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Revision of the genus *Parasyleter* Balkenohl, 2021 with the descriptions of four new species (Coleoptera: Carabidae: Clivinini)

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Abstract: The genus *Parasyleter* Balkenohl, 2021 is revised. For the type species *P. doriae* (Putzeys, 1873) a lectotype is designated in order to maintain stability of the nomenclature. The following new species are described: *P. perak* sp. nov., *P. kerdil* sp. nov., *P. rastellus* sp. nov., and *P. livaguensis* sp. nov. An identification key to the species is provided. The distribution records of the species are displayed on a map.

Keywords: Oriental region - taxonomy - lectotype designation - key to species.

INTRODUCTION

Recently, a complex Oriental species group formerly summarized in the genus *Syleter* Andrewes, 1941 was redefined with a split up into the three genera *Syleter* Andrewes, 1941, *Parasyleter* Balkenohl, 2021, and *Clypeuspinus* Balkenohl, 2021. In the same contribution the genera *Syleter* and *Clypeuspinus* were revised, and keys to the three genera and to the species of *Syleter* were provided (Balkenohl 2021). *Syleter* comprises six species and one subspecies whereas *Clypeuspinus* is a monotypic genus.

The genus *Parasyleter* consists of small sized species (1.8 to 2.4 mm) and some species show a significant reduction of the eyes and hind wings. Specimens are rarely represented in Museums and other collections, and if so there are often only one or few specimens available. Over ninety years ago, three species were described, *P. doriae* (Putzeys, 1873), *P. porphyreus* (Andrewes, 1923), and *P. malayicus* (Andrewes, 1927).

This contribution has the goal to revise the genus *Parasyleter,* to provide a key to the species, and to summarize the distribution.

MATERIAL AND METHODS

Terms, descriptions of characters, methods, microscopy and photographs are described in Balkenohl (2021).

For the revision 59 specimens including types and other material were investigated. In general, all additional informative material like original paper cards and pins have been kept at the specimens. The collecting information of the examined specimens like date, locality and collector is cited as given on the original labels. For the descriptions, the length was measured from the most anteriorly projecting part of the head (clypeus at middle or clypeal wings) and does not include the elongated mandibles. The length of the pronotum was measured along the median line and includes the posteriorly elongated flange. The width of the pronotum and elytra was measured at the maximum width. The description of the genitalia refers to the natural position the genitalia exhibit in soaked specimens before they are extracted, cleaned, and mounted.

For the species described already, an extended diagnosis is provided to include additional data and to clearly discriminate the species.

Abbreviations used:

ADCW	Alexander Dostal collection (including Coll. Karel Kult), Vienna, Austria
BMNH	Natural History Museum, London, United Kingdom
MBCB	Michael Balkenohl working collection, Bonstetten, Switzerland
MFNB	Museum für Naturkunde Berlin, Germany
NHMW	Naturhistorisches Museum, Wien, Austria
MHNG	Muséum d'histoire naturelle, Genève, Switzerland
MNHN	Muséum national d'Histoire naturelle, Paris, France
PBCP	Petr Bulirsch Collection, Prague, Czech Republic

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RBINS	Royal Belgian Institute of Natural Sciences, Brussels, Belgium
SMNS	Staatliches Museum für Naturkunde, Stuttgart, Germany
[…]	in brackets: additional information by the author
/	slash: separates different labels or values under measurements
$\overline{x}$	arithmetic mean (used in the measurements for the descriptive statistics)

TAXONOMY

Order Coleoptera
Family Carabidae Latreille, 1802
Subfamily Scaritinae Bonelli, 1810
Tribe Clivinini Rafinesque, 1815
Genus *Parasyleter* Balkenohl, 2021

Parasyleter Balkenohl, 2021: 358.

Type species: *Dyschirius doriae* Putzeys, 1873: 14.

Genus diagnosis: *Size* 1.8 to 2.3 mm. *Head* with clypeus and frons distinctly elongated and flattened anteriorly; clypeus and clypeal wing fused, delimitation between clypeal wing and supraantennal plate observable as indistinct obtuse notch in two of the species; clypeus straight or slightly convex anteriorly, as far as or slightly more projecting than clypeal wing; mandible elongate, narrow in apical third, laterally nearly straight or convex, hooked at apical tip; labrum five- or seven-setose; maxillary palpomere distinctly narrowed and slender towards apex, nearly straight, two apical segments securiform; antenna with scapus and pedicellus eccentrically attached; eye without or with distinct reduction, gena small or extended posteriorly. Mentum not elongated, with lateral lobe convex, median tooth as wide as lateral lobe, acute, distinctly more projecting than lateral lobe, surface with slight transverse rugae. *Pronotum* square or indistinctly trapezoid, with reflexed lateral margin incomplete, running from anterior angle up to posterior setigerous puncture, posterior angle rounded off without tooth, lateral channel of equal width, median line narrow, finely or just not joining basal constriction; proepisternum visible basally in dorsal view; flange at base convex, as narrow as or up to two times as wide as basal constriction. *Elytron* with interval eight convex, lateral channel distinctly flared apically, with interval eight distinctly emarginated apically and row of umbilical setigerous punctures distinctly following the emargination, interval eight with distinct emarginated carina at apex; third interval without setigerous punctures. *Hind wings* fully developed or reduced. *Legs* with front and intermediate tarsomeres slightly widened, more distinct in males; mesotibia with four setae laterally, preapical seta either without any protuberance or arising from minute tubercle. *Male genitalia* with aedeagus distinctly curved, apical part elongated, apex more or less spatulate or securiform. *Female genitalia* with gonocoxite one and two completely fused, with evident cone-like seta in apical third; laterotergite with isolated setae.

Differential diagnosis: See key to the genera in Balkenohl (2021).

Parasyleter doriae (Putzeys, 1873)
Figs 1, 2, 9, 10, 16, 20

Dyschirius doriae Putzeys, 1873: 14.
Dyschirius doriae. – Csiki, 1927: 525. – Csiki, 1933: 639.
Psilus doriae. – Andrewes, 1927: 267. – Andrewes, 1930: 287.
Syleter doriai. – Jeannel, 1957: 138.
Syleter doriai. – Lorenz, 1998: 138. – Lorenz, 2005: 148.
Syleter doriae. – Balkenohl, 2001: 30, fig. 40. – Balkenohl, 2021: 369, with 5 figs.

Type material examined: *Lectotype* by present designation: RBINS; ♂, with labels and data: grey, black framed, handwritten in black ink "Borneo Sarawak 1865-66. Coll. G. Doria", and backside "Kantu" / grey, handwritten in black ink and printed "Dyschirius doriae PUTZ. dét. J. Putzeys" / grey, black framed and black printed "Soc.Ent.Belg. Coll. Putzeys" / white, black framed, red printed "Syntype".
Paralectotypes by present designation: RBINS; 1 ♂, 2 specs., same data as lectotype, one with additional white label and handwritten in black ink and printed "Psilus doriae Putz. Cotype H.E.Andrewes det. 1928". – MFNB; 1 ♂, with labels and data: grey, black framed, handwritten in black ink "Borneo Sarawak 1865-66. Coll. G. Doria", and backside "Kantu" [same as lectotype] / grey, printed "160" / white, printed "61302" / white, printed "Zool. Mus. Berlin" / yellow, handwritten in black ink "Doriae Putz.". – BMNH; 1 ♂, with labels and data: grey, black framed, handwritten in black ink "Borneo Sarawak 1865-66. Coll. G. Doria", and backside "Kantu" [same as lectotype] / white, handwritten in black ink "Ex Mus. Civ. Genova" / handwritten in black ink and printed "Psilus doriae Putz. Compared with Cotype H.E.A." [H.E.Andrewes]. – MNHN; 1 ♂, same data as the last one.

