with identical locality labels, which may provisorily be included in this species.

Derivation of name. — After Madras State, in which Kodeicanel is situated.

Phaeochrous elevatus sp. nov. (fig. 13)

Characterized by the structure of the longer paramere.

Description. — In the longer paramere the tooth is hardly developed and a strongly elevated, sharp ridge forms the upper margin of the excavation. Length 10.3-10.7 mm. Fore tibia with 13 denticles. Some striae waving, but hardly any punctures invading adjacent interstriae. Interstriae 5, 9 and 13 hardly heterogeneous. Pronotal disc with slightly opaque derm.

Type material. — Holotype labelled "Coromandel M. Maindron", "Genji, 25 aout - 15 sept. 1901", "Museum Paris, Coromandel, Genji, M. Maindron, 1902" plus my type and identification labels; one paratype with labels "Coromandel, Genji, 6.8.1903, R. P. Autemard", "Museum Paris, 1936, Coll. A. Boucomont" plus my labels; both in Paris.

Material examined. — Apart from the two type-specimens I examined six specimens from Sri Lanka (Paris, Geneva, coll. Kuijten, London), which I include in this species. They show slight aberrations in parameral characters and might perhaps be separated at a subspecific level. One of these Sri Lanka specimens is a paralectotype of *P. pallidus* Arrow (see under synonyms of *P. emarginatus* subsp. *emarginatus*).

Derivation of name. — *Elevatus* refers to the elevated upper margin of the parameral excavation.

Phaeochrous intermedius Pic

Characterized by its genital structure and some external features, as specified below.

Subspeciation. — The material from western localities is somewhat different from the eastern specimens. In my opinion, separation on subspecific level is justified.

Phaeochrous intermedius intermedius Pic (stat. nov.) (fig. 14)

Phaeochrous intermedius Pic, 1928: 5 (diagnosis; type-loc. Tonkin).

Characterized by the genital structure; the structure of striae and interstriae may give some help.

Description. — Excavation in longer paramere far extended towards base and rather narrow; tooth, in lateral view, hardly visible; short paramere slightly widening in apical half, with an angular protrusion on its lower margin. Length 9.5-10.3 mm. Fore tibia with 12-17 denticles. Strial punctation regular; or some striae with a few out-of-line punctures, or slightly waving. Interstriae 5, 9 and 13 homogeneous or at most very faintly heterogeneous. Derm of pronotal disc shining in all but one specimens.

Type material. — The holotype (Paris) is labelled "Chapa, Tonkin, 25-vii-1917 Jeanvoine" plus type and identification labels.

Material examined. — Apart from the holotype I saw two females, labelled *P. intermedius* Pic, in Pic's handwriting. They are from the same locality as the holotype and may provisorily be included in this species. I studied more material from Central Tonkin (1 male, Paris), Laos (4 males, Basle; 1 male, Paris), South-West China (2 males, Paris), Central Thailand (1 male, Leiden), and Burma (1 male, Geneva).

***Phaeochrous intermedius occidentalis* nov.**

Differing from the eastern subspecies mainly in structure of shorter paramere and in microtexture of interstriae.

Description. — Shorter paramere lacking the angular protrusion in its inferior margin. Length 8.7-11.2 mm. In Simla specimens 12-15, in the other ones 19-21 denticles in fore tibia. Striae as in the eastern subspecies. All interstriae nearly homogeneous; interstitial derm slightly opaque, while in the eastern subspecies it is more or less shining.

