

A contribution to the knowledge of *Pseudohomonyx* Arrow, 1908 (Coleoptera: Scarabaeidae: Dynastinae)

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Abstract. Two new species of the dynastine genus *Pseudohomonyx* Arrow: *Pseudohomonyx loksadoensis* sp. nov. and *Pseudohomonyx minor* sp. nov. are described, illustrated and compared with their congeners. Parameres of the new species are figured and compared with those of their relatives. *Pseudohomonyx javanus sumatrensis* (Fairmaire, 1896) is synonymized with *Pseudohomonyx javanus javanus* (Burmeister, 1847) and its unusual distribution is briefly discussed. Distributions of all species occurring in the Great Sunda Islands are discussed and some new records are given.

INTRODUCTION

The genus *Pseudohomonyx* was established by Arrow (1908) with *P. borneensis* Arrow, 1908 designated the type species. Four previously known species were transferred to *Pseudohomonyx* from *Heteronychus* Dejean, 1833 by Arrow (1908): *P. morator* (Fabricius, 1798), *P. lansbergei* (Schaufuss, 1887), *P. javanus* (Burmeister, 1847) and *P. sumatrensis* (Fairmaire, 1896). *Pseudohomonyx lansbergei* was later transferred to *Papuana* Arrow, 1911, and *P. sumatrensis* was demoted to a subspecies of *P. javanus* by Endrödi (1985: 317). Subsequently, Arrow (1911: 159) described *P. crassus* from Borneo, and in the *Coleopterorum Catalogus* (1937: 32) listed five species of *Pseudohomonyx*: *P. borneensis* Arrow, *P. crassus* Arrow, *P. javanus* (Burmeister), *P. palavanus* Prell, 1912 and *P. sumatrensis* (Fairmaire).

Following Arrow's works there have been no taxonomical papers on *Pseudohomonyx* until Endrödi (1985: 315), who provided the first key, listed *P. borneensis* Arrow, *P. palavanus* Prell, *P. crassus* Arrow and *P. javanus* (Burmeister), and demoted *P. sumatrensis* (Fairmaire) to a subspecies of *P. javanus*.

Miyake & Yamaya (1997, 1999, 2000) added several species from the Philippines, two species from the Malaysian part of Borneo, and one species from the Belitung Island in Indonesia.

During the last decade we had an opportunity to study numerous *Pseudohomonyx* specimens from Borneo, Sumatra and Java, which led to the discovery of two new species, one from Kalimantan (Borneo) and one from the highlands of West Sumatra. Both species are described in this paper. We also examined approximately 40 specimens of *P. javanus* (Burmeister) from Java and Sumatra, and found populations of these two islands not to warrant subspecific distinction. *Pseudohomonyx javanus sumatrensis* (Fairmaire, 1896) is therefore synonymized with *P. javanus javanus* (Burmeister, 1847).

MATERIAL AND METHODS

The following collection codens are used in the text:

BMNH Natural History Museum, London, UK;

MNHN Muséum national d'Histoire naturelle, Paris, France;

NMSM Nagaoka Municipal Science Museum, Nagaoka, Japan;

SJCP private collection of Stanislav Jákl, Praha, Czech Republic.

All specimen sizes are from the anterior margin of the clypeus to the apex of the elytra. Types are provided with printed labels that give the name of the taxon, HOLOTYPUS (red label) or PARATYPUS (yellow label), sex symbol, number of the paratype, and St. Jákl et J. Zidek det. 2017. Genitalia of all available males were dissected. Exact label data are cited for the material examined; individual labels are separated by double slashes (//), individual lines are separated by single slashes (/).

TAXONOMY

Pseudohomonyx Arrow, 1908

Pseudohomonyx Arrow, 1908: 327; type species *Pseudohomonyx borneensis* Arrow, 1908, original designation; Arrow 1937: 32; Endrődi 1985: 315.

Pseudohomonyx loksadoensis sp. nov. (Figs. 1-5, 19-20)

Type locality. Indonesia, SE Kalimantan, Kandangan District, Loksado village env.