Additional material: MFNB; 1 ♀, Sarawak / Dyschirius Doriae / Coll. L.W. Schaufuss / Zool. Mus. Berlin. – MFNB; 1 ♀, S.O. Borneo Grabowsky. / Zool. Mus. Berlin. – ADCW; 1 ♀, INDONESIEN: Kalimantan Timur, Tanjung Isuy 20.1.1995 leg. Seyfert & Greindl (33) / Coll. Zettel Wien. – BMNH; 1 ♀, Borneo Ban…. [not readable] / 56237 / Fry Coll. 1905.100. / Psilus doriae Putz. Compared with type H.E.A. [found glued]. – ADCW; 2 ♂, 8 ♀, S Thailand, Betong Gunung Cang dun vill. Yala dist., 25.3.-22.4.1993 J. Horák leg.". – NHMW; 2 ♀, same data as

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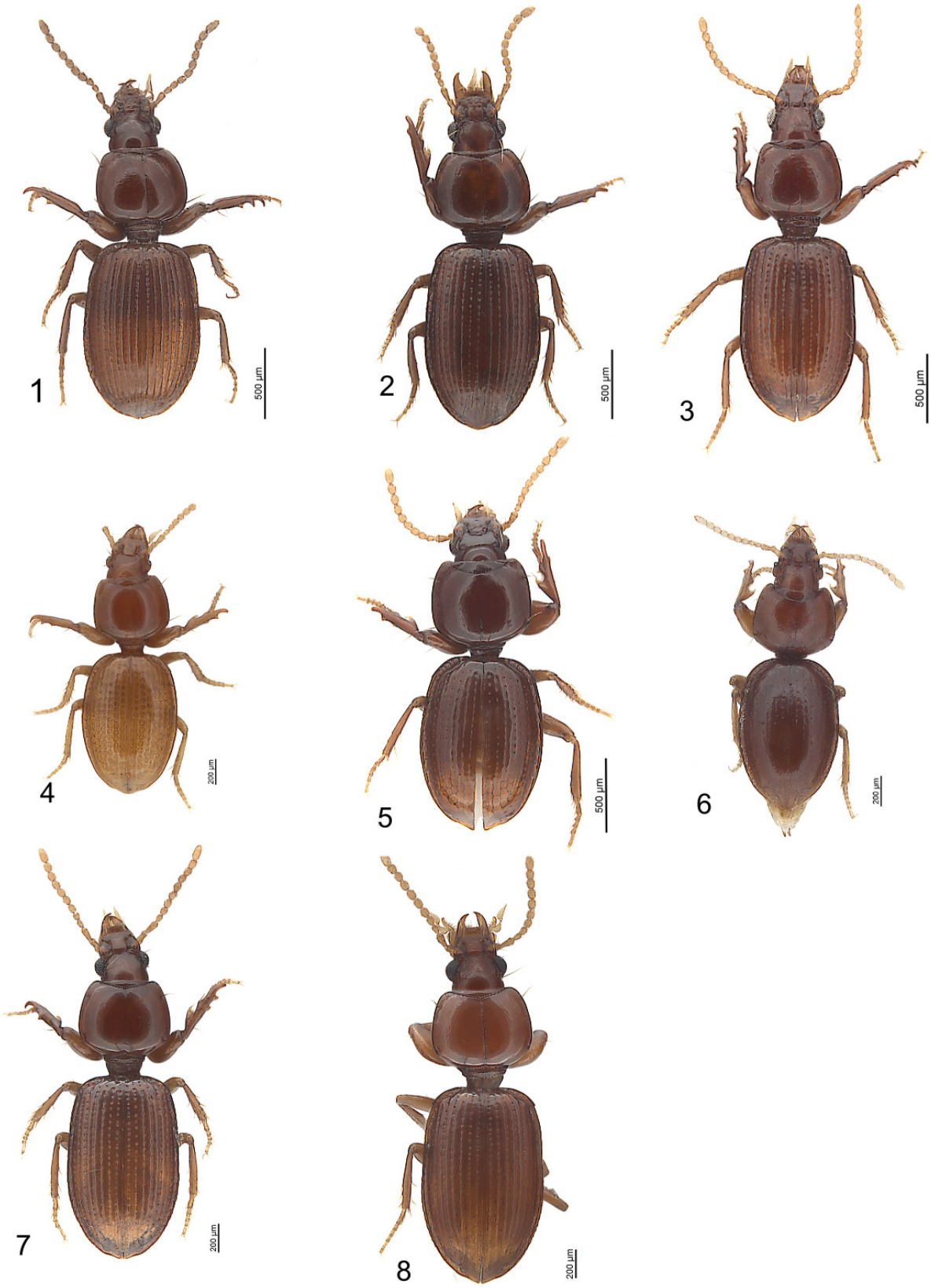
Identification key to the species of the genus *Parasyleter*

1A Eye conspicuously reduced, consisting of few ommatidida, surrounded by a distinct ring of dark pigment; gena large, projecting laterally as high as eye; species without hind wings 2
1B Eye convex, consisting of numerous ommatidida; gena small; species with or with conspicuously reduced hind wings 4
2A Outline of elytron regularly ovate; eye projecting anteriorly; gena 2.5-3 three times as long as eye; elytron with intervals flattened, punctures of striae slightly deepened, distinctly shortened apically, striae one and two free at base; colour testaceous to rufous; body length 1.8 mm. West Malaysia: Lake Kenyir ..... ***kerdil*** sp. nov.
2B Outline of elytron oval but wider at humeri and apically; eye directed anterio-laterally; gena 1.5 or 2 three times as long as eye; elytron with intervals slightly convex, punctures of striae deepened, reaching the apical fifth, striae one to three free at base; colour fulvous or piceous; body length more than 1.9 mm 3
3A Pronotum conspicuously square, median line shallow; colour piceous; elytron with punctures of striae moderately deep; interval eight of elytron wider as seven; body length 2.1-2.2 mm. West Malaysia: Perak ..... ***perak*** sp. nov.
3B Pronotum sub-trapezoid, median line distinct; colour fulvous; elytron with punctures of striae deepened; interval eight of elytron as wide as seven. Body length 1.9 mm. West Malaysia: Island of Penang ..... ***malayicus***
4A Labrum 7-setose; lateral margin of elytron smooth; outline of pronotum longitudinal sub-trapezoid; wings of clypeus slightly projecting anteriorly; male aedeagus slightly curved. Body length 2.4 mm. Sri Lanka, southwestern provinces..... ***porphyreus***
4B Labrum 5-setose; lateral margin of elytron serrulate; outline of pronotum globose to sub-trapezoid; wings of clypeus as projecting as clypeus 5
5A Serrulation at the lateral margin of the elytron in anterior half nearly invisible; lateral margin and channel of pronotum narrower at middle, disk laterally with longitudinal group of small punctures. Body length 2.3-2.6 mm. Malaysia, Sabah ..... ***livaguensis*** sp. nov.
5B Serrulation at the lateral margin of the elytron well visible in anterior half; lateral margin and channel of pronotum of same width from anterior to posterior setigerous puncture, disk smooth 6
6A Clypeal field U-shaped, covered with isodiametric reticulation, with transverse clypeal furrow in form of a flattened letter V; labrum concave; lateral margin of elytron indistinctly convex and diverging. Male aedeagus at apex with elongated spatula. Body length 2.1-2.5 mm. Borneo, Malay Peninsula, Sumatra ..... ***doriae***
6B Clypeal field square, smooth, with transverse clypeal furrow straight; labrum straight; lateral margin of elytron straight in anterior half but diverging. Male aedeagus at apex with short flattened hoe. Body length 2.2-2.4 mm. Laos, Cambodia, South of Vietnam ..... ***rastellus*** sp. nov.