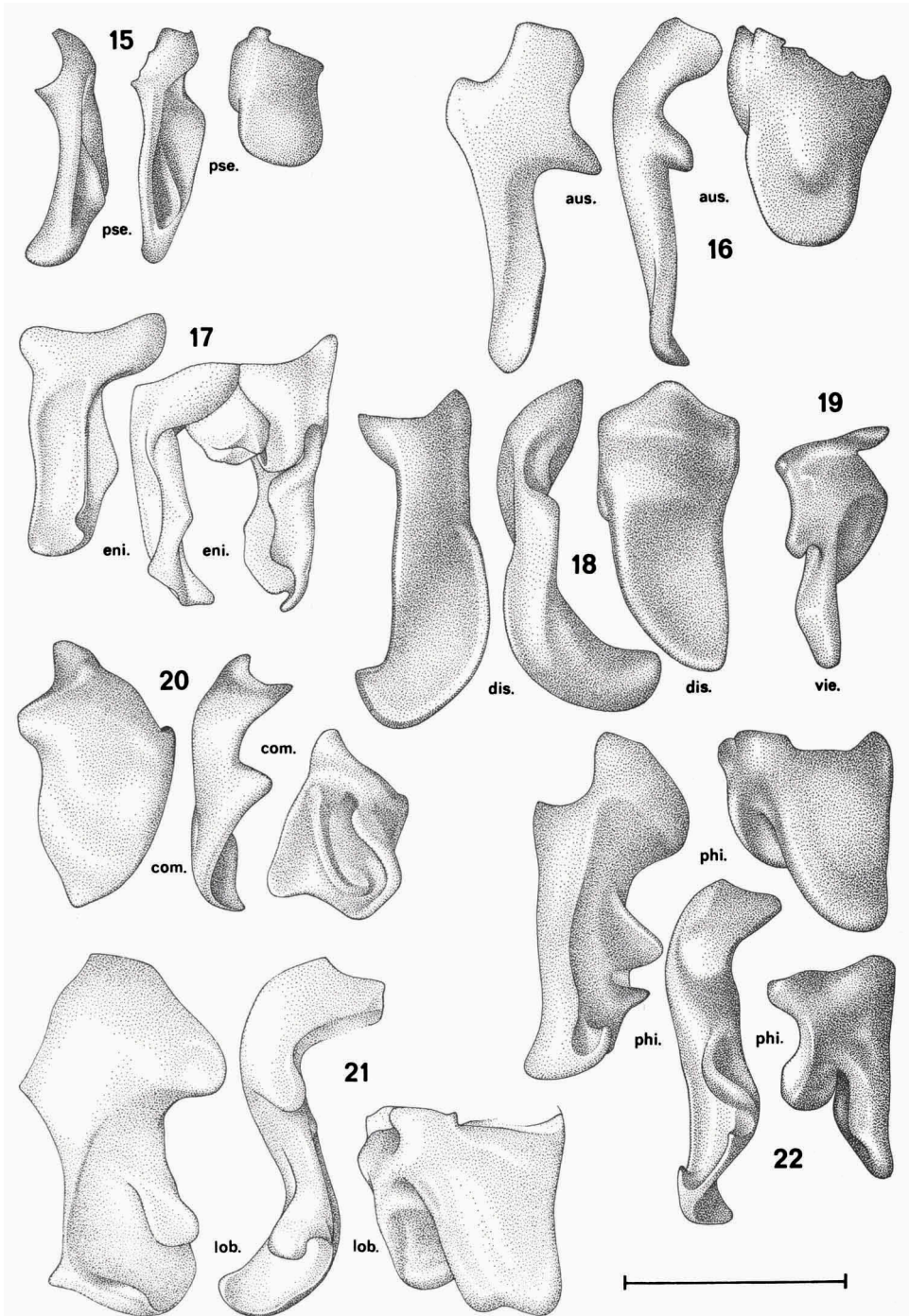
Type material. — Holotype and three paratypes in Paris, one paratype in Leiden, all labelled "Solan près Simla, 1896, Lakhat" plus my type and identification labels; one paratype from "Samchi, Bhutan, 7-11.5 1972, Bhutan Exped. N.H.M.B., 300 m" plus my labels, in Basle; one paratype from "Bhimtal, N.W. India, 8.1975, Smetaček, at light" plus my labels, in coll. Kujten.

Material examined. — Besides this type material I saw two females (Paris) from Solan, which probably belong to this subspecies.

Note. — The *Phaeochrous* series of Bhimtal (coll. Kujten, Leiden) includes, apart from this specimen of *occidentalis*, only males of *P. emarginatus* subsp. *emarginatus*, whereas the females are not attributable to either of the two forms.

***Phaeochrous pseudintermedius* sp. nov. (fig. 15)**

Parameral structure and some features of the external morphology justify a specific level.



Figs. 15-22. External, lateral, and dorsal aspects of parameres of *Phaeochrous*. Scale line represents approximately 1 mm. 15 (pse.), *P. pseudointermedius*, holotype; 16 (aus.), *P. australicus*, holotype; 17 (eni.), *P. enigmaticus*, holotype; 18 (dis.), *P. dissimilis* subsp. *dissimilis*, from Niki, compared with lectotype; 19 (vie.), *P. dissimilis* subsp. *vietnamicola*, holotype (right paramere, dorsally only); 20 (com.), *P. compactus*, holotype; 21 (lob.), *P. lobatus*, holotype; 22 (phi.), *P. philippinensis*, holotype.

Description. — General form of longer paramere as in *intermedius*, but the excavation is somewhat deeper and occupies only a limited part of the blade; shorter paramere rounded, without angular protrusion on inferior margin. Length 8.3-10.3 mm. In most specimens 13-16 denticles in fore tibia, but in some up to 20; proximal tooth hardly protruding beyond the level of the denticulation. Strial punctation very variable: nearly regular, showing some out-of-line punctures, to completely irregular and extending on adjacent interstriae. Interstriae 5 and 9 weakly to definitely heterogeneous, 13 mostly not different from the adjacent interstriae. Derm of elytra and pronotal disc slightly opaque.

Type material. — Holotype (Budapest) with labels "Vietnam: Cuc phuong, Ninh binh, 11 - 17.v.1966, Exp. Gy. Topál", "Nr. 361, from carcass" plus my type and identification labels; seven identically labelled paratypes, in Budapest and Leiden; four paratypes, with label "Kouy-Tchéou, Gan Chouen, Hin y Fou et Loyang, P. Cavalerie 1912" plus my type and identification labels, in Paris; one identically labelled paratype in Leiden.

Material examined. — Apart from the type material I saw ten more males from Kouy-Tchéou in Paris and Leiden.

