

# Subfamily Melasinae Fleming, 1821

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### FAMILY EUCNEMIDAE (False Click Beetles)

**Diagnosis.** Length 1.50–40.00 mm; body moderately elongate to very elongate; vestiture of recumbent setae often present, usually unicolored, sometimes bicolored; flat, scale-like setae present in some; color uniformly light brown to black, sometimes bicolored or metallic; head deeply inserted into prothorax, somewhat hidden above, strongly transverse, somewhat declined; antennae inserted in front above frontoclypeal region; antennae 11-segmented (rarely 12-segmented), variable in length; scape elongated, inflated; pedicel small, globular, subterminally attached to scape; antennae either moniliform, capitate, clavate, serriform, filiform, pectinate, bipectinate, biserrate or flabellate; mandibles variable, either stout, with basal ventral tooth or slender, without teeth; eyes variable, either small or large, incised in some groups; pronotum variable, either quadrate, longer than wide or wider than long; widest in middle, often parallel-sided or arcuate laterally; disc convex, usually with impressions or gibbositities; lateral pronotal ridge present, usually simple and well developed or serrate and divided; hind angles variably developed; hypomera variable, either without antennal grooves, with notosternal antennal grooves or with lateral antennal grooves; lateral antennal grooves variable, either shallow or deep, wide or narrow, basally opened or basally closed; prothoracic sternal spine variable; either poorly developed, low or high and truncate; elytra variably striate from absent to well striate; interstices usually elevated; metathoracic coxal plates either wider mediad, parallel-sided or wider laterad; male protarsomere I with or without sex combs; male sex combs either basal and straight, basal and curved, encompass entire length or apical; lateral surfaces of mesothoracic and metathoracic tibiae variable with either setae only, setae and transverse rows of spine combs or setae and irregularly placed spines; tarsomere IV either simple or excavate-emarginate; tarsal claws either serrate, simple or basally toothed; last visible ventrite variable, either apically rounded, strongly produced, truncated or bispinose; male aedeagus extremely variable, trilobate; female genital tract variable (MUONA 1993, 2010).

#### Key to the subfamilies within the family Eucnemidae in Laos

- 1 Lateral surfaces of mesothoracic and metathoracic tibiae with setae and spines or setae and transverse rows of spine combs. .... **2**
- Lateral surfaces of mesothoracic and metathoracic tibiae with setae only. .... **Melasinae Fleming, 1821**
- 2 Mesothoracic and metathoracic tibiae with sharp angles between lateral and caudal surfaces. .... **Eucneminae Eschscholtz, 1829**
- Mesothoracic and metathoracic tibiae with rounded angles between lateral and caudal surfaces. .... **Macraulacinae Fleutiaux, 1922**

#### SUBFAMILY MELASINAE FLEMING, 1821

**Diagnosis.** Form oblong to elongate; antennae sexually dimorphic; antennal sensory pegs concentrated on apices and sides of individual antennomeres; mandibles short,

stout; lateral pronotal sides either with a simple ridge or with divided, serrate ridges; hypomeron either simple, without antennal grooves or with notosternal antennal grooves; prothoracic tibiae with single apical spur; tarsomere IV either simple or bilobed; pretarsal claws simple; male prothoracic tarsomere I with or without basal or apical sex combs; male aedeagus either bulbous, wide and with an entire, free median lobe, or highly modified with an enlarged flagellum; female eight sternite partially sclerotized; bursa simple, divided; spermatheca reduced, sclerotized.

#### Key to the tribes within the subfamily Melasinae

- 1 Form cylindrical. .... 2
- Form narrowed cranial and caudal. .... 4
- 2 Hypomera narrowed cranial. .... 3
- Hypomera parallel-sided. .... **Melasini Fleming, 1821**
- 3 Antennae either pectinate or flabellate. ... **Calyptocerini Muona, 1993**
- Antennae either tubular or serrate, flattened with lateral keels. ....  
..... **Xylobiini Reitter, 1911**
- 4 Pronotum with simple lateral ridge. .... **Epiphanini Muona, 1993**
- Pronotum usually with divided lateral ridges. ....  
..... **Dirhagini Reitter, 1911**

#### Tribe Melasini Fleming, 1821

**Diagnosis.** Form cylindrical; mandibles short, without ventral tooth; antennomeres 3–10 equal, either pectinate or flabellate; pronotum with simple lateral ridge; hypomeron without antennal grooves, nearly parallel-sided; prothoracic sternal peg high and strongly convex behind prothoracic coxae; male prothoracic tarsomere I without sex combs; last visible ventrite strongly produced; tergite VII usually keeled, exposed; aedeagus originally bulbous; median lobe entire, free and originally with both dorsal and ventral basal struts; bursa divided, simple; spermatheca divided, sclerotized.

#### *Melasis* Olivier, 1790

**Diagnosis.** Melasini, with apical margin of frontoclypeal region feebly trilobed and less than twice as wide as between antennal sockets; antennal grooves absent; metathoracic coxal plate medially 1.20–2.50 times wider than laterally; last visible ventrite strongly produced; tibiae flattened; tarsal claws simple; lateral surfaces of mesothoracic and metathoracic tibiae with setae only; male aedeagus dorsoventrally compressed, without secondary lateral lobes; median lobe simple, usually pointed apically; lateral lobes simple, entire; flagellum simple.

**Note.** Identification of these two species was made possible by translating, interpreting and comparing information from FLEUTIAUX (1934) and LEILER (1985) with these specimens.

**Key to the species of *Melasis* (males only)**

- 1 Antennomere IV serrate; flabellate from V–X. ....  
 ..... *Melasis balwanti* Fleutiaux, 1934  
 – Antennae flabellate from IV–X. .... *Melasis brinchangi* Leiler, 1985

***Melasis balwanti* Fleutiaux, 1934**

(Figs 1 and 2)

**Material examined.** One specimen was available for study: “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), 130–1900 m, 7.iv.–25.v.2010, 20°12'N, 104°01'E, leg. C. Holzschuh” / “BMNH{E}, 2012-14, C. Holzschuh” (BMNH).

**Redescription.** Length, 9.00 mm. Width, 2.00 mm. Body cylindrical, elongate and tapering towards the elytral apex; uniformly dark brown-black; antennae black, except second antennomere dark reddish; legs dark brown to black, tarsi medium-dark brown; head, pronotum and elytra clothed with short, yellow recumbent setae (Fig. 1).

*Head:* Very closely punctate, subspherical; frons convex, with circular fovea above frontoclypeal region; surface shiny; apical margin of frontoclypeal region trilobed, less than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Flabellate from antennomeres V–X in males, short and not reaching to hind angles of pronotum; antennomere III twice as long as II, antennomere IV serrate, ramus on V three-fourths as long as VI, ramus on VI slightly shorter than VII, rami on VII–X subequal (Fig. 2).

*Pronotum:* Very closely punctate, rugose basally and laterally; surface somewhat shiny; longer than wide, with short, sharp hind angles; parallel-sided, apically wider; disc convex, with median groove extending from base up 1/2 the length of pronotum; base sinuous.

*Scutellum:* Slightly rugose, oblong, sub-triangular and distally rounded.

*Elytra:* Strongly striate; interstices elevated with dense punctations.

*Legs:* First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae flattened in cross section; lateral surfaces of mesothoracic and metathoracic tibiae with hairs only; metathoracic tarsomeres I–IV simple; metathoracic tarsomere V elongate with simple claws; metathoracic tibiae slightly shorter than the combined lengths of all tarsi.

*Venter:* Punctate and rugose, with yellow recumbent setae; hypomeron simple, without antennal grooves; metathoracic episternum partially concealed, apically widened; metathoracic coxal plates parallel-sided.

**Differential diagnosis.** Simply serrate, non-flabellate antennomere IV in males will distinguish *M. balwanti* from male specimens of *M. brinchangi*.

**Distribution.** A very rare eucnemid species was previously known from India. The species was taken for the first time in Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** GARDNER (1935) described larvae collected from a *Gynocardia odorata* Brown (Achariaceae) log in Bengal, India. A single beetle was taken in a tropical montane deciduous forest.

***Melasis brinchangi* Leiler, 1985**

(Fig. 3)

**Material examined.** Three specimens were available for study: “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), 1300–1900 m, 7.iv.–25.v.2010, 20°12′N, 104°01′E, leg. C. Holzschuh” / “BMNH{E}, 2012-14, C. Holzschuh” (BMNH, GERP).

**Redescription.** Length, 8.00 mm. Width, 2.00 mm. Body cylindrical, elongate and tapering towards the elytral apex; uniformly dark brown-black; antennae black, except second antennomere dark reddish; legs dark brown to black, tarsi medium brown; head, pronotum and elytra clothed with short, yellow recumbent setae (Fig. 3).

*Head:* Very closely punctate, subspherical; frons convex, with circular fovea above frontoclypeal region; surface shiny; apical margin of frontoclypeal region trilobed, less than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Flabellate from antennomeres IV–X in males, V–X in females, short and not reaching to hind angles of pronotum; antennomere III twice as long as II; males: ramus on IV half as long as V, ramus on V two-thirds as long as VI, ramus on VI slightly shorter than VII, rami on VII–X subequal; females: ramus absent on IV and subequal to III, ramus on V three-fourths as long as VI, ramus on VI three-fourths as long as VII, ramus on VII slightly shorter than VIII, rami on VIII–X subequal.

*Pronotum:* Very closely punctate, rugose basally and laterally; surface somewhat shiny; longer than wide, with short, sharp hind angles; parallel-sided, apically wider; disc convex, with median groove extending from base up 2/3 the length of pronotum; base sinuous.

*Scutellum:* Slightly rugose, oblong, sub-triangular and distally rounded.

*Elytra:* Strongly striate; interstices elevated with dense punctations.

*Legs:* First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae flattened in cross section; lateral surfaces of mesothoracic and metathoracic tibiae with hairs only; metathoracic tarsomeres I–IV simple; metathoracic tarsomere V elongate with simple claws; metathoracic tibiae as long as the combined lengths of all tarsi.

*Venter:* Punctate and rugose, with yellow recumbent setae; hypomeron simple, without antennal grooves; metathoracic episternum partially concealed, apically widened; metathoracic coxal plates parallel-sided.

**Differential diagnosis.** Flabellate antennomere V in males will distinguish *M. brinchangi* from male specimens of *M. balwanti*.