the last one. – PBCP; 3 ♀, same data as the last one. – PBCP; 1 ♀, same data but 4-93 leg. Strnad. – PBCP; 1 ♀, MALAYSIA; JAHOR; 50-400m; Endau-Rompin; 19.iii.1998; Pulau Jasin; 2,31N 103,21 E / backside leg. Hauk. – NHMG; 2 ♂, 1 ♀, MALAYSIE Pahang Temerloh 9. III. 77 T. Jaccoud. – NHMG, MBCB; 1 ♂, 1 ♀, Malaisie Selangor Kuala Lumpur 25.8.69 R. Pilet Plantation d'Heveas. – MNHN; 1 spec., Sumatra Palembang / Dr. Forster / Syleter doriae Putz. [glued spec. in desolate condition with separately mounted but empty hind body].

Extended diagnosis: *Head* anterior eyes distinctly elongated, with impressed transverse clypeal furrow in form of a flattened letter V and with few rugae laterally; clypeal field U-shaped, covered with indistinct isodiametric reticulation, separated from anterior margin of clypeus by distinctly isodiametric reticulated flat area, fused with clypeal wings, straight anteriorly, with indistinct obtuse notch to supraantennal plates; supraantennal plates keeled; frontal furrows moderately deep; frons smooth, with small circular pore, laterally with tubercle-like longitudinal carinae; neck constriction developed laterally as row of few punctures, with wide gap at middle; labrum slightly concave, five-setose; mandible distinctly elongated; eye somewhat reduced but still of moderate size in lateral view, somewhat flattened in dorsal view, slightly surrounded by dark pigment; gena small. *Pronotum* sub-trapezoid to globose, slightly wider than long, slightly narrowed in anterior half, posterior angle completely rounded off; reflexed lateral margin ending at posterior setigerous puncture; flange convex, two times as wide as basal constriction; disk smooth, median line narrow, joining with anterior transverse line and finely with basal constriction as line of dark pigment. *Elytron* nearly 1.5 times longer than wide, with indistinctly convex but slightly diverging margin anterior middle, maximum width slightly posterior middle of elytron; humerus well visible; reflexed lateral margin serrulate from sharp humeral tooth nearly up to apex; interval eight slightly wider than seven; striae distinctly punctate, profound; lateral channel somewhat narrower at middle with umbilical setigerous punctures of equal distance, at apex conspicuously widened by

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Figs 1-8. *Parasyleter* spp., habitus. (1) *P. doriae* (Putzeys, 1873), paralectotype, from Sarawak, male. (2) *P. doriae,* male specimen from Betong Gunung, South of Thailand. (3) *P. porphyreus* (Andrewes, 1923), holotype, female. (4) *P. malayicus* (Andrewes, 1927), holotype, male. (5) *P. perak* sp. nov., holotype, male. (6) *P. kerdil* sp. nov., holotype, female. (7) *P. rastellus* sp. nov., holotype, male. (8) *P. livaguensis* sp. nov., holotype, male.

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emargination of interval eight which is costate apically. *Hind wings* see variability. *Legs* with protarsomeres slightly widened in both sexes. *Male genitalia* (Figs 9, 10) with aedeagus in ventral view slightly curved in basal half, distinctly curved and elongated apically, at apex with conspicuously elongated flattened spatula; in lateral view widened at middle, apical spatula distorted, turned ventrally, widened to tip, internal sac at middle with bunch of bristles, antero-laterally with eight large longitudinal spines; ventral paramere oval, wide, slightly acuminated at tip, both parameres asetose. *Female genitalia* (Fig. 6) with gonocoxites regularly curved to apex, robust in apical half, base stout; with moderately sized cone-like seta anterior middle, ventro-medially with eight nematiform setae; laterotergite with three moderately long nematiform setae. *Measurements.* Body length 2.16-2.48 mm ($\overline{x}$: = 2.28 mm*), width 0.81-0.85 mm ($\overline{x}$: = 0.82 mm*), ratio length/width of pronotum 0.86-0.9 ($\overline{x}$: = 0.88*), ratio length/width of elytra 1.53-1.62 ($\overline{x}$: = 1.58*); (*n = 12).

Variability: The pore on the frons of head is more or less distinctly developed. The reticulation on the clypeal field is more or less distinct, the furrow separating the clypeus from frons is more or less impressed. Specimens from West Malaysia have the labrum more straight. Specimens from Borneo seem to have slightly less elongated elytra. Some specimens from Borneo show reduced hind wings. This character was not observed in specimens from West Malaysia. It is hypothesized that wing dimorphism is present in some populations.

Distribution: Known to be distributed on Borneo, the Malay Peninsula from the South of Thailand to the South of the Peninsula, and from Sumatra (Fig. 20).

Type locality: Borneo, Sarawak.

Remarks: In his half-page quite correct description, Putzeys (1873) did not mention on how many specimens he based the description on. It is also unclear to which collections specimens were distributed. However, the investigated seven specimens show identical labels with the same handwriting and kind of mounting. Therefore, these specimens are regarded to be part of the type series.

Andrewes reports the 'type' of *doriae* "should be" in the museum of Genova but is missing there, but a 'cotype' is at Brussels (Andrewes 1926, p. 378). Five of the seven 'syntypes' were located in RBINS, one in the BMNH and in the MNHN, each.

The species was described as *Dyschirius doriae* Putzeys (Putzeys 1873) and transferred into the genus *Psilus* Putzeys by Andrewes (1927). Later, Andrewes (1941) renamed *Psilus* into *Syleter* due to preoccupation. The species is listed as *doriae* in Csiki (1927: 525, 1933: 639), Andrewes (1930: 287), and Balkenohl, 2001: 31. However, in Jeannel (1957: 138), and Lorenz (1998: 138, 2005: 148) it is listed as 'doriai*'*.