Note. — Ninh binh is about 100 kms South of Hanoi; Kouy-Tchéou lies 600 kms North of Hanoi, in China's Kwei-Chow Province. In the Kouy-Tchéou material *P. pseudintermedius*, *intermedius*, *emarginatus* subsp. *emarginatus* and *dissimilis* subsp. *vietnamicola* are represented; this sympatry may give additional support for the species status of *P. pseudintermedius*.

Derivation of name. — *Pseudintermedius* refers to its similarity with *P. intermedius*.

Phaeochrous australicus sp. nov. (fig. 16)

Characterized by genital characters, microtexture of elytra and denticulation of fore tibia.

Description. — Left paramere with strong tooth, weakly developed blade, rounded apex and ill-defined excavation. Length 12.3 mm. The ten denticles in the fore tibia are very weakly developed; most of them blunt and broad, the ones between the large outer teeth (which are not worn off) difficult to distinguish. Some punctures of the striae placed in such a way, that the stria is not straight, but slightly waving. Interstriae 5, 9 and 13 slightly heterogeneous; interstriae distinctly opaque, even the sutural one, which in all other species is more or less strongly shining. Derm of pronotal disc rather opaque.

Type material. — Holotype labelled "Hiway Motel, via Daly Waters, N.T., Nov. 13-16, 1974, E. M. Exley & R. I. Storey, at light" plus my type and name labels, in Entomological Department, University of Queensland.

Material examined. — Apart from the type-specimen I saw two females with identical locality labels as the type-specimen, and four females from about the same area (Mataranka) and dates (13-18 Nov. 1974), which probably belong to this species (Entomological Department, University of Queensland).

Derivation of name. — *Australicus* = australian.

Phaeochrous enigmaticus sp. nov. (fig. 17)

Characterized by the genital structure.

Description. — Longer paramere with weakly developed tooth, long excavation, reaching nearly extreme apex of paramere, and an angular protrusion on upper margin of excavation; the apical part of the shorter paramere shows several strong protrusions, best seen in dorsal aspect. Length 10.1-11.1 mm. Fore tibia with at least 13 denticles (part of tibia broken off) in holotype from Java, 12-14 in the other ones. In two specimens striae punctation with only a few out-of-line punctures, in the other ones very irregular. Interstriae 5, 9 and 13 heterogeneous. Derm of pronotal disc opaque in various degrees; elytral derm rather opaque. Sparse short setae in apical region of elytra.

Type material. — Holotype in Oxford, labelled "Atimus emarginatus Wied. Java" in Hope's handwriting; one paratype from "Yünan Chine" (Paris); one paratype from "Rangpur Bengalen" (Geneva); one paratype from "Com" (Oxford); all additionally labelled with my type and name labels.

Note. — "Com" may indicate the Comores Islands. If so, the species might have been identical with *P. insularis* Linell, 1897, described from the nearby Aldabra Island. Study of the type material of *insularis* excluded this possibility. I did not feel completely sure about the correct labelling of the specimens. Therefore I compared their parameres and external characters with those of the African species, all represented in the Tervuren collection (mostly types and paratypes). From this it was evident, that *P. enigmaticus* is not identical with any of the described forms of the western part of the distribution area of the genus.

Material examined. — Apart from the aforementioned type material I saw two females from Rangpur (Geneva), which might be included here.

Note. — The three Rangpur specimens, originating from the Petrovitz collection, bear labels reading "Holotypus", "n.sp." (male); and "Typus", "n.sp.", respectively "Allotypus" (females). According to Besuchet (pers. comm., 1978) Petrovitz never described these specimens.

Derivation of name. — *Enigmaticus* (gr. enigma = puzzle) refers to the

puzzle of Wiedemann's authorship in the early literature and in the Oxford label, to the possibility, that the Oxford specimen might have been the insect on which Castelnau based his *P. emarginatus*, and to the paradox of an extremely poor representation in the collections and a wide distribution, partly in areas where much collecting has been done.

Phaeochrous dissimilis Arrow

The species is characterized by its parameral characters; the elytral structure, both in males and females, is characteristic also.

Subspeciation. — The material of the northeastern parts of the distribution area shows sufficient differences in its external features to separate it on subspecific level from the Burma and Thailand specimens.

Phaeochrous dissimilis dissimilis Arrow (stat. nov.) (fig. 18)

Phaeochrous dissimilis Arrow, 1909: 406 (Diagnosis; type-loc. Moulmein).

Description. — Excavation of longer paramere extending to basal part, upper surface of this paramere slightly concave, tooth absent, apical half strongly torced inward, apex curved downward. Length (of Leiden specimens) 12.3-16.8 mm. Fore tibia with 16-21 denticles. Striae, and interstriae 5, 9 and 13, well developed in the shining basal area of the elytra; gradually less distinct to nearly absent in the strongly opaque discal and apical parts; these parts closely set with rather homogeneous, partly very shallow punctures. Most of the opaque part of the elytra with many, relatively long setae in well preserved specimens. Derm of pronotal disc shining, in conspicuous contrast with the opaque part of the elytra.