Type material. Holotype ♂ (SJCP) labelled: Ind., S Kalimantan prov./Kandangan distr., 900 m/LOKSADO 17 km NE/15.11.97-15.1.98/St. Jákl leg; Paratype No. 1 ♀ (SJCP) labelled: INDONESIA/S Kalimantan /Kandangan district//17 km NE Loksado/3.-22.9.1997/St. Jákl lgt; Paratype no. 2 ♀♀ (SJCP) labelled: Indonesia, S Kalimantan prov./Kandangan distr., LOKSADO/17 km NE, St. Jákl lgt, 15.-30.11.97.

Description of holotype. Body length (excluding pygidium) 23.0 mm, maximum elytral width 11.2 mm. Black with brownish sutural ridge and brown ventral setation.

Head. Black, frons with rather dense transverse striolation, which is much finer on clypeus. Transverse carina separating frons and clypeus indicated only by an obtuse tubercle at each side. Lateral and apical margins of clypeus bordered. Apex almost straight. Mandibles obtusely rounded. Antennae short, brownish, scape with long and dense setation.

Pronotum. Black, punctation very fine and simple, uniformly distributed throughout length. Frontal impression large and deep, reaching approximately midlength, from there faint line nearly reaching base. Frontal tubercle large. Margins bordered except base. Posterolateral margin emarginate.

Scutellum. Black, impunctate, more than twice wider than long, apex broadly rounded.

Elytra. Black with dark brown sutural ridge and apex. Each elytron with 9 striolae bearing circular punctures. First interval wider than second and third combined, with rather dense and deep punctation running throughout length. Apex moderately punctured. Sutural ridge flat, impunctate. Humeral and apical calli present, but very obtuse.

Pygidium. Black, with moderate irregular punctation throughout length, but less dense at apex.

Venter. Chestnut brown with reddish setation. Abdominal disc glabrous, sides of each ventrite with punctation bearing setae. Metasternum with deep and dense punctation, only disc impunctate and weakly glossy. Metasternal setation reddish, rather long and dense. Prosternum and mentum with very dense punctation and cover of reddish setae.

Legs. Femora brownish, on posterior and anterior margins striolate and setose. Tibiae dark brown to black, setose especially on inner sides. Meso- and metatibiae carinate in posterior half. Protibia tridentate. Meso- and metatarsi black, protarsi brownish with extremely enlarged and thickened terminal tarsomere, terminal tarsomere only as long as preceding tarsomeres.

Aedeagus. No setation in apical part of parameres. Ventral sides of parameres with teeth at midlength (Figs. 4-5).



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Figs. 1-5. *Pseudohomonyx loksadoensis* sp. nov., holotype male, length 23 mm. 1) Dorsal habitus. 2) Ventral habitus. 3) Head and pronotum. 4) Aedeagus, dorsal view. 5) Aedeagus, left lateral view.

Variability. Male known only by the holotype.

Sexual dimorphism. Females slightly smaller, 22.3 and 22.5 mm. Carina separating frons and clypeus almost absent. Mandibles laterally sinuate. Punctuation of first elytral interval not as dense as in male, present mainly at apex and base of interval. Pygidial punctuation finer, especially at apex. Protarsi not thickened. Dorsal and ventral coloration nearly black. Abdomen more arched, legs shorter.

Differential diagnosis. This is a large species without setation at apex of parameres. It occurs with *Pseudohomonyx crassus* Arrow (Figs. 6-9), from which it differs by absence of paramere setation, narrower and more elongate pronotal impression (in males), very broad and punctate first elytral interval (narrower and impunctate in *P. crassus*), emarginate posterolateral pronotal margins (in males) (rounded in *P. crassus*), and extremely enlarged terminal protarsomere (in males) (not enlarged in *P. crassus*). Females can be distinguished mainly by a very wide first elytral interval, which is wider than the second and third intervals combined (much narrower and impunctate in *P. crassus*).