Dyschirius, Psilus, and *Syleter* are masculine genus names. The description in Putzeys (1873) clearly indicates the species was delivered by M. le marquis Doria. In the same volume it is mentioned Marquis Doria was the director of the Museo civico di Storia naturali - Gènes (p. CLXXI). Therefore, the dedication to Marquis Giacomo Doria is verified and not to a woman with the name of 'Doria' is intended. This would lead to the assumption the name is not correctly formed according to the conditions of ICZN Article 31.1.2. (1999). However, the name is not an adjective but a substantive in the genitive case and remain therefore independent from the grammar form of the genus. According to Article 32.2., only those original names have to be corrected which are listed in Article 32.5. A reference to cases like "*doriae*" is not listed. Therefore, I am using the name as it is originally published.

Jeannel (1957), who still regarded all species of *Syleter* from the Oriental and Ethiopian region in one genus, provided an ink sketch of the male aedeagus from a *S. doriae* specimen from Sumatra. However, the drawing more resembles to the aedeagus of a *S. paradoxus* specimen (Jeannel, 1957, p. 138, fig. 8).

***Parasyleter porphyreus* (Andrewes, 1923)**

Figs 3, 11, 17, 20

Psilus porphyreus Andrewes, 1923: 227. – Andrewes, 1927: 267. – Andrewes, 1928: 178. – Andrewes, 1929: 389. – Andrewes, 1930: 288.

Psilus porphyreus. – Csiki, 1927: 496.

Syleter porphyreus. – Lorenz, 1998: 138. – Lorenz, 2005: 148.

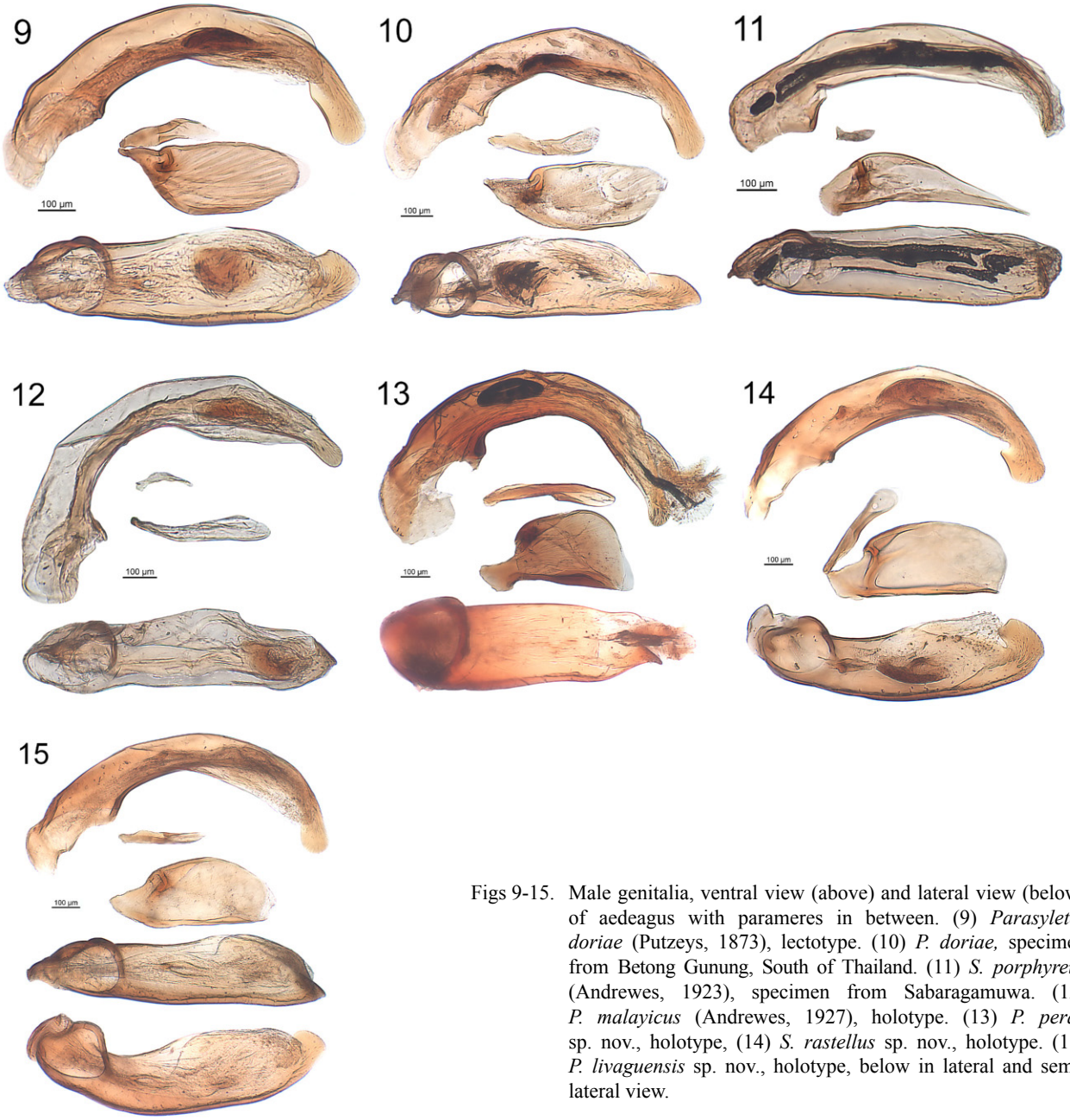
Syleter porphyreus. – Balkenohl, 2001: 30. – Balkenohl, 2021: 369.

Type material examined: *Holotype*: BMNH; ♀, with labels and data: white, handwritten in black ink "Kotte Ceylon 4-IV-21" / Ceylon 1922 . 215" / handwritten and printed in black ink "Psilus porphyreus Andr. Type H.E.Andrewes det." / circle, red framed, black printed "Type H.T.".

Additional material: MNHN; 1 ♀, Galle E. Simon 1892 / MUSEUM PARIS Ex Coll. M. MAINDRON Coll. G. BABAULT 1930 / handwritten Clivina fulvaster Mots. – NHMG; 2 ♂, 2 ♀, 1 spec., CEYLAN Sabaragamuwa Ratanapura 21.I.70 MUSSARD BESUCHET LÖBL. – MNHN; 1 ♀, Colombo Simon 1892 / MUSEUM PARIS Ex Coll. M. MAINDRON Coll. G. BABAULT 1930. – MFNB; 4 specs., Ceylon Nietner / 4153 / Zool- Mus. Berlin.