Type material. — I studied the lectotype (London), designated by Bacchus (1978), labelled "Tenasserim Moulmein Fea Maggio 1887", "ex Coll. Oberthür 1913 - 353" plus type and identification labels of Arrow and Bacchus. A male with identical locality label and a label "paratype", is in the Oberthür Collection in Paris.

Material examined. — Apart from the aforesaid lectotype and "paratype" I saw 12 specimens from the same locality as the lectotype (Geneva, Paris) and 12 specimens from Niki, central West Thailand (Leiden).

Phaeochrous dissimilis vietnamicola nov. (figs. 18, 19, pl. 2)

Phaeochrous dissimilis Arrow; Paulian, 1945: 36 (description, localities in Tonkin and Laos).

Judging from the localities indicated, and from the descriptions of the male (interstriae well defined) and female (completely shining), I think Paulian's quotation refers to *P. dissimilis* subsp. *vietnamicola*. I did not see any spec-

imen of the nominal subspecies from Tonkin and Laos, neither in Paris nor in other collections.

Description. — Parameral structure identical with that of *dissimilis* subsp. *dissimilis*. Length (type and paratypes) 9.9-14.3 mm, more than 11 mm in most specimens. Fore tibia with 13-23 denticles, 17-20 in most specimens. Only the striae, bordering the heterogeneous interstriae 5, 9 and 13, are regular to slightly waving; the remaining striae indistinguishable as such, their well-impressed punctation extending over the interstriae and completely filling them up, locally very dense to confluent; interstitial derm somewhat opaque, but much less so than in the western subspecies. Derm of pronotal disc shining, in some specimens slightly microreticulate. Setosity of elytra much less developed than in *dissimilis* subsp. *dissimilis*, sometimes completely absent (rubbed off?).

Type material. — Holotype in Budapest, labelled "Vietnam: Tuong linh, near Phu ly, 21-27.v.1966, Exp. Gy Topál", "nr. 573 from trap in soil" plus my type and identification labels. Seven paratypes, identically labelled (Budapest); eight paratypes, from the same locality, but "nr 574 from trap with carcass" (Budapest); two paratypes from the same locality but dated 24-28.v.1966 and "nr 565, collected by lamp" (Budapest); eight paratypes from the same locality, but dated 19-23.v.1966 and "nr 520 from under carcass" (Budapest). All paratypes additionally labelled with my type and identification labels.

Material examined. — Apart from the aforesaid type material, I examined the following specimens: 89 males and 145 females from Tuong linh, with various date and sample number labels (Budapest); one male from Cuc phuong, North Vietnam (Budapest); one male from Kouy Tchéou, South-West China (Leiden), and one male from Tuyen Quan, Tonkin (Paris).

Derivation of name. — *Vietnamicola* = inhabitant of Vietnam.

Phaeochrous compactus sp. nov. (fig. 20)

Well characterized by the structure of the parameres.

Description. — Left paramere relatively short, somewhat triangular, without blade and excavation; right paramere with well defined ridges and excavations on the external lateral face. Length 8.2-9 mm. Fore tibia with 13-20 denticles. Strial punctation nearly regular, showing only a few out-of-line punctures. Interstriae 5, 9 and 13 at most very weakly heterogeneous; elytral derm rather opaque. Derm of pronotal disc not completely shining.

Type material. — Holotype in Paris, labelled "Ceylan, Wadduwa, Coll. v. d. Poll", "Compared with type G. J. A., *Phaeochrous pallidus* Arrow" (G. J. A. = G. J. Arrow), plus my type and identification labels. Four paratypes

in Paris, and one in Leiden, labelled "Ceylan, Wadduwa, Coll. v. d. Poll"; one paratype from "Colombo, Ceylon" in coll. Kuijten; all additionally labelled with my type and identification labels.

Material examined. — Apart from the type material I saw some females from Wadduwa and Colombo (Paris, coll. Kuijten) probably belonging to this species.

Derivation of name. — *Compactus* refers to the very compact structure of the left paramere.

Phaeochrous philippinensis (Westwood) (fig. 22)

Silphodes philippinensis Westwood, 1841: 41 (diagnosis; type-loc. Philippine Isles).

Silphodes philippinensis Westwood, 1846: 146 (diagnosis), pl. xi, fig. 2 (habitus).

Excellently characterized by its genital characters.

Description. — Longer paramere with a very deep excavation, in which three teeth of different lengths are situated; inner lobe of the shorter paramere strongly developed. Length 11.9-13.1 mm. Fore tibia with 12-17 denticles. Interstriae 5, 9 and 13 hardly heterogeneous, but well defined, in contrast to several other interstriae. These interstriae so densely covered with scattered punctures, that interstriae and striae are rather indiscernible as such. Elytral derm more or less opaque. Pronotal disc slightly opaque.

Type material. — Holotype in Oxford, bearing labels: "Manilla"; "*Silphodes philippinensis* Westwood"; "Type Hope, Proc. Ent. Soc. 1841, p. 41. Coll. Hope Oxon"; "Type Col: 495 *Phaeochrous philippinensis* Westw., Hope Dept. Oxford".