**Distribution.** Apparently a very rare eucnemid species previously known from Malaysia. The species was taken for the first time in Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. Several beetles were taken from a tropical montane deciduous forest.

**Tribe Calyptocerini Muona, 1993**

**Diagnosis.** Form cylindrical; mandibles short, with secondary ventral tooth; antennomere III small; antennae either pectinate or flabellate; pronotum with simple

lateral ridge; hypomeron without antennal grooves, narrowing cranially; prothoracic sternal peg low, with simple apex; male prothoracic tarsomere I without sex combs; metathoracic coxal plates parallel-sided; tergite VII keeled; aedeagus bulbous; median lobe entire, wide, fused with lateral lobes, distinct, without dorsal basal struts; lateral lobes narrow, with small apical tooth; bursa simple and divided; spermatheca divided and sclerotized, with globular apical parts.

### *Otho Lacordaire, 1857*

**Diagnosis.** Calyptocerini, with apical margin of frontoclypeal region feebly trilobed and more than twice as wide as between antennal sockets; antennal grooves absent; metathoracic coxal plates laterally wider than medially; last visible ventrite strongly produced; tarsal claws simple; antennomeres II and III short, subequal; combined shorter than antennomere IV; lateral surfaces of mesothoracic and metathoracic tibiae with setae only; male aedeagus dorsoventrally compressed, without secondary lateral lobes; median lobe simple, usually pointed apically; lateral lobes simple, entire; flagellum complex, apically wide.

**Note.** Identification of the species was made possible by translating and interpreting information from the key provided by LUCHT (1989).

### *Otho coomani Fleutiaux, 1924*

(Fig. 4)

**Material examined.** Eight specimens were available for study: 2, "LAOS, 1–18.v.2001, Bolikhamxai prov., 18°21'N 105°08'E, Ban Nape (8 km NE), ~600 m, Vit Kubáň leg." (NHMB); 1, "LAO-NE, Hua Phan prov., ~20°12' N 104°01'E, PHU PHAN Mt., 1500–1900 m, 17.v.–3.vi.2007, M. Brancucci leg" / "NHMB Basel, expedition to Laos, 2007" (NHMB); 1, "NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), 1300–1900 m, 7.iv.–25.v.2010, 20°12'N, 104°01'E, leg. C. Holzschuh" / "BMNH{E}, 2012–14, C. Holzschuh" (GERP); 4, "NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), N20°12' E104°01', 1300–1900 m, 11.iv.–15.v.2012" / "BMNH{E}, 2012–14, C. Holzschuh" (BMNH).

**Redescription.** Length, 5.00–8.00 mm. Width, 1.75–2.50 mm. Body subcylindrical, elongate and tapering towards the elytral apex; uniformly dark brown-black; antennae black; legs dark brown to black, tarsi medium brown; head, pronotum and elytra clothed with sparse, very short, white recumbent setae (Fig. 4).

*Head:* Very closely punctate, subspherical; frons convex, with median carina extending from frontoclypeal region to vertex; surface shiny; apical margin of frontoclypeal region very feebly trilobed, 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Pectinate from antennomeres IV–XI, short and not reaching to hind angles of pronotum.

*Pronotum:* Very closely punctate to rugose; surface somewhat shiny; about as long as wide, with moderate, sharp hind angles; sides arcuate; disc convex, with median groove extending from base to center of pronotum; base sinuous and slightly keeled.

*Scutellum:* Shiny, oblong, sub-triangular and distally rounded.

*Elytra:* Strongly striate; interstices elevated with dense punctations.

*Legs:* First tarsomere as long as the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate and rugose, with very short, white recumbent setae; hypomeron simple, without antennal grooves; metathoracic episternum partially concealed, apically widened; metathoracic coxal plates medially wider than laterally.

**Differential diagnosis.** LUCHT (1989) distinguished *O. coomani* in the identification key from other species in the region based on the presence of a very weak basal keel of the pronotum. All other species in the region have a furrow extending through the center of the pronotum.

**Distribution.** A rare eucnemid species previously known from Vietnam. The species was taken for the first time in Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. Adults were taken from a lowland semi-evergreen forest and tropical montane deciduous forest.

### Tribe Xylobiini Reitter, 1911

**Diagnosis.** Form cylindrical; size small; vestiture variable, clothed in inconspicuous yellowish setae; mandible short, with secondary ventral tooth; antennae tubular or flattened, usually with lateral ridges; antennomere III originally small; pronotum with simple lateral ridge; hypomeron without antennal grooves, narrowing cranially; prothoracic sternal peg low, apex simple; legs short; male prothoracic tarsomere I without sex combs; metathoracic coxal plates parallel-sided; tergite VII keeled; aedeagus bulbous; median lobe entire, wide, fused with lateral lobes, distinct, without dorsal basal struts; lateral lobes bilobed; flagellum complex, wide; bursa divided, simple; spermatheca divided, sclerotized, with globular apex.

#### Key to the genera within the tribe Xylobiini

- 1 Antennomeres II and III combined shorter than IV. .... 2
- Antennomeres II and III combined as long as or longer than IV. .... 3
- 2 Antennomeres IV–VII without lateral ridges. .... *Bioxylus* Fleutiaux, 1923
- Antennomeres IV–VII with lateral ridges. .... *Proxylobius* Fleutiaux, 1900
- 3 Notosternal suture as long as to up to twice as long as hypomeral base. .... *Xylophilus* Mannerheim, 1833
- Notosternal suture shorter than hypomeral base. .... *Saproxylobius* Leiler, 1990

***Xylophilus* Mannerheim, 1823**

(=*Xyloecus* Dejean, 1833: 85)

(=*Xylobius* Latreille, 1834: 124)

**Diagnosis.** Xylobiini, with apical margin of frontoclypeal region feebly trilobed and more than twice as wide as the distance between antennal sockets; antennal grooves absent; metathoracic coxal plates parallel-sided, last visible ventrite either rounded or truncated; antennae tubular, rounded in cross section; antennomeres II and III subequal, combined longer than IV; simple tarsal claws, lateral surfaces of mesothoracic and metathoracic tibiae with setae only; male aedeagus dorsoventrally compressed, without secondary lateral lobes; median lobe simple, usually pointed apically; lateral lobes simple, longitudinally bilobed; flagellum complex, apically wide.

**Note.** All Asian *Xylophilus* species are present in Japan. Both species were considered undescribed following comparison of these species against illustrations of *Xylophilus ainu* (Fleutiaux, 1922) and *Xylophilus rufomarginatus* (Fleutiaux, 1922) in HISAMATSU (1985).

**Key to the species of *Xylophilus***

- 1 Pronotal disc with pair of horizontal foveae and median groove; antennae weakly serrate. .... *Xylophilus hylocharoides* sp.nov.
- Pronotal disc with median groove only; antennae tubular. ....  
..... *Xylophilus laosianus* sp.nov.

***Xylophilus hylocharoides* sp.nov.**

(Fig. 5)

**Type material.** Female holotype: “LAO-NE, Hua Phan prov., 20°12’N, 104°01’E, PHU PHAN Mt., ~1750 m, 17.v.–3.vi.2007, Vít Kubáň leg.” / “NHMB Basel, expedition to Laos, 2007” / “HOLOTYPE, *Xylophilus hylocharoides*, Otto, det. R.L. Otto, 2014” (♀ handwritten behind species name on label) [red printed label]. Holotype is deposited in NHMB.

**Description.** Female holotype: Length, 4.00 mm. Width, 1.00 mm. Body cylindrical, elongate; uniformly black; antennae black, except antennomeres II & III reddish; femur dark brown-black; tibiae and tarsi reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 5).

*Head:* Very closely punctate, subspherical; frons convex, with median carina; surface somewhat shiny; apical margin of frontoclypeal region feebly trilobed, more than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Setose, weakly serrate from antennomeres VI–X, reaching almost 1/3 the length of its body; lateral ridge absent on antennomeres IV–X; antennomere III short, slightly shorter than II, combined as long as IV; antennomeres IV–X each quadrate, subequal, weakly serrate; antennomere XI as long as X.

*Pronotum:* Very closely rugose to granulose; surface dullish; slightly longer than wide, with moderate, sharp hind angles; basal 2/3 parallel-sided, apical 1/3 arcuate; disc convex, with a pair of horizontal foveae and delicate median groove extending from scutellum through the length of the pronotum; base sinuous.



*Scutellum*: Shiny, oblong, sub-triangular and distally rounded.

*Elytra*: Striate; interstices elevated, surfaces transversely rugose.

*Legs*: First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter*: Punctate, with short, yellowish recumbent setae; hypomeron simple, without antennal grooves; metathoracic episternum apically widened; metathoracic coxal plates parallel-sided.

**Etymology.** The specific epithet is named for its close appearance to a melasine group, *Hylochaeres* Du Val, 1859, especially with presence of a pair of horizontal foveae on the pronotal disc.

**Differential diagnosis.** Presence of horizontal foveae and dull, granulose pronotal surfaces will distinguish *X. hylocharoides* from *X. laosianus*.

**Distribution.** An apparently rare, endemic eucnemid species known from a holotype collected within the Houaphanh province in Northeastern Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. A single beetle was taken from a tropical montane deciduous forest.

*Xylophilus laosianus* sp.nov.

(Fig. 6)

**Type material.** Male holotype: “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), 1300–1900 m, 27.iv.–1.vi.2011, 20°12’N, 104°01’E, leg. C. Holzschuh” / “BMNH{E}, 2012-14, C. Holzschuh” / “HOLOTYPE, *Xylophilus, laosianus*, Otto, det. R.L. Otto, 2014” (♂ handwritten behind species name on label) [red printed label]. Holotype is deposited in BMNH.

Paratypes: 6, from the following localities: 1, “LAO-NE, Hua Phan prov., 20°12’N, 104°01’E, PHU PHAN Mt., ~ 1750 m, 17.v.–3.vi.2007, Vít Kubán leg.” / “NHMB Basel, expedition to Laos, 2007” (NHMB); 1, “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), 1300–1900 m, 27.iv.–1.vi.2011, 20°12’N, 104°01’E, leg. C. Holzschuh” / “BMNH{E}, 2012-14, C. Holzschuh” (BMNH); 4, “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), N20°12’ E104°01’, 1300–1900 m, 11.iv.–15.v.2012” / “BMNH{E}, 2012-14, C. Holzschuh” (BMNH; GERP).