Extended diagnosis: *Head* anterior eyes conspicuously elongated, with impressed straight transverse clypeal furrow, clypeus completely covered with isodiametric reticulation, fused with clypeal wings, straight anteriorly, laterally slightly more projecting as clypeus; supraantennal plates keeled, smooth, frontal furrows

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Figs 9-15. Male genitalia, ventral view (above) and lateral view (below) of aedeagus with parameres in between. (9) *Parasyleter doriae* (Putzeys, 1873), lectotype. (10) *P. doriae,* specimen from Betong Gunung, South of Thailand. (11) *S. porphyreus* (Andrewes, 1923), specimen from Sabaragamuwa. (12) *P. malayicus* (Andrewes, 1927), holotype. (13) *P. perak* sp. nov., holotype, (14) *S. rastellus* sp. nov., holotype. (15) *P. livaguensis* sp. nov., holotype, below in lateral and semi-lateral view.

deep, frons isodiametrically reticulated, supraorbital furrows wide, distinctly diverging posteriorly; neck constriction visible laterally as row of few punctures, with wide gap at middle; labrum slightly concave, seven-setose; mandible distinctly elongated; eye convex, of regular size in lateral view, somewhat flattened in dorsal view; gena small. *Pronotum* sub-trapezoid, convex, as wide as long, slightly narrowed in anterior half; reflexed lateral margin ending at posterior setigerous puncture; posterior angle completely rounded off; flange convex, two times as wide as basal constriction; disk smooth, median line narrow, joining with anterior transverse line and finely with basal constriction. *Elytron* elongated, more than 1.5 times longer than wide, with nearly straight margin anterior at middle, maximum width at middle; humerus distinct, reflexed lateral margin smooth, with small humeral tooth, interval eight slightly wider than seven; striae distinctly punctate-striate; lateral channel somewhat narrower at middle, row of umbilical setigerous punctures with small gap at middle; lateral margin at apex conspicuously widened by emargination of interval eight. *Hind wings* well developed. *Legs* with protarsomeres slightly widened in both sexes. *Male genitalia* (Fig. 11) with aedeagus in ventral view slightly curved in its whole length, distinctly curved directly at apex, at apex with distorted short and rounded lamella; in lateral view straight; parameres

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asetose. *Female genitalia* (Fig. 17) with gonocoxite distinctly curved to apex, with small hook at apex; with moderately sized cone-like seta at beginning of apical third, ventro-medially with thirteen nematiform setae; laterotergite with four moderately long nematiform setae. *Measurements*. Body length 2.29-2.61 mm ($\overline{x}$: = 2.43 mm*), width 0.82-0.9 mm ($\overline{x}$: = 0.85 mm*), ratio length/width of pronotum 0.95-1.01 ($\overline{x}$: = 0.97*), ratio length/width of elytra 1.53-1.55 ($\overline{x}$: = 1.54*); (*n = 10).
Variability: The median line of the pronotum is just not joining the basal constriction in the holotype. In some of the other material it finely joins the basal constriction.

Distribution: Southwest of Sri Lanka (Fig. 20).

Type locality: Kotte, Sri Lanka.

Remark: Andrewes (1923) described and redescribed (1929) the species. The description is based on the single holotype.

Parasyleter malayicus (Andrewes, 1927)

Figs 4, 12, 20

Psilus malayicus Andrewes, 1927: 267. – Andrewes, 1930: 288.
Psilus malayicus. – Csiki, 1933: 638.
Syleter malayicus. – Lorenz, 1998: 138. – Lorenz, 2005: 148.
Syleter malayicus. – Balkenohl, 2001: 30. – Balkenohl, 2021: 369.

Type material examined: *Holotype*: BMNH; ♂, with labels and data: white, printed in black, yellow underlined and handwritten "Penang, G.E.Bryant. X 1913." / red, printed "Type" / white, handwritten and printed "Psilus malayicus Type Andr. H.E.Andrewes det." / "H.E.Andrewes Coll. B.M.1945-97.".

Extended diagnosis: *Head* anterior eyes distinctly elongated, with distinctly impressed straight transverse clypeal furrow; clypeal field at middle sub-rectangular, separated from wide frontal furrows by carinae, with distinct regular isodiametric reticulation, clypeal wing with irregular reticulation, slightly projecting anteriorly; supraantennal plate nearly smooth, keeled posteriorly up to end of gena-level; frons with fine not very regular isodiametric reticulation, laterally with elongated tubercle; neck constriction not visible; labrum concave, seven-setose; mandible distinctly elongated; eye conspicuously reduced, shape circular, directed antero-laterally, surrounded by dark pigment, pointed anteriorly; gena two times as long as eye, as high as eye. *Pronotum* sub-trapezoid, slightly wider than long, slightly narrowed in anterior half, posterior angle obtuse, just traceable; reflexed lateral margin just running over posterior setigerous puncture; basal constriction narrow, flange convex, two times as wide as basal constriction; disk smooth, median line narrow, joining with anterior transverse line, just not joining basal constriction. *Elytron* oval, 1.4 times longer than wide, maximum width at middle; reflexed lateral margin nearly smooth, sub-serrulate, humeral tooth small, just visible, situated posteriorly, slightly convex; interval eight as wide as seventh; striae distinctly punctate, punctures slightly to moderately impressed, distinctly shortened to base, stria one reaching apex, all others shortened apically; lateral channel with umbilical setigerous punctures of equal distance; lateral margin at apex conspicuously widened by emargination of interval eight. *Hind wings* not visible. *Legs* with protarsomeres slightly widened. *Male genitalia* (Fig. 12) with aedeagus in ventral view distinctly curved in basal two-thirds, thickened in apical third, at apex with elongated distorted spatula; in lateral view nearly straight; parameres small, asetose. *Female genitalia* unknown. *Measurements.* Body length 1.92 mm, width 0.74, ratio length/width of pronotum 0.92, ratio length/width of elytra 1.41.
Variability: Unknown.

Distribution: Known from the type locality, the island of Penang in West Malaysia (Fig. 20).

Type locality: Penang, West Malaysia.

Remark: According to the description, there is no other type material available. The species is well described by Andrewes (1927).

Parasyleter perak sp. nov.

Figs 5, 13, 20

Holotype: NHMG; ♂, with labels and data: white, black printed and handwritten "MALAISIE Perak Maxwell Hill T. Jaccoud 8. IX. 72", backside handwritten " Mal-72/9" / white, printed " Syleter nr. malayicus ANDR. det. Balkenohl X.94".

Paratype: MBCB; ♂, same data as holotype.

Diagnosis: A small sized species with five-setose labrum, the clypeus and frons isodiametrically reticulated, and distinctly reduced eyes. Differentiated mainly from the other two species with reduced eyes (*P. malayicus* and *P. kerdil* sp. nov.) by the conspicuously square pronotum, and the shape of the eyes which are long-ovoid dorso-ventrally.

Etymology: The name is a noun and refers to the type locality of the species, Perak in West Malaysia.

Description:
Measurements: Body length 2.11 / 2.18 mm, width 0.81 / 0.81 mm, ratio length/width of pronotum 0.91 / 0.90, ratio length/width of elytra 1.46 / 1.45.
Colour: Piceous, with rufous tinge. Antenna, palpi, and legs flavous. Supraantennal plate and wing of clypeus translucent laterally.
Head: Distinctly narrower than a third of pronotum, frons and clypeus anterior eye-level distinctly elongated.

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Clypeus indistinctly convex anteriorly, with lateral angle obtuse rounded and slightly projecting, fused with clypeal wing and supraantennal plate, all reflexed margined, clypeus flattened, separated from elongated convex supraantennal plate by parallel running deep and wide clypeal furrows, extending up to anterior eye-level; supraantennal plate keeled, extended over eye-level to posterior end of gena-level; clypeus separated from frons by a distinct transverse furrow. Frons slightly convex, supraorbital furrow wide. Clypeal, frontal, and supraorbital furrow connected. Clypeus and frons with indistinct isodiametric reticulation; supraantennal plate smooth, with small depression posteriorly. Neck with slight constriction laterally. Eye conspicuously reduced, shape long-ovoid dorso-ventrally in lateral view, surrounded by dark pigment, directed anterio-laterally, gena one and a half times as long as eye, about as high as eye. Antenna reaching distinctly over posterior setigerous puncture of pronotum, antennomeres five to ten elongated (around 1.4 times longer than wide). Labrum distinctly convex anteriorly, irregularly reticulated, five-setose, the central and the two lateral setae robust, the intermediate ones indistinct.