Material examined. — Apart from the type specimen I studied one male from "Manille" (Paris) and one male from "Philippijnen, A. v. d. Valk" (Leiden). Two females, labelled "Philippijnen, A. v. d. Valk" plus "19 juni 1879", may belong to this species (Leiden).

Phaeochrous lobatus sp. nov. (fig. 21)

The genital structure also in this species is very characteristic.

Note. — It is remarkable that only in the Philippines species evolved with genitalia so strikingly deviating from the other Indo-Australian species, a phenomenon to be studied in a much richer material from all over the Philippine Archipelago. I tried to tap several sources in the Philippines to get fresh, well-documented material, up till now without results.

Description. — Longer paramere with deep excavation, in the superoposterior part of which appears a long lobiform outgrowth with a slightly widened, rounded apex; tooth very broad, with round apex; inner lobe of shorter paramere strongly developed. Length 13.4 mm. Fore tibia with 18 denticles. Strial punctation irregular and extending on adjacent interstriae,

in such a degree that several striae and interstriae are unrecognizable as such (except interstriae 5, 9 and 13, and bordering striae). Interstriae 5, 9 and 13 slightly heterogeneous. Elytral and pronotal disc with somewhat opaque derm.

Type material. — The holotype (Paris) is labelled "Surigao, Mindanao, Baker", "Phaeochrous philippinensis Westwood" (two labels), plus my type and identification labels.

Material examined. — The aforesaid specimen is the only one I saw.

Derivation of name. — *Lobatus* refers to the conspicuous development of lobes in both parameres.

DOUBTFUL SPECIES

The following taxa are mostly based on female specimens; therefore their status has to remain doubtful. Several of them might well be synonyms of one of the aforementioned species.

Phaeochrous indicus (Westwood)

Silphodes indica Westwood, 1846: 161 (diagnosis; type-loc. India Orientalis).

Note. — Westwood (1846) quotes the type-specimen as "an ♀?". According to Von Harold (1871) the type specimen is "doubtless a ♀ of *P. emarginatus* Cast."; Schmidt (1913) and Paulian (1945) are of the same opinion.

Type material. — Contrary to Paulian's (1945) statement the type specimen is not in London; in Oxford it could neither be found (Ismay, pers. comm.). Pope (pers. comm.) suggested its presence in the Melly collection in the Geneva Museum (according to Horn & Kahle, 1935-1937). I examined this Geneva specimen, a female bearing labels as follows: "Indicus Gory Indes Int" in Melly's handwriting, plus "type?", handwritten with ball-point by Besuchet. These data are insufficient to consider it the type of *P. indicus* (Westwood).

Material examined. — Apart from this Geneva insect I saw one female from Madras (Oxford), named *indicus* by Arrow.

Phaeochrous dubius (Westwood)

Silphodes dubia Westwood, 1846: 162 (diagnosis; no type-loc.)

Type material. — The holotype, a female, is in Oxford. It lacks locality and date labels, the labels being: "189"; "Type"; "Silphodes dubia Westw."; "Type Hope Trans. Ent. Soc. 4, 1846, p. 162, Coll. Hope Oxon." and "Type Col: 496, Phaeochrous dubius Westw., Hope Dept. Oxford".

Material examined. — I only saw this type specimen.

Phaeochrous ruficollis Fairmaire

Phaeochrous ruficollis Fairmaire, 1893: 306 (diagnosis; type-loc. Hâ-lang).

Type material. — I could not trace the type-specimen in the Paris collections, the most obvious place where to look for it, nor could Paulian (1945). The description does not permit a conclusion as to the status of the form; it quotes a length of 7 mm, which is extremely small for a *Phaeochrous*. Fairmaire stated to have seen only this specimen, from Tonkin.

Material examined. — I saw a female (Paris) from Tonkin, named *P. ruficollis* by Benderitter.

Phaeochrous rufus Pic

Phaeochrous rufus Pic, 1928: 5 (diagnosis; type-loc. Kiukiang).

Type material. — The holotype, a female, is in Paris; its labels are: "Kiukiang Chine"; "type", two labels; identification label. The insect is 9.5 mm, not 5 mm as Pic quoted in his description.

Material examined. — I saw only the type.

Phaeochrous nanus Arrow

Phaeochrous nanus Arrow, 1942: 924 (diagnosis; type-loc. Pusa).

Note. — The species deviates so much from the normal *Phaeochrous* habitus in external characters that exclusion from that genus is necessary (e.g., *nanus* has all claws toothed). In a later study I hope to recur to this subject. I treat the species here, because Arrow (1942) considers it related to *P. rufus* Pic, "of the same small size", *nanus* being 5-6 mm. The *P. rufus* type, however, measures 9.5 mm, as I mentioned under that species. Arrow has only consulted Pic's description, as is evident from his text. Therefore the incorrect correlation is understandable.

Type material. — I studied the male lectotype and a female paralectotype, designated by Bacchus (1978). They are in London and are labelled: "Pusa Bihar, Mukerjee coll. 24.vi.24" plus type and identification labels.