Each specimen labeled: “PARATYPE, *Xylophilus, laosianus*, Otto, det. R.L.Otto, 2014” (either ♂ or ♀ handwritten behind species name on each label) [yellow printed label]. All paratypes are deposited in BMNH, GERP and NHMB.

**Description.** Male holotype: Length, 5.00 mm. Width, 1.25 mm. Body cylindrical, elongate; uniformly dark brown, except scutellum reddish; antennae dark brown; legs dark reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Figure 6).

*Head*: Very closely punctate, subspherical; frons convex, with median carina; surface somewhat shiny; apical margin of frontoclypeal region feebly trilobed, more than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae*: Tubular, filiform from antennomeres VI–X, reaching almost 1/2 the length of its body; lateral ridge absent on antennomeres IV–X; antennomere III short, as

long as II, combined longer than IV; antennomeres IV–X each quadrate, subequal, tubular; antennomere XI slightly longer than X.

*Pronotum*: Very closely punctate to almost granulose; surface shiny; as long as wide, with moderate, sharp hind angles; basal 2/3 parallel-sided, apical 1/3 arcuate; disc convex; base sinuous, with delicate median groove extending almost the length of pronotum.

*Scutellum*: Shiny, oblong, sub-triangular and distally rounded.

*Elytra*: Striate; interstices elevated; surfaces closely punctate to rugose.

*Legs*: First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter*: Punctate, with short, yellowish recumbent setae; hypomeron simple, without antennal grooves; metathoracic episternum apically widened; metathoracic coxal plates parallel-sided.

**Variation.** Six adult paratypes were examined. Two male paratypes are as long as the holotype, with the length of 5.00 mm. Scutellum and elytral coloration are much darker than the holotype. Median pronotal groove is much shorter, extending to the center of the pronotum in one of the male paratype. Four female paratypes varied in lengths of 5.00–5.75 mm. One female paratype is slightly larger, more robust and coloration identical with the male holotype. Female antennae are shorter than males, reaching as far back as the hind angles of the pronotum. Median pronotal groove also showed some variations, with one specimen showing a shorter groove than all other specimens. One paratype female is slightly narrower than the holotype. Two of the female paratypes showed some reddish coloration at the elytral humeri, along with the reddish colored antennae.

**Etymology.** The specific epithet is named for the country in which the new species was collected.

**Differential diagnosis.** Simple and shiny, punctate to granulose pronotal surfaces will distinguish *X. laosianus* from *X. hylocharoides*.

**Distribution.** A rare, endemic eucnemid species known from a single locality within the Houaphanh province in Northeastern Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. All beetles were taken from a tropical montane deciduous forest.

### *Saproxylobius* Leiler, 1990

**Diagnosis.** Xylobiini, with apical margin of frontoclypeal region feebly trilobed and more than twice as wide as between antennal sockets; antennal grooves absent; metathoracic coxal plates parallel-sided; last visible ventrite rounded; antennal segments tubular, rounded in cross section, without lateral ridges; antennomeres II short,

antennomeres III elongate, combined longer than antennomere IV; simple tarsal claws; lateral surfaces of mesothoracic and metathoracic tibiae with setae only.

***Saproxylobius crassicollaris* Leiler, 1990**

(Fig. 7)

**Material examined.** Two specimens were available for study: 1, “LAOS, 1–9.v.1999, Louangphrabang pr., 20°33–4’N, 102°14’E, Ban Song Cha (5 km W), 1200 m, Vit Kubáň leg.” / *Proxylobius* sp., J. Muona det. 2014” (JMC); 1, “LAOS, BOLIKHAMSAI PROV., BAN NAPE ENV., 7–16 v 2004, 400 m, 18°20’N 105°08’E, LEG: E. JENDEK/ O. SAUSA” (AAC).

**Redescription.** Length, 3.00–5.00 mm. Width, 1.00–1.50 mm. Body subcylindrical, elongate and tapering towards elytral apex; uniformly dark brown, with pronotal apex and base, as well as elytral base variably infuscate reddish-brown; antennae reddish, except antennomeres I dark reddish-brown; femur dark reddish-brown, tibiae and tarsi medium reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 7).

*Head:* Closely, densely punctate, subspherical; frons convex, with median carina extending from frontoclypeal region to vertex; surface shiny; apical margin of frontoclypeal region feebly trilobed, more than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Strongly serrate from antennomeres III–X, reaching at least 3/4 the length of its body in males, weakly serrate and reaching up to 1/2 the length of its body in females; setose; antennomere III longer than II and slightly shorter than IV, combined longer than IV; antennomeres IV–X each longer than wide, subequal, strongly serrate; antennomere XI slightly longer than X.

*Pronotum:* Very closely punctate to granulose; surface dullish; as long as wide, with moderate, sharp hind angles; lateral sides arcuate, gradually narrowed towards craniad; disc convex; base sinuous, with pair of antescutellar circular foveae above scutellum.

*Scutellum:* Shiny, short, sub-triangular and distally rounded.

*Elytra:* Striate; interstices elevated; surface very closely, densely punctate.

*Legs:* First tarsomere as long as the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV narrow, excavate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Densely punctate, with short, yellowish recumbent setae; hypomeron simple, without antennal grooves; metathoracic episternum parallel-sided; metathoracic coxal plates parallel-sided.

**Differential diagnosis.** See Diagnosis of the monotypic genus.

**Distribution.** An uncommon eucnemid species previously known from Malaysia and Taiwan. The species was taken for the first time in Laos.

**Ecoregion(s).** Luang Prabang montane rain forests, Northern Annamites rain forests.

**Biology.** Larvae were described and partially illustrated by LEILER (1990). Adults were taken from a dry evergreen forest and lowland semi-evergreen forest.

***Bioxylus* Fleutiaux, 1923**

**Diagnosis.** Xylobiini, with apical margin of frontoclypeal region feebly trilobed and more than twice as wide as between antennal sockets; antennal grooves absent; metathoracic coxal plates parallel-sided; last visible ventrite strongly produced; antennal segments tubular, rounded in cross section, without lateral ridges; antennomeres II and III short, subequal; combined shorter than antennomere IV; simple tarsal claws; lateral surfaces of mesothoracic and metathoracic tibiae with setae only; male aedeagus dorsoventrally compressed, without secondary lateral lobes; median lobe simple, usually pointed apically; lateral lobes simple, longitudinally bilobed; flagellum complex, apically wide.

**Note.** Identification of *Bioxylus bakeri* was made possible through translating and interpreting information from FLEUTIAUX (1930). New species diagnosis was made following the reading of HISAMATSU (1959) publication.

**Key to the species of *Bioxylus***

- 1 Entirely dark brown or bicolored black and reddish. .... 2
- Entirely castaneus or chestnut brown in color. ....  
..... *Bioxylus castaneus* sp.nov.
- 2 Unicolored dark brown to black. .... 3
- Bicolored with black head and pronotum and reddish-orange elytra. ....  
..... *Bioxylus barclayi* sp.nov.
- 3 Antennae weakly serrate; pronotum granulate, dull. ....
- Antennae strongly serrate; pronotum closely punctate to rugose, shiny.  
..... *Bioxylus bakeri* Fleutiaux, 1930

***Bioxylus bakeri* Fleutiaux, 1930**

(Fig. 8)

**Material examined.** One specimen was available for study: “LAOS-NE, Houa Phan prov., 20°11–13′N 103°59′–104°01′E, Ban Saluei → Phou Pane Mts., 9.–17.vi.2009, 1300–1900 m, Michael Geiser leg.” / “NHMB Basel, NMPC Prague, Laos 2009 Expedition: M. Brancucci, M. Geiser, Z. Kraus, Dauck, V. Kubáň” (NHMB).

**Redescription.** Length, 5.25 mm. Width, 1.50 mm. Body subcylindrical, elongate; uniformly dark brown; antennae dark brown, except antennomeres I, II and part of III reddish; femur dark reddish to brown, tibiae and tarsi medium reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 8).

*Head:* Closely, evenly punctate, subspherical; frons convex, with median carina extending from frontoclypeal region to vertex; surface shiny; apical margin of frontoclypeal region feebly trilobed, more than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Strongly serrate from antennomeres VI–X, reaching at least 2/3 the length of its body; setose; antennomere III short, as long as II, combined shorter than IV; antennomeres IV–X each longer than wide, subequal, strongly serrate; antennomere XI slightly longer than X.

*Pronotum*: Very closely punctate, rugose; surface shiny; as long as wide, with large, sharp hind angles; lateral sides arcuate, gradually narrowed towards craniad; disc convex; base sinuous, with pair of circular foveae and median carina above scutellum.

*Scutellum*: Shiny, oblong, sub-triangular and distally rounded.

*Elytra*: Striate; interstices elevated; surface closely punctate to nearly rugose.

*Legs*: First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV narrow, excavate; metathoracic tarsomere V elongate with simple claws.

*Venter*: Punctate, with short, yellowish recumbent setae; hypomeron simple, without antennal grooves; metathoracic episternum parallel-sided; metathoracic coxal plates parallel-sided.

**Differential diagnosis.** Shiny, rugose surface of the pronotum, along with dark brown coloration will distinguish *B. bakeri* from other *Bioxylus* species.

**Distribution.** An apparently very rare eucnemid species previously known from Indonesia. The species was taken for the first time in Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. A single beetle was taken from a tropical montane deciduous forest.

***Bioxylus barclayi* sp.nov.**

(Fig. 9)

**Type material.** Male holotype: “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), N20°12' E104°01', 1300–1900 m, 11.iv.–15.v.2012” / “BMNH{E}, 2012-14, C. Holzschuh” / “HOLOTYPE, *Bioxylus, barclayi*, Otto, det. R.L. Otto, 2014” (♂ handwritten behind species name on label) [red printed label]. Female allotype, with same label data as holotype: / “ALLOTYPE, *Bioxylus, barclayi*, Otto, det. R.L. Otto, 2014” (♀ handwritten behind species name on label) [yellow printed label]. Holotype and allotype are deposited in BMNH.

Paratype: 1, from the following locality: “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), N20°12' E104°01', 1300–1900 m, 11.iv.–15.v.2012” / “BMNH{E}, 2012-14, C. Holzschuh” / PARATYPE, *Bioxylus, barclayi*, Otto, det. R.L. Otto, 2014” (♂ handwritten behind species name on label) [yellow printed label] (GERP). Paratype is deposited in GERP.