Pronotum: Disk in lateral view slightly convex, moderately convex in frontal view but slightly flattened laterally. Outline conspicuously square, slightly wider than long, widest at middle. Reflexed lateral margin smooth, running over posterior setigerous puncture by diameter of pore; anterior angle slightly projecting; posterior angle rounded off. Lateral channel narrow, as wide as reflexed lateral margin, marginal setigerous punctures located in the channel. Median line narrow, anteriorly evanescent, not joining anterior transverse line, joining indistinctly basal constriction; anterior transverse line wider than median line. Surface smooth, laterally with indistinct irregular reticulation; basal constriction narrow, flange short.

Elytron: Disk regularly convex in lateral and frontal view. Oval, around 1.5 times longer than wide, maximum width at middle. Reflexed lateral margin subserrulated, humeral tooth sharp, small, situated posteriorly; intervals slightly convex, eighth as wide as seventh; striae punctate-striate, punctures slightly to moderately impressed, shortened at base, stria one reaching apex, all others shortened apically; lateral channel with umbilical setigerous punctures of equal distance; lateral margin at apex conspicuously widened by emargination of interval eight.

Hind wings: Not visible.

Dorsal surface: Proepisternum smooth. Sternites of abdomen slightly transversely sulcate, smooth.

Legs: Protibia sulcate, smooth, with apical spine moderately arcuate, the two lateral spines obtuse and small, movable spur regularly arcuate.

Male genitalia (Fig. 13): Aedeagus in ventral view with long basal opening, distinctly curved at middle by about 110°, at apex with short, turned and distorted spatula, in lateral view nearly straight, apical tip turned dorsally; dorsal paramere elongated, ventral one wide, both asetose.

Female genitalia: Unknown.

Variability: In the paratype, the clypeal field is somewhat depressed.

Distribution: Known from the type locality Perak in West Malaysia (Fig. 20).

***Parasyleter kerdil* sp. nov.**

Figs 6, 18, 20

Holotype: SMNS; ♀, with labels and data: white, black printed "W-MALAYSIA: Lake Kenyir, 5 km SW dam, 50 km SW Kuala Terengganu, ~350 m, 7.-12.VII.2001, leg. A.SCHULZ & K.VOCK".

Diagnosis: A very small sized species with five-setose labrum, the clypeus and frons isodiametrically reticulated, and distinctly reduced eyes. Differentiated mainly from the other two species with reduced eyes (*P. malayicus* and *P. perak* sp. nov.) by the very small body size, and the elytra with flattened intervals, less impressed and apically shortened punctures and striae. Moreover it is the only species with striae one and two free at the base of the elytron.

Etymology: The name is a noun and derived from the Malaysian language. The masculine word for dwarf is Kerdil and refers to the very small body size of the species.

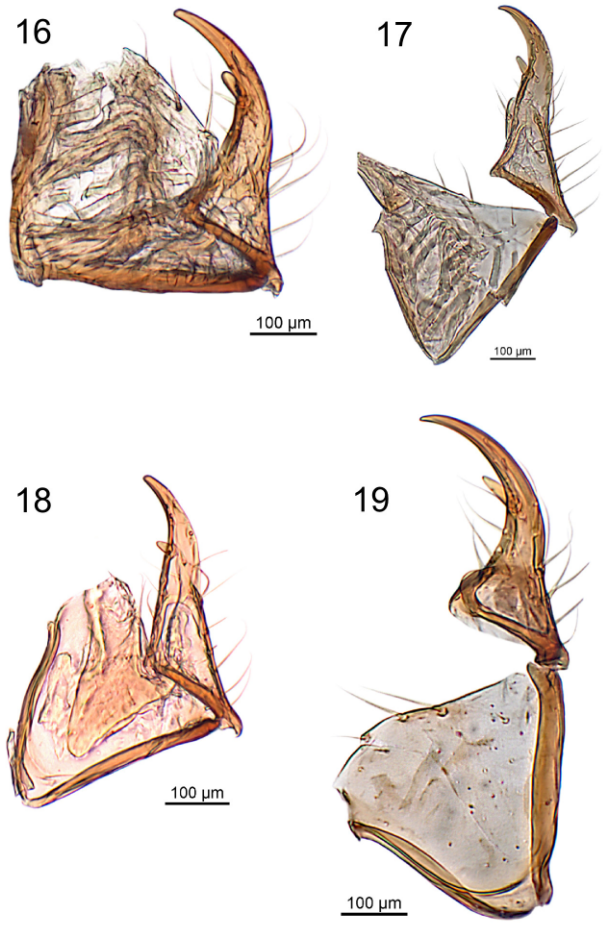
Description:

Measurements: Body length 1.8 mm, width 0.66 mm, ratio length/width of pronotum 0.86, ratio length/width of elytra 1.51.

Colour: Testaceous to rufous. Antenna, palpi, and legs flavous. Supraantennal plate and wing of clypeus translucent laterally.

Head: Distinctly narrower than a third of pronotum, frons and clypeus anterior eye-level distinctly elongated. Clypeus slightly convex anteriorly, with lateral angle obtuse rounded, fused with clypeal wing and supraantennal plate, all reflexed margined, clypeus with U-shaped blunt carina, slightly hollowed out at middle, separated from elongated convex supraantennal plate by parallel running deep and wide clypeal furrows, extending up to eye-level*;* supraantennal plate keeled, extended over eye-level to posterior end of gena-level; clypeus separated from frons by the bottom of the U-shaped carina. Frons slightly convex, supraorbital furrow wide. Clypeal and supraorbital furrow connected. Clypeus, frons and supraantennal plate with indistinct isodiametric reticulation; supraantennal plate with longitudinal depression posteriorly. Neck constriction not present. Eye conspicuously reduced, convex, nearly circular in lateral view, surrounded by dark pigment,

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Figs 16-19. Female gonocoxites with laterotergite. (16) *Parasyleter doriae* (Putzeys, 1873), specimen from Sarawak. (17) *P. porphyreus* (Andrewes, 1923), holotype. (18) *P. kerdil* sp. nov., holotype. (19) *P. rastellus* sp. nov., paratype.

projecting distinctly anteriorly, gena two and a half times as long as eye, about as high as eye. Antenna reaching distinctly over posterior setigerous puncture of pronotum, antennomeres five to ten elongated (around 1.5 times longer than wide). Labrum distinctly convex anteriorly, irregularly reticulated, five-setose.

Pronotum: Disk in lateral view slightly convex, moderately convex in frontal view. Outline sub-trapezoid, wider than long, widest in posterior third. Reflexed lateral margin smooth, running over posterior setigerous puncture by two diameters of pore; anterior angle slightly projecting; posterior angle rounded off. Lateral channel narrow, as wide as reflexed lateral margin, marginal setigerous punctures located in the channel. Median line narrow, joining anterior transverse line, finely approaching basal constriction; anterior transverse line wider than median line. Surface smooth; basal constriction narrow, flange short.