From other *Pseudohomonyx* species occurring in Kalimantan (*P. borneensis* Arrow [Figs. 10-13], *P. extradentatus* Miyake & Yamaya and *P. similis* Miyake & Yamaya) it can be distinguished by the following complex of characters:

For males: indistinctly developed carina separating frons and clypeus; large and elongated pronotal impression followed by longitudinal midline nearly reaching pronotal base; first elytral interval wider than second and third intervals combined; dense and rather deeply punctate first elytral interval; emargination of pronotal posterolateral margins; scutellum more than twice wider than long; moderately deep and dense punctuation of elytral apex and pygidium; extremely enlarged and thickened terminal protarsomere; parameres without setation at apex.

For females: carina separating frons and clypeus nearly absent; mandibles laterally emarginate; first elytral interval nearly as wide as second and third intervals combined; first elytral interval punctate; punctuation of elytral apex rather dense and deep, punctures circular; pygidial punctuation rather fine, near apex almost absent; dorsal and ventral coloration nearly black; length 22.3-22.5 mm (excluding pygidium).

Etymology. Named after Loksado village, the type locality.

Distribution. Indonesia: SE Kalimantan.

***Pseudohomonyx crassus* Arrow, 1911**

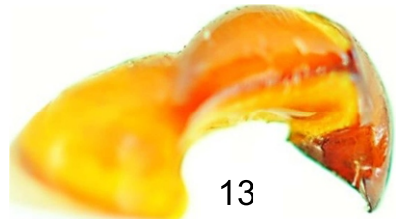
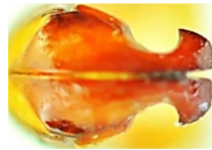
(Figs. 6-9)

Pseudohomonyx crassus Arrow, 1911: 159, pl. 5, fig. 6; Arrow 1937: 32 (catalogue); Endrődi 1985: 316, figs. 1220-1221 (parameres); Miyake & Yamaya 1997: 10, fig. 8a-b (parameres).

Type locality. N Borneo, Kina Balu, Labuan I., Sanga Sanga.

Type material. Holotype ♂ (BMNH).

Additional material. 1 ♂ (SJCP) labelled: MALAYSIA, Sabah/N BORNEO, Mt. Trus Madi/1200 m, V.2014/M. Sawai leg; 1 ♂ (SJCP) labelled: Indonesia, S Kalimantan prov./Kandangan reg., LOKSADO vill./17 km NE, 23.9.-15.10.97, Jákl leg; 1 ♀ (SJCP) labelled: Indonesia, S Kalimantan/17 km NE of LOKSADO/Kandangan distr., 3.-22.9./St. Jákl lgt, 1997 (new country record).



Figs. 6-13. *Pseudohomyx crassus* Arrow (6-9, length 22 mm) and *P. borneensis* Arrow (10-13, length 18 mm) males. 6, 10) Dorsal habitus. 7, 11) Heads and pronota. 8, 12) Aedeagi, dorsal views. 9, 13) Aedeagi, left lateral views.

Distribution. Malaysia: N Borneo, Kina Balu, Mt. Trus Madi, Labuan Island; Indonesia: SE Kalimantan, Loksado.

***Pseudohomonyx borneensis* Arrow, 1908**

(Figs. 10-13)

Pseudohomonyx borneensis Arrow, 1908: 327; Arrow 1937: 32 (catalogue); Endrődi 1985: 315, figs. 1216-1217 (parameres); Miyake & Yamaya 1997: 11, figs. 10, 12a-b (parameres), 20i (habitus).

Type locality. "BORNEO, Sarawak, Labuan I." (= Malaysia, Borneo, Sarawak). Specimen from Labuan Island (Sabah State) was later attributed by Arrow to *Pseudohomonyx crassus* Arrow, 1911.

Type material. Unknown number of syntypes collected by Alfred Wallace should be housed at BMNH.

Additional material. 1 ♂, 1 ♀ (SJCP) labelled: MALAYSIA, N BORNEO/MT. TRUS MADI, 1200 m/18.-21.IV.2011/M. Sawai leg; 2 ♂♂, 1 ♀ (SJCP) labelled: INDONESIA, Kalimantan Barat Pr./SW Kalimantan, 1000-1500 m alt./Singkawang reg., IV.2017/MT.BAWANG, Madi vill. env./local collectors leg (new country record).