**Description.** Male holotype: Length, 5.00 mm. Width, 1.50 mm. Body cylindrical, elongate; black, except apical margin of pronotum and elytra reddish-brown; antennae black, except antennomeres I–III infuscate dark reddish; legs reddish-brown; tarsi reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 9).

*Head*: Very closely punctate, subspherical; frons convex, with circular fovea above base of frontoclypeal region; surface shiny; apical margin of frontoclypeal region feebly trilobed, more than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae*: Serrate from antennomeres VI–X, reaching 2/3 the length of its body; lateral ridge absent on antennomeres IV–X; setose; antennomere III short, shorter than II, combined shorter than IV; antennomeres IV–X each twice as long than wide, subequal, serrate; antennomere XI slightly longer than X.

*Pronotum*: Rugose to granulose; surface dull; as long as wide, with moderate, sharp divergent hind angles; basal 2/3 parallel-sided, apical 1/3 narrowed cranially, widest in middle; disc convex, with shallow median groove throughout entire length; base sinuous.

*Scutellum*: Shiny, oblong, sub-triangular and distally rounded.

*Elytra*: Striate; interstices elevated, closely punctate.

*Legs*: First tarsomere as long as the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter*: Punctate, with short, yellowish, recumbent setae; hypomeron simple, without antennal grooves; metathoracic episternum caudally widened; metathoracic coxal plates parallel-sided; last abdominal tergite strongly produced.

*Allotype*: Length 6.00 mm, width 2.00 mm; same as male except antennae are shorter and stouter; antennomeres IV–X are slightly longer than wide; larger and stouter body form.

**Variation.** One adult male paratype was examined. Coloration on the elytra and antennae are slightly darker than the holotype. Antennomeres II and III are redder in coloration than the holotype. No other physical characterizations differ between the holotype and paratype.

**Etymology.** The specific epithet is dedicated to a colleague, Max Barclay of the BMNH, who made this survey possible.

**Differential diagnosis.** Black coloration with reddish-brown elytra will distinguish *B. barclayi* from other *Bioxylus* species in Laos. It is very similar to other bi-colored *Bioxylus* species in Southeast Asia, particularly *Bioxylus galloisi* Fleutiaux, 1922, *Bioxylus japonensis* (Fleutiaux, 1900), *Bioxylus personatus* Mamaev, 1976 and *Bioxylus similis* Hisamatsu, 1985. *Bioxylus barclayi* differ from *B. galloisi*, *B. personatus* and *B. similis* based on the antennae; antennomeres IV–XI being serrate and black in the new species and weakly serrate and orange in the other species. The new species is also similar to *B. japonensis*. *Bioxylus japonensis* have dark infuscate reddish antennomeres IV–XI and dull elytra.

**Distribution.** A very rare, endemic eucnemid species known from a single locality within the Houaphanh province in Northeastern Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. All adults were taken from a tropical montane deciduous forest.

### *Bioxylus castaneus* sp.nov.

(Fig. 10)

**Type material.** Male holotype: “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), 1300–1900 m, 7.iv.–25.v.2010, 20°12'N, 104°01'E, leg. C. Holzschuh” / “BMNH{E}, 2012-14, C. Holzschuh” / “HOLOTYPE, *Bioxylus, castaneus*, Otto, det. R.L. Otto, 2014” (♂ handwritten behind species name on label) [red printed label]. Female allotype: with same label data as holotype: / “ALLOTYPE, *Bioxylus, castaneus*, Otto, det. R.L. Otto, 2014” (♀ handwritten behind species name on label) [yellow printed label]. Holotype and allotype are deposited in BMNH.

Paratypes: 5, from the following locality: 1, “LAO, Phongsaly prov., 21°41′N 102°6′E, PHONGSALY env., 6.–17.v.2004, ~1500 m, Vít Kubáň leg.” (NHMB); 1, “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), 1300–1900 m, 27.iv.–1.vi.2011, 20°12′N, 104°01′E, leg. C. Holzschuh” / “BMNH{E}, 2012–14, C. Holzschuh” (GERP); 3, “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), N20°12′ E104°01′, 1300–1900 m, 11.iv.–15.v.2012” / “BMNH{E}, 2012–14, C. Holzschuh” (BMNH).

Each specimen labeled: “PARATYPE, *Bioxylus castaneus*, Otto, det. R.L. Otto, 2014” (either ♂ or ♀ handwritten behind species name on each label) [yellow printed label]. All paratypes are deposited in BMNH, GERP and NHMB.

**Description.** Male holotype: Length, 4.00 mm. Width, 1.00 mm. Body cylindrical, elongate; uniformly reddish-brown; antennae and legs reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 10).

*Head:* Very closely punctate, subspherical; frons convex, with median carina extending from frontoclypeal region to vertex; surface somewhat shiny; apical margin of frontoclypeal region feebly trilobed, more than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Serrate from antennomeres VI–X, reaching 2/3 the length of its body; lateral ridge absent on antennomeres IV–X; setose; antennomere III short, as long as II, combined shorter than IV; antennomeres IV–X each twice as long than wide, subequal, serrate; antennomere XI slightly longer than X.

*Pronotum:* Very closely punctate, rugose; surface somewhat shiny; slightly longer than wide, with moderate, sharp hind angles; basal 3/4 parallel-sided, apical 1/4 arcuate; disc convex; base sinuous, with small carina above scutellum.

*Scutellum:* Shiny, oblong, sub-triangular and distally rounded.

*Elytra:* Striate; interstices elevated, closely punctate.

*Legs:* First tarsomere as long as the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish, recumbent setae; hypomeron simple, without antennal grooves; metathoracic episternum parallel-sided; metathoracic coxal plates parallel-sided.

*Allotype:* Length 5.50 mm, width 1.25 mm; same as male except antennae are shorter and stouter, about 1/2 the length of its body; antennomeres IV–X are less serrate, slightly longer than wide.

**Variation.** Five adult paratypes were examined. Four male paratypes are shorter in length compared with the female allotype, but most are as long as the holotype. One of the male paratype is slightly shorter than the holotype, measuring 3.50 mm long. Length of the single female paratype is 4.00 mm; slightly shorter and narrower than the allotype, identical with the male holotype. Basal ridge at the base of the pronotum above the scutellum exhibits no variations at all. All other physical characterizations among these specimens are consistent and show little to no variations at all.

**Etymology.** The specific epithet is derived from its overall reddish-brown coloration.

**Differential diagnosis.** Uniformly reddish-brown coloration will distinguish *B. castaneus* from any *Bioxylus* species in Laos.

**Distribution.** A rare, endemic eucnemid species known from two localities in Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. All adults were taken from a tropical montane deciduous forest.

***Bioxylus granulatus* sp.nov.**

(Fig. 11)

**Type material.** Male holotype: “Collection Naturhistorisches Museum Basel” / “LAO, Phongsaly prov., 21°41–2’N, 102°06–8’E, 28.v.–20.vi.2003, PHONGSALY env., ~ 1500 m, Vít Kubáň leg.” / “HOLOTYPE, *Bioxylus, granulatus*, Otto, det. R.L. Otto, 2014” (♂ handwritten behind species name on label) [red printed label]. Female allotype: “LAOS, Louangnamtha pr., 21°09’ N 101°19’E, Namtha → Muang Sing, 5–31.v.1997, 900–1200 m, Vít Kubáň leg.” / “ALLOTYPE: *Bioxylus, granulatus*, Otto, det. R.L. Otto, 2014” (♀ handwritten behind species name on label) [yellow printed label]. Holotype and allotype are deposited in NHMB.

**Description.** Male holotype: Length, 3.50 mm. Width, 1.00 mm. Body cylindrical, elongate; uniformly black, except for apical margin of pronotum and base of elytra reddish; antennae infusate reddish; femur dark brown to black; tibiae and tarsi reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 11).

*Head:* Very closely punctate, subspherical; frons convex, with median carina; surface somewhat dullish; apical margin of frontoclypeal region feebly trilobed, more than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Weakly serrate from antennomeres VI–X, reaching 2/3 the length of its body; lateral ridge absent on antennomeres IV–X; setose; antennomere III short, as long as II, combined shorter than IV; antennomeres IV–X each twice as long than wide, subequal, weakly serrate; antennomere XI slightly longer than X.

*Pronotum:* Granulose; surface dullish; slightly wider than long, with moderate, sharp hind angles; basal 1/2 parallel-sided, apical 1/2 arcuate; disc convex; base sinuous, with small basal carina above scutellum.

*Scutellum:* Shiny, oblong, sub-triangular and distally rounded.

*Elytra:* Striate; interstices elevated; surfaces shiny, sparsely punctate.

*Legs:* First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron simple, without antennal grooves; metathoracic episternum parallel-sided; metathoracic coxal plates parallel-sided.

*Allotype:* Length 5.00 mm, width 1.50 mm; body stouter; antennae shorter and stouter, about 1/2 the length of its body; antennomeres IV–X are less serrate, slightly longer than wide; antennal coloration dark black, except antennomeres II and III reddish; body dark black, without reddish areas at base of pronotum or elytra; elytral interstices more rugose to granulose.

**Etymology.** The specific epithet is derived from its granulose texture on the pronotum.



**Differential diagnosis.** Granulose, dull texture of the pronotum, along with black coloration with reddish margin of the pronotum and elytral base will distinguish *B. granulatus* from other *Bioxylylus* species.

**Distribution.** A very rare, endemic eucnemid species known from single localities within the Louangnamtha and Phongsaly provinces in northern Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. Adults were taken from a dry evergreen forest and tropical montane deciduous forest.

### *Proxylobius* Fleutiaux, 1900

(=*Phizoschilus* Fleutiaux, 1930: 273)

**Diagnosis.** Xylobiini, with apical margin of frontoclypeal region feebly trilobed and more than twice as wide as between antennal sockets; antennal grooves absent; metathoracic coxal plates parallel-sided; last visible ventrite either rounded or truncated; antennal segments flattened, keeled and serrate; antennomeres II and III short, subequal; combined shorter than antennomere IV; simple tarsal claws; lateral surfaces of mesothoracic and metathoracic tibiae with setae only; male aedeagus dorsoventrally compressed, without secondary lateral lobes; median lobe simple, usually pointed apically; lateral lobes simple, longitudinally bilobed; flagellum complex, apically wide.

**Note.** Identification of both species were made through the examination of authoritatively identified specimens loaned from the BMNH.