Elytron: Disk regularly convex in lateral and frontal view, slightly flattened at sutura in frontal view. Oval, a third longer than wide, maximum width at middle. Reflexed lateral margin subserrulated, humeral tooth small but distinct, situated posteriorly; intervals smooth, flattened, eighth wider than seventh, striae one and two free at base, striae almost punctate-striate, punctures of striae slightly impressed, evanescent, striae shortened at base, one reaching apex, all others obsolete in apical quarter, lateral channel narrower at middle, umbilical setigerous punctures with gap at middle; lateral margin at apex conspicuously widened by emargination of interval eight.

Hind wings: Not visible.

Dorsal surface: Proepisternum indistinctly reticulated. Sternites of abdomen slightly transversely sulcate, smooth.

Legs: Protibia slightly sulcate, with fine longitudinal reticulation, with apical spine distinctly arcuate, the basal lateral spine obtuse, the other much larger and acute, movable spur regularly arcuate.

Male genitalia: Unknown.

Female genitalia (Fig. 18): Gonocoxites not much sclerotized, straight in basal three-quarters, gently curved apically, with small cone-like seta before beginning of apical quarter, ventro-medially with eight nematiform setae; laterotergite with three moderately long nematiform setae.

Variability: Unknown.

Distribution: Known from the type locality, Lake Kenyir in West Malaysia (Fig. 20).

***Parasyleter rastellus* sp. nov.**

Figs 7, 14, 19, 20

Holotype: RBINS; ♂, with labels and data: yellow, black printed "CAMBODIA Siem Reap, Angkor Thom 26.V.2003 Light trap Leg. J. Constant, K. Smets & P. Grootaert Coll. I.R.Sc.N.B. (RBINS)".

Paratypes: MHNG; 1 ♂, 1 ♀, VENTIANE [sic] LAOS. 64. R / Coll. J. Ochs in Coll. M. Curti MHNG-1991. – PBCP; 1 ♂, 1 ♀, 2 specs., VIETNAM Nat. park NAM CAT TIEN 1. – 15. 5. 1994 Zacharda lgt.

Diagnosis: A large-sized species with five-setose labrum, the clypeus isodiametrically reticulated and the frons smooth, and fully developed eyes. Differentiated mainly from *P. porphyreus* by the five-setose labrum and the smooth frons of the head. Differentiated mainly from *S. doriae* by the elevated smooth clypeal field. Moreover, the species is extraordinary characterized from all other species by the peculiar apex of the male aedeagus.

Etymology: The name is a noun and refers to the apex of the male aedeagus (Latin rastellus, masculine = small hoe).

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Description:
Measurements: Body length 2.25-2.44 mm ($\bar{x}$: = 2.35 mm*), width 0.78-0.85 mm ($\bar{x}$: = 0.82 mm*), ratio length/width of pronotum 0.89-0.91 ($\bar{x}$: = 0.9*), ratio length/width of elytra 1.55-1.63 ($\bar{x}$: = 1.6*); (*n = 7).
Colour: Piceous. Antenna, palpi, and legs testaceous. Supraantennal plate translucent laterally.
Head: Distinctly narrower than a third of pronotum, frons and clypeus anterior eye-level conspicuously elongated. Clypeus straight anteriorly, with lateral angle obtuse rounded, fused with clypeal wing and supraantennal plate, all reflexed margined, clypeal field elevated, square, flattened, smooth, separated from anterior margin of clypeus by flat distinctly isodiametrically reticulated area, separated from frons by a distinct straight transverse furrow, separated from elongated convex supraantennal plate by parallel running deep and wide clypeal furrows, extending up to anterior eye-level; supraantennal plate keeled posteriorly, extended over eye-level to posterior end of gena-level; clypeus separated from anterior margin by flat isodiametrically reticulated area, clypeus separated from frons by a distinct transverse furrow. Frons slightly convex, smooth, supraorbital furrow wide. Clypeal, frontal, and supraorbital furrow connected. Frons with slight central pore at middle, laterally with obtuse carina. Neck constriction not developed, with few punctures laterally. Eye convex, of regular size in lateral view, somewhat flattened in dorsal view, gena indistinct. Antenna reaching up to base of pronotum, antennomeres five to ten elongated (around 25% longer than wide). Labrum straight anteriorly, indistinctly reticulated, five-setose, the central and the two lateral setae robust, the intermediate ones indistinct.
Pronotum: Disk in lateral view slightly convex, regularly convex in frontal view but slightly impressed at median line. Outline sub-trapezoid, convex to globose, wider than long, widest in posterior third, narrowed in anterior half, posterior angle completely rounded off. Reflexed lateral margin smooth, ending in posterior setigerous puncture; anterior angle not projecting. Lateral channel narrow, as wide as reflexed lateral margin, anterior marginal setigerous puncture removed from channel by diameter of pore, posterior puncture located in the channel. Median line narrow but distinct in its whole length, joining anterior transverse line; anterior transverse line wider than median line, consisting of row of punctures. Surface smooth, with indistinct transverse rugae; basal constriction distinct, flange about 1.5 as wide as constriction.
Elytron: Disk flattened in anterior half in lateral view, regularly convex in frontal view. Elongated, around 1.6 times longer than wide, with nearly straight but slightly diverging margin anterior middle, maximum width posterior middle. Humerus distinct. Apex pointed. Reflexed lateral margin subserrulated, humeral tooth small but visible, situated just posterior to humerus; intervals smooth, moderately convex, eighth as wide as seventh and at apex with carina-like concave vault; striae punctate-striate, punctures distinctly impressed, stria one reaching apex, two to seven ending before reaching apex at carina-like vault of interval eight; lateral channel with umbilical setigerous punctures narrower at middle, at apex conspicuously widened by emargination of interval eight.
Hind wings: Fully developed.
Dorsal surface: Proepisternum smooth. Sternites of abdomen slightly transversely sulcate, terminal sternite at apex with indistinct punctured reticulation in males, half of sternite covered with distinct reticulation in females.
Legs: Protibia sulcate, with indistinct longitudinal reticulation, with apical spine distinctly arcuate, the two lateral spines obtuse, movable spur regularly arcuate.
Male genitalia (Fig. 14): Aedeagus in ventral view with long basal opening, moderately and regularly curved, at apex with short flattened but conspicuous hoe; in lateral view nearly straight, apical tip distorted, turned ventrally; internal sac with five large triangular teeth; ventral paramere wide, both parameres rounded at apex, both asetose.
Female genitalia (Fig. 19): Gonocoxites regularly curved, slender in apical half, base stout, with moderately sized cone-like seta at middle, ventro-medially with nine long nematiform setae; laterotergite with two long and one short nematiform setae.
Variability: In two of the paratypes, the clypeal field is somewhat unevenly structured. The median pore on the frons of the head is more or less impressed.

Distribution: From the South of Laos over Cambodia to the South of Vietnam (Fig. 20).