Distribution. Malaysia: Borneo: Sarawak, Sabah; Indonesia: SW Kalimantan.

***Pseudohomonyx minor* sp. nov.**

(Figs. 14-18, 21-22)

Type locality. Indonesia, Sumatra Island, West Sumatra Province, Mt. Sanggul, Landai village env., 1250 m alt.

Type material. Holotype ♂ (SJCP) labelled: INDONESIA, West Sumatra Pr./MT. SANGGUL, 1250 m alt./Landai vill. env., cca 35 km N/Payakumbuh, IX.2010/St. Jákl leg; Paratypes Nos. 1-3 ♂♂ and 4-7 ♀♀ (SJCP) labelled: same as holotype; Paratypes Nos. 8-11 ♂♂ and 12-15 ♀♀ (SJCP) labelled: INDONESIA, W. Sumatra/MT. SANGGUL, Landai v. env./1200 m alt., 25 km N Payakumbuh/VIII.2010, St. Jákl leg.

Description of holotype. Body length 18.2 mm, maximum elytral width (in posterior half of elytra) 9.3 mm. Dark chestnut brown to blackish with paler sutural ridge.

Head. Frons and clypeus black, with simple and rather fine transverse striolation. Middle part with obtuse but very distinct and rather high carina separating clypeus and frons. Clypeus sharply narrowing to apex. Apical margin of clypeus straight. Lateral and apical margins of clypeus bordered. Antennae reddish to brown, club shorter than pedicel, reddish setation fine and short except on scape much longer and more abundant.

Pronotum. Moderately reflected, disc black, sides dark brown to blackish, wider than long, widest in posterior half. Anterior fourth with fine longitudinal midline, tubercle near anterior margin not developed. Anterior margin and sides bordered. Punctuation very fine and simple, uniformly developed throughout length. Posterolateral margins broadly rounded, anterolateral margins sharp. Setation absent.

Scutellum. Brownish, impunctate, wider than long, apex rounded.

Elytra. Widest in posterior third, brownish to brown/black, sutural ridge lighter. Each elytron with 8 longitudinally running puncture lines, inner lines deeper and more distinctly developed. Elytral intervals glabrous, moderately reflected. Elytral apex with denser and deeper punctuation, puncture diameters approximately as large as interspaces. Apical and humeral calli very obtuse. Sides bordered from base to posterolateral margins. Sutural ridge simple, moderately shining, impunctate, in posterior third slightly elevated.

Pygidium. Brownish, with fine and rather dense striolation uniformly developed throughout length. Lateral margins and apex with longer reddish setae.

Venter. Chestnut brown, with ginger to reddish setation on metasternum, prosternum and mentum. Abdomen almost impunctate except on lateral margins. Metasternum with very dense and rather deep punctation and dense cover of long reddish setae. Prosternum and mentum also with deep punctation, setation not as abundant as on metasternum.

Legs. Femora brownish to reddish, with long setation near anterior and posterior margins. Pro- and mesofemora also with setation on middle transverse line. Protibia reddish to brownish, tridentate, teeth blackish. Meso- and metatibiae short, robust, thickened, with setation especially on inner sides. Tarsi brownish, short, protarsi moderately thickened.

Aedeagus. No setation in apical part of parameres, terminal hooks very distinctly developed (Figs. 17 and 18).

Variability. Length 17.5-19.1 mm, in all other respects almost identical.

Sexual dimorphism. Female length 17.3-19.2 mm, slightly darker than males, transverse carina separating frons and clypeus less expressed and at middle usually interrupted. Punctation of pygidium weaker, especially at apex. Protarsi not thickened.

Differential diagnosis. The new species belongs to a group lacking any setation on paramere apices. Other species lacking such setation are *P. sumatrensis* (Sumatra), *P. javanus* (Java), and *P. borneensis* and *P. extradentatus* Miyake et Yamaya (Borneo). From *P. sumatrensis* can be distinguished by much smaller size, rounded lateral sides of mandibles, lack of impression and frontal tubercle in anterior pronotal margin, more rugose pygidial punctation, more robust and shorter meso- and metatibiae, and differently shaped parameres. From its congeners inhabiting Malaysian Borneo or Indonesian Kalimantan differs in: length only 17.2-19.2 mm; absence of pronotal impression and pronotal frontal tubercle; distinctly developed carina separating frons and clypeus; rounded lateral sides of mandibles; moderately thickened male protarsi; differently shaped parameres.