#### Key to the species of *Proxylobius*

- 2 Hind angles straight. .... *Proxylobius orientalis* (Fleutiaux, 1896)
- Hind angles divergent. .... *Proxylobius gardneri* (Fleutiaux, 1930)

#### *Proxylobius gardneri* (Fleutiaux, 1930)

(Fig. 12)

*Phizoschilus gardneri* Fleutiaux, 1930: 273–274.

**Material examined.** Five specimens were available for study: 1, “LAOS, Houaphanh, Phou Pan Mt., 12.–17.5.2004, Petr Kresl leg.” / “30 km S of Xam Neua, alt. 2000 m, 103°59'E, 20°13'N” / “*Melanoscython* sp., J. Muona det. 2014” (JMC); 2, “LAO-NE, Hua Phan prov., 20°12' N 104°01'E, PHU PHAN Mt., ~1750 m, 17.v.–3.vi.2007, Vit. Kubáň leg” / “NHMB Basel, expedition to Laos, 2007” (NHMB); 1, “LAOS-NE, Xieng Khouang prov., 19°37–8'N 103°20–1'E, Phonsavan (30 km NE): Phou Sane Mt., 1400–1700 m, 10.–30.v.2009, D. Hauck leg.” / “NHMB Basel, NMPC Prague, Laos 2009 Expedition: M. Brancucci, M. Geiser, Z. Kraus, D. Hauck, V. Kubáň” (NHMB); 1, “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), N20°12' E104°01', 1300–1900 m, 11.iv.–15.v.2012” / “BMNH{E}, 2012–14, C. Holzschuh” (BMNH).

**Redescription.** Length, 4.50–5.00 mm. Width, 1.00–1.25 mm. Body subcylindrical, elongate; uniformly black, except apical margin of pronotum, hind angles and elytral humeri reddish; antennae black, except antennomeres II, III and XI reddish; femur reddish-black, tibiae and tarsi medium reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 12).

*Head:* Very closely punctate, subspherical; frons convex, with median carina extending from frontoclypeal region to vertex; surface somewhat dullish; apical margin of frontoclypeal region feebly trilobed, more than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Serrate from antennomeres VI–X, reaching at least 2/3 the length of its body; lateral ridge present on antennomeres IV–X; setose; antennomere III short, as long as II, combined shorter than IV; antennomeres IV–X each longer than wide, subequal, strongly serrate; antennomere XI slightly longer than X.

*Pronotum:* Very closely punctate, granulose; surface somewhat dull; slightly longer than wide; hind angles short, sharp and divergent; lateral sides arcuate; disc with fine, shallow, median groove; base sinuous.

*Scutellum:* Shiny, oblong, sub-triangular and distally rounded.

*Elytra:* Striate; interstices elevated, granulose.

*Legs:* First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV narrow, excavate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron simple, without antennal grooves; metathoracic episternum apically widened; metathoracic coxal plates parallel-sided.

**Differential diagnosis.** Divergent pronotal hind angles will distinguish *P. gardneri* from *P. orientalis*.

**Distribution.** An apparently rare eucnemid species previously known from China and India. The species was taken for the first time in Laos.

**Ecoregion(s).** Luang Prabang montane rain forests, Northern Indochina subtropical forests.

**Biology.** GARDNER (1930) described larvae collected from rotten *Machilus odoratissima* Nees (Lauraceae) wood in Darjeeling, India. BEESON (1941) reported the species bores in decaying wood of *Cedrus deodara* (Roxburgh) G. Don (Pinaeaceae). All adults were taken from a tropical montane deciduous forest.

### *Proxylobius orientalis* (Fleutiaux, 1896)

(Fig. 13)

*Xylobius orientalis* Fleutiaux, 1896: 538–539.

**Material examined.** Five specimens were available for study: 1, “LAO-NE, Hua Phan prov., 20°12' N 104°01'E, PHU PHAN Mt., ~1750 m, 17.v.–3.vi.2007, Vit. Kubáň leg.” / “NHMB Basel, expedition to Laos, 2007” (NHMB); 1, “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), 1300–1900 m, 27.iv.–1.vi.2011, 20°12'N, 104°01'E, leg. C. Holzschuh” / “BMNH{E}, 2012-14, C. Holzschuh” (BMNH); 3, “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), N20°12' E104°01', 1300–1900 m, 11.iv.–15.v.2012” / “BMNH{E}, 2012-14, C. Holzschuh” (BMNH, GERP).

**Redescription.** Length, 4.00–5.00 mm. Width, 1.25–1.50 mm. Body subcylindrical, elongate; uniformly black; antennae black, except antennomeres II, III and XI variably reddish; femur reddish-black, tibiae and tarsi medium reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 13).

*Head:* Very closely punctate, subspherical; frons convex, with median carina extending from frontoclypeal region to vertex; surface somewhat dullish; apical margin of frontoclypeal region feebly trilobed, more than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Serrate from antennomeres VI–X, reaching at least 2/3 the length of its body in males, up to 1/2 the length of its body in females; lateral ridge present on antennomeres IV–X; setose; antennomere III short, as long as II, combined shorter than IV; antennomere V slightly shorter than IV; antennomeres VI–X each longer than wide, subequal, strongly serrate; antennomere XI slightly longer than X.

*Pronotum:* Very closely punctate, granulose; surface somewhat dull; slightly longer than wide; hind angles moderate, sharp, narrow and straight; lateral sides arcuate; disc convex; base sinuous.

*Scutellum:* Shiny, oblong, quadrate and distally rounded.

*Elytra:* Striate; interstices elevated, granulose.

*Legs:* First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron simple, without antennal grooves; metathoracic episternum apically widened; metathoracic coxal plates parallel-sided.

**Differential diagnosis.** Straight prothoracic hind angles will distinguish *P. orientalis* from *P. gardneri*.

**Distribution.** An apparently rare eucnemid species previously known from China and Myanmar. The species was taken for the first time in Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. All adults were taken from a tropical montane deciduous forest.

### Tribe Epiphanini Muona, 1993

**Diagnosis.** Body long, narrowing cranially and caudad; head usually with keeled frons; mandibles short, with a secondary tooth; pronotum with simple lateral ridge; hypomeron simple, without antennal grooves; metathoracic coxal plates narrowed laterally; legs short, narrowed; lateral surfaces of mesothoracic and metathoracic tibiae with setae only; tarsomeres simple; pretarsal claws simple; male prothoracic tarsomere I without basal sex combs; aedeagus with median lobe deeply and widely bifurcate, fused to lateral lobes; lateral lobes bilobed; flagellum complex.

### *Hylis des Gozis, 1886*

(=*Hypocaelus* auct., not Dejean, 1833)

(=*Hypohylis* Reitter, 1911: 203)

(=*Elatocoelus* Hyslop, 1921: 644)

**Diagnosis.** Epiphanini, with apical margin of frontoclypeal region evenly rounded and either more or less than twice as wide as the distance between antennal sockets; antennal grooves absent; metathoracic coxal plates medially 3.00–6.00 times wider than laterally; last visible ventrite either rounded or truncated; antennal segments flattened, keeled and serrate; simple tarsal claws; lateral surfaces of mesothoracic and metathoracic tibiae with setae only; male aedeagus dorsoventrally compressed, without secondary lateral lobes; median lobe simple, deeply and widely bifurcate apically; lateral lobes simple, longitudinally bilobed; flagellum complex, tubular.

***Hylis parallelus* sp.nov.**

(Fig. 14)

**Type material.** Female holotype: “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), N20°12′ E104°01′, 1300–1900 m, 11.iv.–15.v.2012” / “BMNH{E}, 2012-14, C. Holzschuh” / “HOLOTYPE, *Hylis, parallelus*, Otto, det. R.L. Otto, 2014” (♀ handwritten behind species name on label) [red printed label]. Holotype is deposited in BMNH.

Paratypes: 1, from the following locality: 1, “LAOS north, 13–24.V.1997, 15 km NW Louang Namtha, N21°07.5, E101°21.0., alt 750 ±100m, E. Jendek & O. Šauša leg.”.

Specimen labeled: “PARATYPE, *Hylis, parallelus*, Otto, det. R.L. Otto, 2014” (♀ handwritten behind species name on each label) [yellow printed label]. Paratype is retained in GERP.

**Description.** Female holotype: Length, 4.00 mm. Width, 1.00 mm. Body subcylindrical, elongate; uniformly black; antennae black, except antennomeres II and XI apically reddish; femur black, tibiae and tarsi medium reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 14).

*Head:* Very closely punctate, subspherical; frons convex, with median carina extending from frontoclypeal region to vertex; surface somewhat dullish; apical margin of frontoclypeal region evenly rounded, more than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Serrate from antennomeres VI–X, reaching to pronotal hind angles; antennomere III shorter than combined lengths of IV and V; antennomere IV subequal to II and V; antennomeres IV–VI longer than wide; antennomeres VII–X wider than long; antennomere XI longer than X.

*Pronotum:* Very closely punctate; surface somewhat shiny; slightly longer than wide, with moderate, sharp hind angles; basal half parallel-sided, apical half arcuate; disc convex; base sinuous.

*Scutellum:* Shiny, oblong, sub-triangular and distally rounded.

*Elytra:* Weakly striate; interstices slightly elevated with dense punctations.

*Legs:* First tarsomere longer than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate and rugose, with short, yellowish recumbent setae; hypomeron simple, without antennal grooves; metathoracic episternum apically widened; metathoracic coxal plates medially 3.00–6.00 times wider than laterally; last visible ventrite truncate.

**Variation.** One adult female paratypes was examined. The female paratype is 5.00 mm long and 1.25 mm wide; larger and wider than the holotype. Median carina is less

developed than the holotype. Antennae are slightly thicker in the paratype. Generally, the paratype is structurally similar to the holotype.

**Etymology.** The specific epithet is derived from the shape of the pronotum, that being parallel-sided at the basal 3/4.

**Differential diagnosis.** Identification of the new species was made possible by comparing the specimen against information of *Hylis sandakanus* Fleutiaux, 1930, the only other *Hylis* species in mainland Asia. *Hylis parallelus* differ from *H. sandakanus* by the presence of weakly indicated elytral striae. According to FLEUTIAUX (1930), *H. sandakanus* lack any elytral striae, except for a single set near the elytral suture.