***Parasyleter livaguensis* sp. nov.**
Figs 8, 15, 20

Holotype: BMNH; ♂, with labels and data: white, handwritten in black ink, with first line underlined in yellow "6. SABAH Mt. Kinabalu Nat. Pk. 5000 Ft R. Livagu 9. VIII. 1982 N.E. Stork B.n. 1982 – 388" / printed and handwritten "river bank debris Gravel area".

Paratype: MBCB; ♂, MALAYSIA-Sabah Kinabatangan river near village Kg. Koyah 4.-5.6.98, J. Horák leg.

Diagnosis: A large-sized species with five-setose labrum and fully developed eyes. Different mainly from *S. porphyreus* by the five-setose labrum and the smooth frons of the head. Differentiated mainly from *S. doriae* and *S. rastellus* by the big eye and the narrowed lateral margin and channel of the pronotum. Moreover, it is the only species with a longitudinal group of small punctures laterally on the pronotum. In addition, the species is very characterized from all other species by the differences in the male aedeagus.

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Fig. 20. Map of East Asia providing an overview on the occurrence of *Parasyleter* species described so far (recorded localities plotted). 1 (black) *P. doriae* (Putzeys, 1873); 2 (white) *P. porphyreus* (Andrewes, 1923); 3 (black circle) *P. malayicus* (Andrewes, 1927); 4 (red) *P. perak* sp. nov.; 5 (yellow) *P. kerdil* sp. nov.; 6 (blue) *P. rastellus* sp. nov.; 7 (orange) *P. livaguensis* sp. nov. Basic schematic map of Asia taken from SimpleMappr.net.

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Etymology: The name is an adjective and refers to the river Livagu where the holotype was found.

Description:
Measurements: Body length 2.63/2.31 mm, width 0.86/0.85 mm, ratio length/width of pronotum 0.86/0.86, ratio length/width of elytra 1.6/1.58.
Colour: Testaceous. Antenna, palpi, and clypeal field flavous. Supraantennal plate translucent laterally.
Head: Distinctly narrower than a third of pronotum, frons and clypeus anterior to the eye-level conspicuously elongated. Clypeus indistinctly convex anteriorly, with lateral angle distinct but rounded, fused with clypeal wing and nearly completely with supraantennal plate, all reflexed margined, clypeal field slightly elevated, square, with flattened and slightly uneven surface, separated from elongated convex supraantennal plate by slightly diverging wide clypeal furrows, extending up to anterior eye-level; supraantennal plate keeled posteriorly, extended over eye-level to posterior end of gena-level, clypeal field separated from anterior margin of clypeus by flat irregular reticulated area, clypeal field separated from frons by a distinct straight transverse furrow. Frons slightly convex, smooth, supraorbital furrow moderately wide, deep. Clypeal, frontal, and supraorbital furrows connected. Frons without central pore, laterally with indistinct carina. Neck constriction not developed. Eye relatively large, nearly hemispherical, projecting laterally, surrounded by dark pigment, gena indistinct. Antenna reaching up to base of pronotum, antennomeres five to ten elongated (around 40% longer than wide). Labrum concave anteriorly, indistinctly reticulated, five-setose, the central and the two lateral setae longer than the intermediate ones.
Pronotum: Disk in lateral view slightly convex, regularly convex in frontal view but distinctly impressed at median line. Outline sub-trapezoid, transverse, widest before posterior setigerous punctures, narrowed convex in anterior half, posterior angle indistinctly indicated by a slight thickening of the marginal margin. Reflexed lateral margin smooth, narrower at middle, extended over posterior setigerous puncture by one to two diameters of pore; anterior angle not projecting, rounded off. Lateral channel narrower at middle, marginal setigerous punctures located nearly in the channel. Median line deep, consisting of irregularly joining longitudinal punctures, joining anterior transverse line; anterior transverse line slightly wider than median line, consisting of row of punctures. Surface smooth, laterally with longitudinal group of small punctures; basal constriction distinct, flange more than 1.5 wider than constriction.
Elytron: Disk slightly convex in anterior half in lateral view, regularly convex in frontal view, flattened at sutura and first interval. Elongated, around 1.6 times longer than wide, with short straight but diverging part anterior middle, maximum width posterior middle. Humerus distinct. Apex slightly pointed. Reflexed lateral margin slightly subserrulated in anterior half, serrulation partly nearly invisible, more distinct posteriorly, humeral tooth small but sharp, situated just posterior to humerus; intervals smooth, moderately convex, first flattened in anterior half, eighth wider than seventh and at apex with carina-like concave vault; striae punctate-striate, punctures distinctly impressed, stria one reaching apex, two to seven ending before reaching apex at carina-like vault of interval eight; lateral channel with umbilical setigerous punctures narrower at middle, at apex conspicuously widened by emargination of interval eight.
Hind wings: Wings developed.
Dorsal surface: Proepisternum with fine transverse rugae, nearly smooth. Sternites of abdomen slightly transversely sulcate, terminal sternite in apical third with indistinct meshed reticulation (male).
Legs: Protibia nearly smooth, with apical spine moderately arcuate, the two lateral spines distinct, movable spur thin, slightly arcuate.
Male genitalia (Fig. 15): Aedeagus in ventral view with long basal opening, moderately and regularly curved, at apex with moderately sized flattened and distorted spatula; in lateral view straight, with flattened lateral side; internal sac with small group of fine bristles at middle; ventral paramere wide, both parameres somewhat acuminated at apex, both asetose.
Female genitalia: Unknown.
Variability: In the paratype the eyes are slightly less convex compared to the holotype.

Distribution: Known from the type locality in the Mount Kinabalu National Park at the rivers Liwagu [Livagu river] and Kinabatangan in Sabah, Malaysia Borneo (Fig. 20).

Specimen incertae sedis

BMNH; 1 ♀, blue, handwritten in black ink “Siam” / white, printed “Bowring 63.47*”. *Remark*: The specimen was submitted without head and pronotum.

DISCUSSION AND CONCLUDING NOTES

So far, the genus *Parasyleter* has been recorded from Thailand, Cambodia, the South of Vietnam, and over the Malay Archipelago up to the Wallace Line. In addition, it occurs in Sri Lanka (Fig. 20).
Four of the seven species were found on the Malay Peninsula with three of them with peculiar adaptations such as evidently reduced eyes, distinctly enlarged genae, a serrulated lateral margin of the elytra, oval shape of the elytra without humeri, missing hind wings, and uniformly brown colour. These combination of characters are considered as adaptations to deeper layers in the soil. Such characters are usually found in species with reduced dispersal power. Therefore, it is hypothesized that these species are endemic on the Malayan peninsula.

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Out of the three species with these conspicuous adaptations (*P. malayicus, perak* sp. nov., *kerdil* sp. nov.), *P. kerdil* sp. nov. exhibits the smallest eyes. In *P. doriae* the eyes are not distinctly reduced but somewhat flattened. In addition, specimens from Borneo seem to have slightly less elongated elytra. Some specimens from Borneo show reduced hind wings. This character was not observed in specimens from West Malaysia. It is hypothesized that wing dimorphism is present in some populations of this species.

Parasyleter porphyreus from Sri Lanka seems to be not only geographically isolated. It is the only species with a seven-setose labrum and smooth lateral margin of the elytra.

However, zoogeographic considerations cannot be taken into account at present due to the very limited material available.

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