Etymology. Named for its size, distinctly smaller than its Sumatran congener.

Distribution. Indonesia: West Sumatra, Mt. Sanggul.

***Pseudohomonox javanus* (Burmeister, 1847)**

(Figs. 23-30)

Heteronoxchus javanus Burmeister, 1847: 98.

Pseudohomonox javanus (Burmeister): Arrow 1908: 326; Arrow 1937: 32 (catalogue); Endrődi 1985: 316, figs. 1222-1223 (parameres).

Pseudohomonox javanus javanus (Burmeister): Endrődi 1985: 317.

Heteronoxchus sumatrensis Fairmaire, 1896: 225; type locality "Sumatra, Palembang" (= INDONESIA, SE Sumatra, Palembang), Holotype male at MNHN.

Pseudohomonox sumatrensis (Fairmaire): Arrow 1908: 326; 1937: 32 (catalogue).

Pseudohomonox javanus sumatrensis (Fairmaire): Endrődi 1985: 317; **syn. nov.**

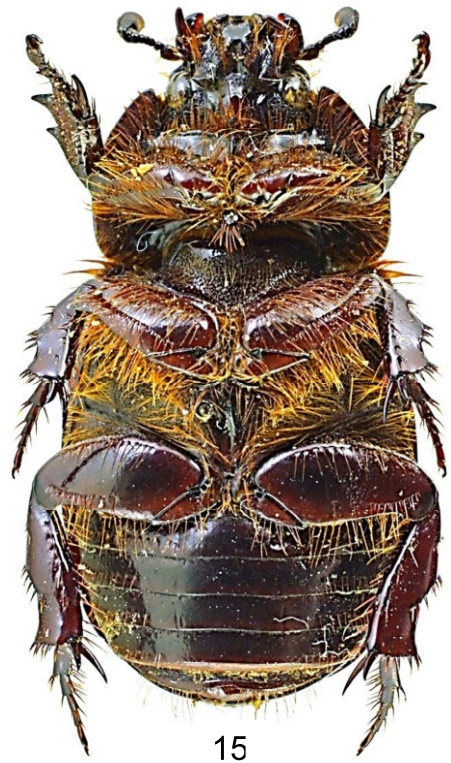
Type locality. Java.

Type material. Not traced.

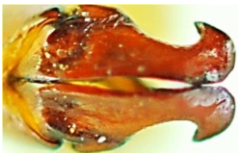
Additional material. 1 ♂ (SJCP) labelled: INDONESIA, E Java/MT. GUMITIR/XII.2017/Local collector leg; 1 ♂ (SJCP) labelled: INDONESIA, E Java/MT. SEMERU/III.2006/Local collector; 1 ♂ (SJCP) labelled: Indonesia, Central Java/MT.



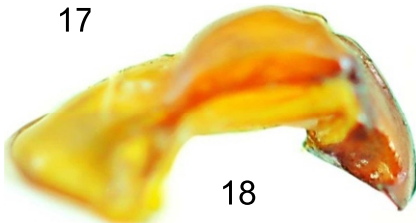
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Figs. 14-18. *Pseudohomonyx minor* sp. nov., holotype male, length 18.2 mm. 14) Dorsal habitus. 15) Ventral habitus. 16) Head and pronotum. 17) Aedeagus, dorsal view. 18) Aedeagus, left lateral view.

SUMBING, 6.2004/St. Jakl lgt; 2 ♂♂, 3 ♀♀ (SJCP) labelled: INDONESIA, West Sumatra Pr./MT. SANGGUL, 1200-1400 m/Landai vill. env., cca 35 km N/Payakumbuh, 9.IV.2015/St. Jákl leg; 1 ♂, 1 ♀ (SJCP) labelled: Indonesia, West Sumatra, 1250 M/MT. SANGGUL, Landai vill. env./3.2007, cca 30 km N of Payakumbuh/St. Jákl lgt; 2 ♂♂, 2 ♀♀ (SJCP) labelled: INDONESIA, W Sumatra/MT. SANGGUL, Landai v. env./1200 m alt., 25 km N Payakumbuh/VIII.2010, St. Jákl leg.