**Distribution.** An apparently very rare, endemic eucnemid species known from two localities in Laos. MUONA (1991a) noted a new species of *Hylis* from Vietnam in one of the analysis in his study. Without seeing the specimen, it is possible the Vietnamese specimen may also be one of this species.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. Adults were taken from a dry evergreen forest and tropical montane deciduous forest.

### Tribe Dirhagini Reitter, 1911

**Diagnosis.** Form narrowing craniad and caudad; vestiture variable, clothed in inconspicuous yellowish setae; mandible short, with secondary ventral tooth; male prothoracic tarsomere I originally with apical sex combs; pronotal lateral ridge serrate, often divided; hypomeron either simple or with notosternal antennal grooves, usually with deep pit near prothoracic coxae and narrowing craniad; metathoracic coxal plates originally narrowed laterad; median lobe deeply and widely bifurcate, without dorsal basal struts; ventral basal struts of median lobe lost; median lobe and lateral lobes fused without sutures; lateral lobes bilobed; flagellum complex, tubular; bursa divided, simple; spermatheca divided, sclerotized, originally with globular apex.

#### Key to the genera within the tribe Dirhagini

- |   |   |   |
|---|---|---|
| 1 | Antennae pectinate, serrate, filiform or moniform. ....         | 2 |
| – | Antennae bipectinate or biserrate (Fig. 75). ....               |   |
|   | ..... <i>Sarpedon</i> Bonvouloir, 1871                          |   |
| 2 | Antennomere III shorter than or as long as IV. ....             | 3 |
| – | Antennomere III longer than IV. ....                            | 4 |
| 3 | Antennomeres II and III combined longer than IV (Fig. 30). .... |   |
|   | ..... <i>Brevisegmentus</i> gen.nov.                            |   |
| – | Antennomeres II and III combined shorter than IV. ....          |   |
|   | ..... <i>Entomophthalmus</i> Bonvouloir, 1871                   |   |
| 4 | Frons without vertical ridges near compound eyes. ....          | 5 |
| – | Frons with vertical ridges near compound eyes. ....             |   |
|   | ..... <i>Dirrhagofarsus</i> Fleutiaux, 1935                     |   |

- 5 Apices of elytra forming apical beak (Fig. 18). ..... 6  
 – Apices of elytra not forming apical beak. .... 7
- 6 Apical margin of frontoclypeal region more than twice as wide as base.  
 ..... **Farsus Du Val, 1860**  
 – Apical margin of frontoclypeal region less than twice as wide as base.  
 ..... **Arrhipis Bonvouloir, 1871**
- 7 Pronotum with posterior lateral ridge. .... 8  
 – Pronotum without posterior lateral ridge (Fig. 41). ....  
 ..... **Siniugum gen.nov.**
- 8 Hypomeron with well developed notosternal antennal grooves. .... 9  
 – Hypomeron with cranially indicated notosternal antennal grooves. ....  
 ..... **Cafolus Bonvouloir, 1871**
- 9 Metathoracic coxal plates medially more than 1.25 times wider than  
 laterally. .... 10  
 – Metathoracic coxal plates parallel-sided. ....  
 ..... **Rhagomicrus Fleutiaux, 1902**
- 10 Apical margin of frontoclypeal region more than twice as wide as base.  
 ..... 11  
 – Apical margin of frontoclypeal region less than twice as wide as base.  
 ..... 12
- 11 Hypomeral pits near prothoracic coxae deep, well-defined on all sides.  
 ..... **Balistica Motschulsky, 1861**  
 – Hypomeral pits near prothoracic coxae deep, poorly defined. ....  
 ..... **Microrhagus Dejean, 1833**
- 12 Pronotum strongly arched anteriorly (Fig. 69). ....  
 ..... **Rhacopus Hampe, 1855**  
 – Pronotum evenly arched (Fig. 72, 74). ....  
 ..... **Prodirhagus Fleutiaux, 1925**

***Farsus Du Val, 1860***

(=*Hylochaeres* auct., not Latreille, 1834)

(=*Rhagomerus* Iablokov-Khnzorian, 1964: 162)

**Diagnosis.** Dirhagini, with apical margin of frontoclypeal region evenly rounded and more than twice as wide as the distance between antennal sockets; notosternal antennal grooves present; male prothoracic tarsomere I simple, with apical sex combs; metathoracic coxal plates medially 1.20–2.50 times wider than laterally; last visible ventrite either rounded or truncated; simple tarsal claws; lateral surfaces of mesothoracic and metathoracic tibiae with setae only; male aedeagus dorsoventrally compressed, without secondary lateral lobes; median lobe simple, deeply and widely bifurcate apically; lateral lobes simple, longitudinally bilobed; flagellum complex, tubular.

***Farsus salvazai* Fleutiaux, 1918**

(Fig. 15)

**Material examined.** Twenty specimens were available for study: 1, “LAOS, Umg. Vientiane, III.–VI.1963” / “*Farsus*, *Salvazai*, Fleut., A. Cobos det. 1965” (genus, species, author and year handwritten) (ZSM); 2, “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), 1300–1900 m, 7.iv.–25.v.2010, 20°12'N, 104°01'E, leg. C. Holzschuh” / “BMNH{E}, 2012-14, C. Holzschuh” (BMNH); 17, “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), N20°12' E104°01', 1300–1900 m, 11.iv.–15.v.2012” / “BMNH{E}, 2012-14, C. Holzschuh” (BMNH, GERP).

**Redescription.** Length, 5.00–9.00 mm. Width, 1.00–2.50 mm. Body oblong, elongate; uniformly medium-dark brown; antennae medium brown; legs medium-dark brown, tarsi medium-dark brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 15).

*Head:* Very closely punctate to granulose, subspherical; frons convex, with median circular fovea; surface somewhat shiny; apical margin of frontoclypeal region evenly rounded, 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Weakly serrate from antennomeres IV–X; antennomere III as long as the combined lengths of IV and V; antennomeres IV–X subequal, slightly longer than wide; antennomere XI longer than X; extends just beyond elytral humeri.

*Pronotum:* Closely punctate, rugose; surface shiny; about as long as wide, with moderate, sharp hind angles; basal 3/4 parallel-sided, apical 1/4 arcuate; disc flattened; anterior lateral pronotal ridge short, directed posteriorly; posterior lateral ridge elongate, extends up to 3/4 the length; base sinuous.

*Scutellum:* Shiny, oblong, quadrate and distally truncated.

*Elytra:* Striae absent; interstices flattened with dense punctations.

*Legs:* First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with basally wide notosternal antennal grooves; hypomeral pits near prothoracic coxae with poorly defined ridges; metathoracic episternum parallel-sided; metathoracic coxal plates medially 1.20–2.50 times wider than laterally.

**Differential diagnosis.** Larger size and darker colored dorsum will distinguish *F. salvazai* from *Farsus brevis* Fleutiaux, 1931. Largely absence of elytral striae will further distinguish *F. salvazai* from *Farsus exoticus* Bonvouloir, 1875.

**Distribution.** An uncommon eucnemid species previously known from Vietnam and Luang-Prabang, Laos. Recent records indicate *F. salvazai* is more widespread across northern Laos.

**Ecoregion(s).** Northern Indochina subtropical forests, Northern Khorat Plateau moist deciduous forests, Northern Thailand-Laos moist deciduous forests.

**Biology.** Developmental stages remain unknown. Adults were taken from a dry evergreen forest, lowland semi-evergreen forest and tropical montane deciduous forest.

***Arrhipis* Bonvouloir, 1871**

(=*Nematodinus* Lea, 1919: 730)

**Diagnosis.** Dirhagini, with apical margin of frontoclypeal region evenly rounded and less than twice as wide as the distance between antennal sockets; notosternal antennal grooves variably present; male prothoracic tarsomere I simple, with apical sex combs; metathoracic coxal plates parallel-sided; last visible ventrite either rounded or truncated; serrate antennae flattened, without lateral keels; apices of elytra forming apical beak; tarsal claws simple; lateral surfaces of mesothoracic and metathoracic tibiae with setae only; male aedeagus dorsoventrally compressed, without secondary lateral lobes; median lobe simple, deeply and widely bifurcate apically; lateral lobes simple, longitudinally bilobed; flagellum complex, tubular.

**Note.** Among the 18 species studied, BRÜSTLE *et al.* (2010) included two undescribed *Arrhipis* species from Laos in their molecular and morphological analysis for the phylogeny of the group. New species “1” was taken from Oudomxai, Laos in 2002. New species “4” was taken in Nong Lom, Laos in 1999. These two undescribed species remain unpublished and are therefore excluded from the current study until their specific names and descriptions are published.

Identification of *Arrhipis orientalis* Fleutiaux, 1896 was made possible through comparisons against authoritatively identified specimens loaned from the BMNH. Identification of the remaining three species were made through examination of these specimens against species descriptions provided in FLEUTIAUX (1931b, 1932).

**Key to the species of *Arrhipis***

- 1 Elytral striae either indicated or weakly indicated. .... 2
- Elytral striae absent. .... ***Arrhipis orientalis* Fleutiaux, 1896**
- 2 Frons convex; lateral pronotal ridge divided. .... 3
- Frons concave; lateral pronotal ridge complete. ....
- ..... ***Arrhipis cavifrons* Fleutiaux, 1931**
- 3 Uniformly reddish-brown; lateral ridge of antennal grooves caudally obliterated. .... ***Arrhipis striata* Fleutiaux, 1932**
- Uniformly medium-brown; lateral ridge of antennal grooves well-developed. .... ***Arrhipis capucina* Fleutiaux, 1932**

***Arrhipis capucina* Fleutiaux 1932**

(Figs 16 and 17)

**Material examined.** One specimen was available for study: “LAOS, Bolikhamxai pr., 18°16'N 103°11'E, 70 km NEE Vientiane, 27–30.iv.1997, 150 m, Vít Kubáň leg.” (NHMB).

**Redescription.** Length, 3.75–10.00 mm. Width, 1.50–2.00 mm. Body oblong, elongate; uniformly medium brown; antennae and legs reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 16).

*Head:* Very closely punctate to granulose, subspherical; frons convex; surface somewhat dull; apical margin of frontoclypeal region feebly trilobed, less than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.



*Antennae*: Weakly serriform from antennomeres IV–X; short, reaching to hind angles of pronotum; antennomere III longer than the combined lengths of IV and V; antennomeres IV–X subequal, slightly wider than long; antennomere XI slightly longer than X.