Phaeochrous tonkineus Pic

Phaeochrous tonkineus Pic, 1943: 14 (diagnosis; type-loc. Tonkin).

Type material. — The only known specimen, the holotype, is in Paris. It is a female and is labelled: "Tonkin Demange"; "subopacus in litt."; "Type", two labels; "Paulian vidit 1943"; name label.

CHECKLIST OF THE INDO-AUSTRALIAN SPECIES OF *PHAEOCHROUS*

australicus Kuijten; Australia: Northern Territory

compactus Kuijten; Sri Lanka

dissimilis subsp. *dissimilis* Arrow; Burma, Thailand
dissimilis subsp. *vietnamicola* Kuijten; North Vietnam, South China, Laos
diversipes Pic; South India
elevatus Kuijten; South India, Sri Lanka
emarginatus subsp. *emarginatus* Castelnau; northwestern India to Ryu Kyu
 and Queensland
emarginatus subsp. *suturalis* Lansberge; Burma
emarginatus subsp. *dauidis* Fairmaire; North Vietnam, South China
emarginatus subsp. *benderitteri* Pic; New Guinea s.l. and adjacent islands
emarginatus subsp. *buruensis* Kuijten; Indonesia: Buru Island
enigmaticus Kuijten; Java, China, Bangla Desh, ? Comores
intermedius subsp. *intermedius* Pic; Laos, North Vietnam, South China
intermedius subsp. *occidentalis* Kuijten; Bhutan, northern India
lobatus Kuijten; Philippines: Mindanao
madrassicus Kuijten; South India
philippinensis (Westwood); Philippines
pletus Kuijten; Indonesia: Timor Island
portuum Kuijten; Papua New Guinea
pseudintermedius Kuijten; North Vietnam, South China
sulawesi Kuijten; Indonesia: South Sulawesi

Doubtful species

dubius (Westwood); no distribution data
indicus (Westwood); India
ruficollis Fairmaire; North Vietnam
rufus Pic; South China
tonkineus Pic; North Vietnam

Species excluded from *Phaeochrous*
nanus Arrow; India

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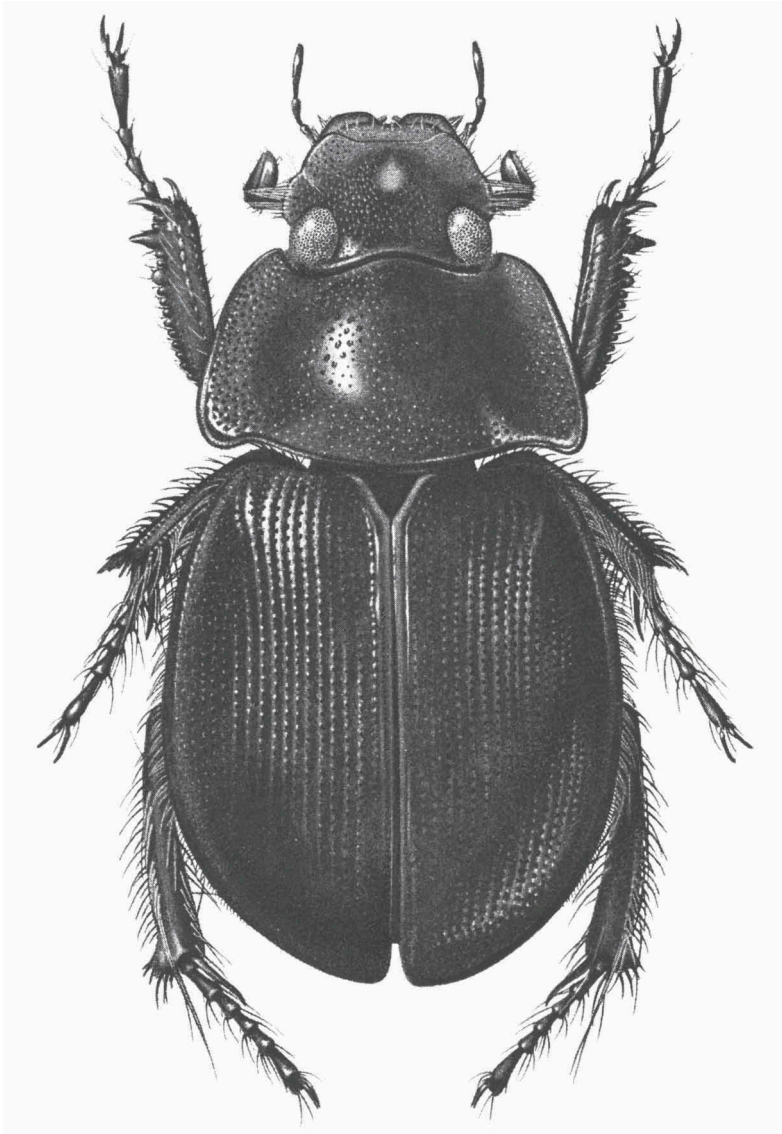
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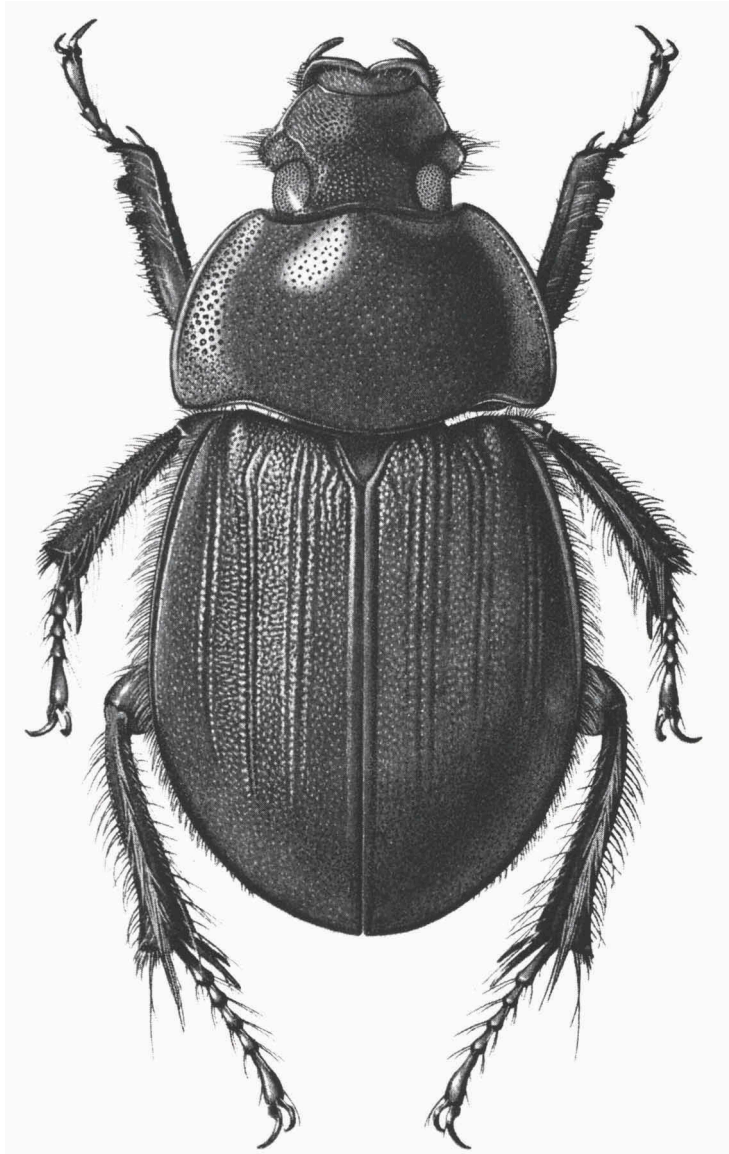
REFERENCES