Distribution. Indonesia: Sumatra and Java.

Remarks. Examination of numerous specimens from Sumatra and Java has not revealed any morphological difference between the two populations (male parameres in both populations are slightly variable), and *P. javanus sumatrensis* (Fairmaire) thus is regarded as a junior synonym of *P. javanus javanus* (Burmeister). Endrődi's subspecific separation of the two populations was based only on size, probably due to an insufficient number of specimens examined.

The morphological homogeneity notwithstanding, such a model of distribution is quite unusual for insects occurring in the Sunda Islands. It is very uncommon that a Javanese species has a morphologically indistinguishable population in Sumatra and vice versa. It is the only case of such a distribution in Indomalayan Dynastinae. Usually there is at least a subspecific difference between the two islands, unless the species inhabits a much larger area than just Java and Sumatra.

***Pseudohomonix belitungensis* Miyake et Yamaya, 1997**

Pseudohomonix belitungensis Miyake & Yamaya, 1997: 10, figs. 7a-b (aedeagus), 20k (habitus).

Type locality. Belitung Island, east of Sumatra, Indonesia, IV.1996.

Type material. Holotype ♂ (NMSM) labelled: Belitung Island, east of Sumatra, Indonesia, IV.1996, native collector; Paratype ♂ (NMSM) labelled: same as holotype.

Additional material. None.

Distribution. Indonesia: Belitung Island.

Remarks. Female of this species is not known. Both males were probably collected at Mt. Tajam in the central part of the island (pers. comm. with local collectors).

***Pseudohomonix extradentatus* Miyake et Yamaya, 1997**

Pseudohomonix extradentatus Miyake & Yamaya, 1997: 12, figs. 9a-b (parameres), 20 (habitus).

Type locality. Keningau, Sabah, North Borneo.

Type material. Holotype ♂ (NMSM) labelled: Keningau, Sabah, North Borneo, III.1992, native collector; Paratypes: 2 ♂♂, 2 ♀♀ (NMSM) labelled: Kg. Tinompok near P.H.Q. Mt. Kinabalu Sabah, 2.-6.V.1995, H. MATSUDA leg; 1 ♂, 1 ♀ (NMSM) labelled: Polin, Sabah, Borneo, 4.V.1981, M. TAO leg; 1 ♂ (NMSM) labelled: Crocker Range (1000-1400 m alt.), near Keningau City, Sabah, 29.V.1981; 2 ♀♀ (NMSM) labelled: same as preceding but 15.V.1988.

Additional material. None.

Distribution. Malaysia: Sabah, Kina Balu Mts.

***Pseudohomonix similis* Miyake et Yamaya, 1999**

Pseudohomonix similis Miyake & Yamaya, 1999: 101, figs. 1a-b (parameres), 8 (habitus).