*Pronotum*: Closely punctate to rugose; surface somewhat dullish; longer than wide, with moderate, sharp hind angles; basal 3/4 parallel-sided, apical 1/4 arcuate; disc flattened, base sinuous, with short carina above scutellum extending near center of pronotum; anterior lateral pronotal ridge very short, directed ventrally; posterior lateral ridge elongate, extends up to 3/4 the length (Fig. 17).

*Scutellum*: Shiny, oblong, sub-triangular and distally rounded.

*Elytra*: Striae indicated; interstices elevated, densely punctate to rugose; setose.

*Legs*: First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–IV simple; metathoracic tarsomere V elongate with simple claws.

*Venter*: Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves, lateral ridge well-developed; hypomeral pits near prothoracic coxae with poorly defined ridges; metathoracic episternum parallel-sided; metathoracic coxal plates medially 2.00 times wider than laterally.

**Differential diagnosis.** Uniformly medium brown coloration and well-developed lateral ridge of antennal grooves will distinguish *A. capucina* from *A. striata*. Convex frons and divided lateral pronotal ridges will further distinguish *A. capucina* from *A. cavifrons*. Weakly indicated elytral striae will also distinguish *A. capucina* from *A. orientalis*.

**Distribution.** A very rare eucnemid species previously known from Vietnam. The species was taken for the first time in Laos.

**Ecoregion(s).** Luang Prabang montane rain forests.

**Biology.** Developmental stages remain unknown. A single adult was taken from a lowland semi-evergreen forest.

### *Arrhipis cavifrons* Fleutiaux 1931

(Figs 18 and 19)

**Material examined.** One specimen was available for study: “LAOS: Phontiou, nr. Thakek., April 1964. J. Rondon., B.M. 1964-342” / “Arrhipis, near inimica, det. W. Lucht (“Arrhipis near inimica” handwritten on label)” (BMNH).

**Redescription.** Length, 5.50 mm. Width, 1.75 mm. Body oblong, short; dull black, except apical margin of pronotum, elytral humeri and scutellum infuscate reddish; antennomeres I–II reddish; legs reddish-brown, tarsi reddish-brown; head, pronotum and elytra clothed with very short, yellowish recumbent setae (Fig. 18).

*Head*: Very closely punctate; frons concave; surface somewhat shiny; apical margin of frontoclypeal region evenly rounded, about 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae*: Left antennomeres III–XI missing; right antennomeres III–XI missing.

*Pronotum*: Closely punctate, rugose; surface dull; longer than wide, with moderate, sharp hind angles; basal 3/4 parallel-sided, apical 1/4 narrowing cranially; disc flattened;

base sinuous, with short carina above scutellum extending to middle; lateral pronotal ridge complete (Fig. 19).

*Scutellum*: Shiny, oblong, sub-triangular and distally rounded.

*Elytra*: Striae indicated; interstices elevated and transversely rugose.

*Legs*: First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–IV simple; metathoracic tarsomere V elongate with simple claws.

*Venter*: Punctate, with short, yellowish recumbent setae; hypomeron without notosternal antennal grooves; hypomeral pits near prothoracic coxae with poorly defined ridges; metathoracic episternum caudally widened; metathoracic coxal plates medially 2.00 times wider than laterally.

**Differential diagnosis.** Concave frons and complete lateral pronotal ridge will distinguish *A. cavifrons* from any *Arrhipis* species known from Laos.

**Distribution.** An apparently rare, widespread eucnemid species previously collected in Indonesia, Papua New Guinea and the Philippines. The species was taken for the first time in Laos.

**Ecoregion(s).** Northern Annamites rain forests.

**Biology.** Developmental stages remain unknown. A single beetle was taken from a lowland semi-evergreen forest.

### *Arrhipis orientalis* Fleutiaux 1896

(Figs 20 and 21)

**Material examined.** Three specimens were available for study: 1, “LAOS, Umg. Vientiane, III.–VI.1963” / “*Arrhipis, orientalis*, Fleut., A. Cobos det. 1964” (genus, species, author and year handwritten) (ZSM); 1, “LAOS c., Khammouan prov., NAKAI env., 4.–8.V.1998, Route No. 8, alt. 560 m, N17°42.8' E105°09.1' GPS, E. Jendek, O. Sauša lgt.” (GERP); 1, “LAOS, Vientiane prov., Lao Pako env., 200 m, 55 km NE Vientiane, 1–4.v.2004, J Bezděk leg.” (GERP).

**Redescription.** Length, 4.50–10.00 mm. Width, 1.50–2.00 mm. Body oblong, elongate; uniformly dark brown; antennae and legs reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 20).

*Head*: Very closely punctate to rugose, subspherical; frons convex; surface somewhat dull; apical margin of frontoclypeal region feebly trilobed, less than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae*: Weakly serriform from antennomeres IV–X; short, reaching to hind angles of pronotum; antennomere III longer than the combined lengths of IV and V; antennomeres IV–X subequal, slightly wider than long; antennomere XI ovoid, slightly longer than X.

*Pronotum*: Closely punctate to rugose; surface somewhat dullish; longer than wide, with moderate, sharp hind angles; lateral sides parallel-sided; disc flattened, base sinuous, with short carina above scutellum; anterior lateral pronotal ridge very short, directed ventrally and posteriorly; posterior lateral ridge elongate, extends up to 3/4 the length (Fig. 21).

*Scutellum*: Shiny, oblong, sub-triangular and distally rounded.

*Elytra*: Striae absent; interstices flattened, densely punctate to rugose; setose.

*Legs:* First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–IV simple; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves, lateral ridge well-developed; hypomeral pits near prothoracic coxae with poorly defined ridges; metathoracic episternum parallel-sided; metathoracic coxal plates medially 2.00 times wider than laterally.

**Differential diagnosis.** Uniformly dark brown coloration and lack of elytral striae will distinguish *A. orientalis* from both *A. capucina* and *A. striata*. Convex frons and divided lateral frontal ridges will further distinguish *A. orientalis* from *A. cavifrons*.

**Distribution.** A very rare, widespread eucnemid species found in India, Indonesia, Laos, Thailand and Vietnam. In Laos, *A. orientalis* have been taken at Sem-Kam (“Haut-Mékong prov.”) (FLEUTIAUX 1923). Recent records indicate the species continues to thrive in both northern and central areas of Laos.

**Ecoregion(s).** Northern Annamites rain forests, Northern Khorat Plateau moist deciduous forests.

**Biology.** GARDNER (1935) described larvae collected from a decaying *Macaranga denticulata* (Blume) (Euphorbiaceae) log in Bengal, India. BEESON (1941) reported the species bores in decaying wood of *Anthocephalus cadamba* (now *Neolamarkia cadamba* (Roxburgh) Bosser (Rubiaceae)). All beetles were taken from a lowland semi-evergreen forest and tropical montane evergreen forest.

### *Arrhipis striata* Fleutiaux 1932

(Figs 22 and 23)

**Material examined.** Thirteen specimens were available for study: 1, “LAOS, Louangnamtha pr., 21°00′N 101°25′E, LOUANG NAMTHA, 4.v.1997, 600 m, Vít Kubáň leg.” (NHMB); 1, “LAOS, Bolikhamxai pr., 18°16′N 103°11′E, 70 km NEE Vientiane, 27–30.vi.1997, 150 m, Vít Kubáň leg.” (NHMB); 1, “LAOS, Champassak Prov., Ban Nong Luang (village), 12 km S of Pakxong, 15°6′N 106°12′E” / “800 m, at light, No. 39, 6.IV.1998, leg. O. Merkl & G. Csorba” (GERP); 6, “LAOS, 24–29.iv.2001, Khammouan prov., 18°07′N 104°29′E, Ban Khoun Ngeun, ~200 m, Vít Kubáň leg.” (NHMB); 1, “LAOS, Phongsaly prov., PHONGSALY env., 6.–17.v.2004, ~1500 m, 21°41′N 102°06′–8′E, M. Brancucci leg.” (NHMB); 1, “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), 1300–1900 m, 7.iv.–25.v.2010, 20°12′N, 104°01′E, leg. C. Holzschuh” / “BMNH{E}, 2012–14, C. Holzschuh” (GERP); 2, “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), N20°12′ E104°01′, 1300–1900 m, 11.iv.–15.v.2012” / “BMNH{E}, 2012–14, C. Holzschuh” (BMNH).

**Redescription.** Length, 6.00–7.00 mm. Width, 1.50–1.75 mm. Body oblong, elongate; uniformly reddish-brown; antennae reddish-brown; legs reddish-brown, tarsi yellowish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 22).

*Head:* Very closely punctate to granulose, subspherical; frons convex; surface somewhat shiny; apical margin of frontoclypeal region feebly trilobed, less than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Moniliform from antennomeres IV–X; short, reaching to hind angles of pronotum; antennomere III as long as the combined lengths of IV–VI; antennomeres IV–X subequal, wider than long; antennomere XI slightly longer than X.

*Pronotum:* Closely punctate, rugose; surface somewhat dullish; longer than wide, with moderate, sharp hind angles; basal 3/4 parallel-sided, apical 1/4 arcuate; disc

flattened; base sinuous, with short carina above scutellum; anterior lateral pronotal ridge very short, directed ventrally; posterior lateral ridge elongate, extends up to 2/3 the length (Fig. 23).

*Scutellum*: Shiny, oblong, quadrate and distally truncated.

*Elytra*: Striae indicated; interstices elevated with dense punctations.

*Legs*: First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–IV simple; metathoracic tarsomere V elongate with simple claws.

*Venter*: Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves, lateral ridges poorly developed caudally; hypomeral pits near prothoracic coxae with poorly defined ridges; metathoracic episternum parallel-sided; metathoracic coxal plates medially 2.00 times wider than laterally.

**Differential diagnosis.** Uniformly reddish-brown coloration, along with poorly developed lateral ridges of antennal grooves will distinguish *A. striata* from *A. capucina*. Convex frons and divided lateral pronotal ridges will further distinguish *A. striata* from *A. cavifrons*. Indicated elytral striae will also distinguish *A. striata* from *A. orientalis*.

**Distribution.** An uncommon eucnemid species previously known from the Philippines and Vietnam. The species was taken for the first time in Laos.

**Ecoregion(s).** Luang Prabang montane rain forests, Northern Annamites rain forests, Northern Indochina subtropical forests, Southern Annamites montane rain forests.