- ARROW, G. J., 1909. On the characters and relationships of the less-known groups of Lamellicorn Coleoptera, with descriptions of new species of Hybosorinae, etc. — *Trans. ent. Soc. Lond.*, 4: 479-507.
- , 1942. A few new species of the Scarabaeid subfamily Hybosorinae (Coleoptera), with a key to the genus Phaeochroops. — *Ann. Mag. nat. Hist.*, (11) 9: 923-928.
- BACCHUS, M. E., 1978. A catalogue of the type specimens of the Scarabaeinae (Scarabaeidae) and the smaller Lamellicorn families described by G. J. Arrow. — *Bull. Br. Mus. nat. Hist. (Ent.)*, 37 (3): 97-115 (Hybosoridae: 112-114).
- BENDERITTER, E., 1913. Etude sur le genre Orphnus et descriptions de deux Orphnus et d'un Phaeochrous nouveaux (Col. Scarabaeidae). — *Bull. Soc. ent. Fr.*, 1913: 82-85.
- BLACKBURN, T., 1904. Revision of the Australian Aphodiides, and descriptions of three new species allied to them. — *Proc. R. Soc. Vict.*, (N.S.) 17, 1: 145-181.
- BURGEON, L., 1928. Notes sur les Phaeochrous d'Afrique et descriptions d'espèces nouvelles. — *Revue Zool. Bot. afr.*, 16, 2: 182-190, 27 figs.
- CASTELNAU, F. L. de Laporte, Comte de, 1840. Histoire naturelle des insectes. Coléoptères, 2 (1). — Paris: Société bibliophile, 563 pp., pls. 20-54.
- DEJEAN, P. F. M. A., 1833. Catalogue des Coléoptères de la collection de M. le Comte Dejean, éd. 2 (2). — Paris: Méquignon, 443 pp.
- , 1837. Idem, éd. 3 (1-4). — Ibidem, xiv + 503 pp.
- ENDRÖDI, S., 1959. Zur Kenntnis der afrikanischen Phaeochrous-Arten. — *Revue Zool. Bot. afr.*, 49, 3-4: 287-300, 12 figs.
- ERICHSON, W. F., 1848. Naturgeschichte der Insekten Deutschlands, 1. Coleoptera, 3. — Berlin: Nicolai, vi + 968 pp.