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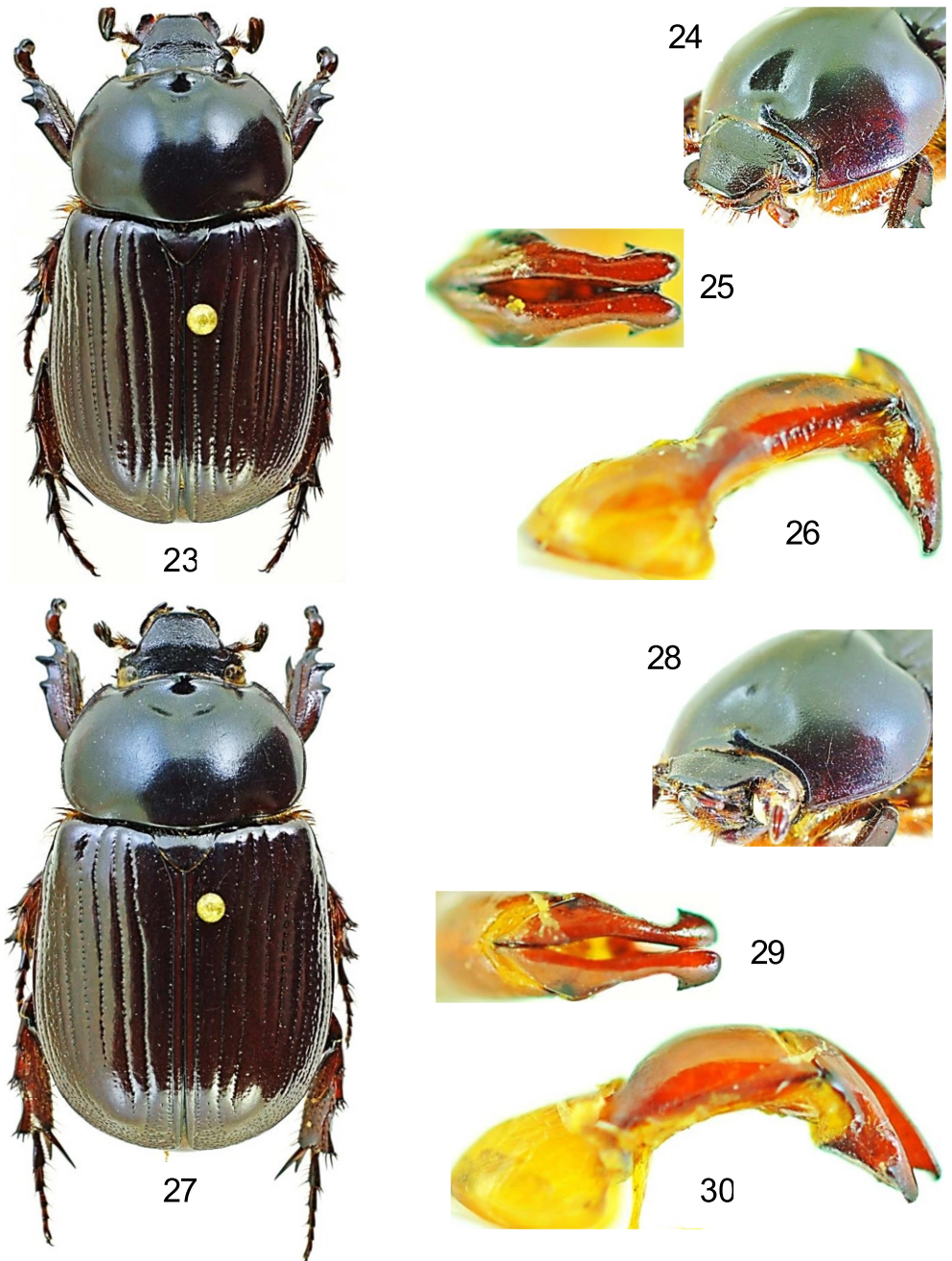


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Figs. 19-22. *Pseudohomonyx* spp. nov. females. 19-20) *P. loksadoensis*, length 22 mm, dorsal and ventral habitus. 21-22) *P. minor*, length 18 mm, dorsal and ventral habitus.



Figs. 23-30. *Pseudohomonyx javanus sumatrensis* (Fairmaire) (23-26, length 20 mm) and *P. javanus javanus* (Burmeister) (27-30, length 20 mm) males. 23, 27) Dorsal habitus. 24, 28) Heads and pronota. 25, 29) Aedeagi, dorsal views. 26, 30) Aedeagi, left lateral views.

Type locality. Mt. Tangga Saran, 400-900 m alt., S.W. Engkili, Sarawak, Borneo.

Type material. Holotype ♂ (NMSM) labelled: Mt. Tangga Saran, 400-900 m alt., S.W. Engkili, Sarawak, Borneo Is., Ill. 1992, native collector.

Additional material. None.

Distribution. Malaysia: Borneo, Sarawak.

Remarks. Female of this species is unknown.

ACKNOWLEDGEMENTS. Reviewers are thanked for critical reading and improving the manuscript.

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