- FAIRMAIRE, L., 1879. Description de Coléoptères nouveaux ou peu connus du Musée Godeffroy. — *J. Mus. Godeffroy*, 14: 80-114.
- , 1886. Descriptions de Coléoptères de l'intérieur de la Chine. — *Annl. Soc. ent. Fr.*, 6: 303-356.
- , 1893. Coléoptères du Haut Tonkin. — *Annl. Soc. ent. Belg.*, 37: 303-325.
- GEBIEN, H., 1907. Verzeichnis der im Naturhistorischen Museum zu Hamburg vorhandenen Typen von Coleopteren. — *Jahrb. wiss. Anst.*, 24, Beiheft 2: 195-228.
- HAROLD, E. VON, 1871. Verzeichnis der von Dr. Beccari in Bogos gesammelten coprophagen Lamellicorniern. — *Col. Hefte*, 8: 1-28.
- HORN, G. H., 1867-1868. Descriptions of new genera and species of Western Scarabaeidae with notes on others already known. — *Trans. Am. ent. Soc.*, 1: 163-170, 4 figs.
- HORN, W. & I. KAHLE, 1935-1937. Ueber den Verbleib der entomologischen Sammlungen der Welt. — *Ent. Beih., Berl.-Dahlem*, 2, 1935: 1-160, 16 pls.; 3, 1936: 161-296, 10 pls.; 4, 1937: 297-536, 12 pls., figs.
- LACORDAIRE, T., 1856. Histoire naturelle des insectes. Genera des Coléoptères, 3. — Paris: Roret, 594 pp + Atlas, 16 pp, 40 pls.
- LANSBERGE, J. W. VAN, 1885. Descriptions d'espèces nouvelles de Coléoptères appartenant au Musée Civique de Gènes. — *Annali Mus. civ. Stor. nat. Giacomo Doria*, (2) 2: 375-400.
- LEWIS, G., 1896. On new species of Coleoptera from Japan, and notices of others. — *Ann. Mag. nat. Hist.*, (6) 17: 329-343.
- LINELL, M. L., 1897. On the insects collected by Doctor Abbott on the Seychelles, Aldabra, Glorioso, and Providence Islands, with descriptions of nine new species of Coleoptera. — *Proc. U.S. natn. Mus.*, 19: 695-706.
- MACLEAY, W., 1863. Descriptions of new genera and species of Coleoptera from Port Denison. — *Trans. ent. Soc. N.S. Wales*, 1, 1: 106-130.
- NEAVE, S. A., 1939. *Nomenclator zoologicus*, 1. — London, Zool. Soc. London; 957 pp.
- PAULIAN, R., 1945. Coléoptères Scarabéides de l'Indochine, 1. — *Faune Empire franç.* 3: 1-228, 105 figs., 1 map. Paris: Larose.
- PETROVITZ, R., 1975a. Ergebnisse der Bhutan-Expedition 1972 des Naturhistorischen Museums in Basel, Col. Scarabaeidae. — *Entomologica Basiliensia*, 1: 215-222, 2 figs.
- , 1975b. Neue Aphodiinae, Hybosorinae, Bolbocerinae und Orphninae (Coleoptera, Scarabaeidae). — *Revue suisse Zool.*, 82, 3: 615-624, 2 figs.
- PIC, M., 1928. Nouveautés diverses. — *Mélang. exot.-ent.*, 52: 1-32.
- , 1943. Coléoptères du globe. — *Echange*, 59: 1-16.
- SCHMIDT, A., 1913. Coleoptera Lamellicornia, Fam. Scarabaeidae, Subfam. Aegialiinae, Chironinae, Dynamopinae, Hybosorinae, Idiostominae, Ochodaeinae, Orphninae. — *Genera Insect.*, 150: 87 pp., 3 pls.
- SCHOUTEDEN, H., 1918. Hybosorides nouveaux d'Afrique. — *Revue zool. afr.* 5, 3: 193-204.
- WESTWOOD, J. O., 1841. A memoir . . . upon *Maechidius*, a genus of Lamellicorn beetles, with descriptions and figures of some new genera belonging to the same tribe. — *Proc. ent. Soc. London*, 1841: 40-41 (The same memoir was published in *Ann. Mag. nat. Hist.*, 8: 457-458, in 1842).
- , 1845-1846. On the Lamellicorn beetles which possess exerted mandibles and labrum, and 10-jointed antennae. — *Trans. ent. Soc. Lond.*, 4 (1845) (2): 155-160; 4 (1846) (3): 161-180, pl. xi.
- , 1852. On the Lamellicorn beetles which possess exerted mandibles and labrum, and 10-jointed antennae. Being a supplement to a memoir published in the fourth volume of the Transactions of the Entomological Society. — *Trans. ent. Soc. Lond., N.S.*, 2 (1): 59-74.



Phaeochrous emarginatus subsp. *emarginatus* from Kuala Lumpur; total length 12.3 mm.



Phaeochrous dissimilis subsp. *vietnamicola* from Tuong linh (Vietnam); total length 15.2 mm.