**Biology.** One specimen was taken at lights. These beetles were taken from a dry evergreen forest, lowland semi-evergreen forest, tropical montane deciduous forest, lowland semi-evergreen forest and tropical montane evergreen forest.

### ***Balistica* Motschulsky, 1861**

**Diagnosis.** Dirhagini, with apical margin of frontoclypeal region feebly trilobed and more than twice as wide as the distance between antennal sockets; notosternal antennal grooves present; male prothoracic tarsomere I simple, without apical sex combs; metathoracic coxal plates medially 3.00–6.00 times wider than laterally; last visible ventrite either rounded or truncated; hypomeral pits near prothoracic coxae deep, well-defined on all sides; tarsal claws simple; lateral surfaces of mesothoracic and metathoracic tibiae with setae only.

**Note.** The two known *Balistica* species were identified through translating and interpreting information provided in FLEUTIAUX (1899).

### **Key to the species of *Balistica***

- 1 Body cuneiform. .... 2
- Body cylindrical. .... *Balistica distincta* Fleutiaux, 1899
- 2 Lateral side of pronotum sinuous; pronotum as long as wide. ....
- ..... *Balistica vicina* Fleutiaux, 1899
- Lateral side of pronotum parallel-sided; pronotum slightly longer than wide. .... *Balistica cuneiforma* sp.nov.

***Balistica cuneiforma* sp.nov.**

(Figs 24 and 25)

**Type material.** Female holotype: “LAOS, 1–18.v.2001, Bolikhamxai prov., 18°21′N 105°08′E, Ban Nape (8 km NE) ~600 m, V. Kubáň leg.” / “HOLOTYPE, *Balistica, cuneiforma*, Otto, det. R.L. Otto, 2014” (♀ handwritten behind species name on label) [red printed label]. Holotype is deposited in NHMB.

Paratypes: 2, from the following localities: 1, “LAOS north, 5–11.V.1997, 20 km NW Luang Namtha, N 21°09.2′ E 101°18.7′, alt. 900 ±100 m, M. Strba & R. Hergovits leg.” / “*Balistica* sp.nov., J. Muona det. 2014” (JMC); 1, “LAOS, 1–18.v.2001, Bolikhamxai prov., 18°21′N 105°08′E, Ban Nape (8 km NE) ~600 m, V. Kubáň leg.” (NHMB).

Each specimen labeled: “PARATYPE, *Balistica, cuneiforma*, Otto, det. R.L. Otto, 2014” (either ♂ or ♀ handwritten behind species name on label) [yellow printed label]. Paratypes are deposited in JMC and NHMB.

**Description.** Female holotype: Length, 4.50 mm. Width, 1.25 mm. Body elongate, cuneiform; uniformly black; antennae black, except antennomeres II and XI apically reddish; legs and tarsi dark reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 24).

*Head:* Very closely punctate, subspherical; frons convex; surface shiny; apical margin of frontoclypeal region weakly trilobed, at least 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Weakly serrate from antennomeres IV–X, extending up to elytral humeri; antennomere IV shorter than II and V; antennomeres V–X subequal, slightly longer than wide; antennomere XI longer than X.

*Pronotum:* Closely punctate; surface shiny; slightly longer than wide, with moderate, sharp hind angles; basal 3/4 parallel-sided, apical 1/4 arcuate; disc convex; base sinuous, with short, median carina above scutellum; anterior lateral pronotal ridge elongate, directed posteriorly; posterior lateral ridge elongate, extending at least 3/4 the length (Fig. 25).

*Scutellum:* Shiny, oblong, quadrate and distally rounded.

*Elytra:* Striae absent; interstices flattened with dense punctations.

*Legs:* First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves; hypomeral pits near prothoracic coxae with well defined ridges; metathoracic episternum apically widened; metathoracic coxal plates medially 3.00–6.00 times wider than laterally.

**Variation.** One female and one male paratypes were examined. Female paratype measured 5.00 mm long. Male paratype measured 4.00 mm long. Female paratype is broader than the male. Elytral surfaces are more rugose in the male paratype as compared to the female holotype and paratype. No other exoskeletal difference can be found among these specimens.

**Etymology.** The new species name is derived from its cuneiform shape of its body.

**Differential diagnosis.** Cuneiform shape of the body will distinguish *B. cuneiforma* from *B. distincta* in Laos. Parallel-sided pronotum will further distinguish *B. cuneiforma* from *B. vicina*.

**Distribution.** A very rare, endemic eucnemid species known from two localities in central and northern areas of Laos.

**Ecoregion(s).** Northern Annamites rain forests, Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. Adults were taken from a lowland semi-evergreen forest and tropical montane deciduous forest.

***Balistica distincta* Fleutiaux, 1899**

(Figs 26 and 27)

**Material examined.** One specimen was available for study: “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), N20°12' E104°01', 1300–1900 m, 11.iv.–15.v.2012” / “BMNH{E}, 2012-14, C. Holzschuh” (BMNH).

**Redescription.** Length, 5.00 mm. Width, 1.25 mm. Body subcylindrical, elongate; uniformly black; antennae black, except antennomeres II and XI apically reddish; legs dark brown, tarsi dark brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 26).

*Head:* Very closely punctate, subspherical; frons convex; surface somewhat shiny; apical margin of frontoclypeal region weakly trilobed, 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Weakly serrate from antennomeres IV–X; antennomere IV shorter than II and V; antennomeres V shorter than VI; antennomeres VI–X subequal, slightly longer than wide; antennomere XI longer than X; extends up to elytral humeri.

*Pronotum:* Closely punctate; surface shiny; slightly longer than wide, with moderate, sharp hind angles; basal 3/4 parallel-sided, apical 1/4 arcuate; disc convex; base sinuous, with very short carina above scutellum; anterior lateral pronotal ridge short, slightly directed ventrally; posterior lateral ridge elongate, extending at least 3/4 the length (Fig. 27).

*Scutellum:* Shiny, oblong, sub-triangular and distally rounded.

*Elytra:* Striae absent; interstices flattened with dense to rugose punctations.

*Legs:* First tarsomere as long as the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves; hypomeral pits near prothoracic coxae with well defined ridges; metathoracic episternum apically widened; metathoracic coxal plates medially 3.00–6.00 times wider than laterally.

**Differential diagnosis.** Cylindrical, parallel body form will distinguish *B. distincta* from either *Balistica* species present in Laos.

**Distribution.** A very rare eucnemid species previously known from Indonesia, Myanmar and Philippines. The species was taken for the first time in Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. One adult was taken from a tropical montane deciduous forest.

***Balistica vicina* Fleutiaux, 1899**

(Figs 28 and 29)

**Material examined.** One specimen was available for study: “LAOS c., Bolikhamsai prov., BAN NAPE-Kaew Nua Pass, 18.4–1.5.1998, alt. 600 m, N18°22.3′ E105°09.1′ GPS, E. Jendek & O. Šauša lgt.” (GERP).

**Redescription.** Length, 5.00 mm. Width, 1.25 mm. Body subcylindrical, elongate and tapering towards the elytral apex; uniformly black; antennae black, except antennomere II and XI apically reddish; legs dark reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 28).

*Head:* Widely punctate, subspherical; frons convex; surface shiny; apical margin of frontoclypeal region weakly trilobed, 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Weakly serrate from antennomeres V–X; antennomeres III as long as the combined lengths of IV and V; antennomere II as long as IV; antennomere IV and V subequal; antennomeres VI–X subequal, slightly longer than wide; antennomere XI slightly longer than X.

*Pronotum:* Closely punctate; surface shiny; about as long as wide, with moderate, sharp hind angles; basal 2/3 parallel-side, slightly emarginated above hind angles; apical 1/3 arcuate; disc convex; base sinuous; anterior lateral pronotal ridge elongate, directed posteriorly; posterior lateral ridge elongate, extends about 1/2 the length of the pronotum (Fig. 29).

*Scutellum:* Shiny, oblong, quadrate and distally rounded.

*Elytra:* Striae absent; interstices flattened with dense punctations.

*Legs:* First tarsomere as long as the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves; outer ridge of antennal groove apically obliterated; inner ridge entire; hypomeral pits near prothoracic coxae with poorly defined ridges; metathoracic episternum parallel-sided; metathoracic coxal plates medially 1.20–2.50 times wider than laterally.

**Differential diagnosis.** Cuneiform body and quadrate pronotum will distinguish *B. vicina* from *B. distincta*. Sinuous lateral sides of the pronotum will further distinguish *B. vicina* from *B. cuneiforma* in Laos.

**Distribution.** A very rare eucnemid species previously known from Indonesia. The species was taken for the first time in Laos.

**Ecoregion(s).** Northern Annamites rain forests.

**Biology.** Developmental stages remain unknown. One adult was taken from a lowland semi-evergreen forest.

***Brevisegmentus* gen.nov.**

**Type species.** *Balistica miyatakei* Hisamatsu, 1955, designated here.

**Diagnosis.** Adults of *Brevisegmentus* superficially resemble several Dirhagine genera *Balistica*, *Microrhagus* and *Entomophthalmus*. The group can be distinguished from both groups by its short antennomere III in relation to antennomere IV. Both *Balistica* and *Microrhagus* each have elongate antennomere III, much longer than IV. The new group can be distinguished from *Entomophthalmus* by the combined lengths of antennomeres II and III are longer than antennomere IV. Antennomeres II and III combined are shorter than IV in *Entomophthalmus*. The presence of sex combs along the entire length of prothoracic tarsomere I is a unique feature among males of the group and will distinguish the group from any known members of the tribe.

**Description.** Male. Body elongate, approximately four times longer than wide, dorsally convex and ventrally well sclerotized.

*Head:* Hypognathus with short setae. Antennae serriform with 11 antennomeres, setose; scape three times longer than pedicel; pedicel globular, shorter than antennomere III; antennomere III shorter than antennomere IV; antennomeres IV–X subequal in lengths, longer than wide and rounded in cross sectional view; antennomere XI slightly longer than X. Compound eye round, well developed, incised, large. Antennal groove present in geni region between base of mandible and compound eye. Frontoclypeal region subtriangular, apically trilobed, about 2.50 times wider apically than the distance between antennal sockets. Mandibles well developed, stout, setose; left mandibles bidentate; right mandible unidentate. Maxillary and labial palpus concealed behind mandibles. Labrum concealed.

*Pronotum:* Convex, setose. Lateral sides parallel-sided, apically arcuate. Slightly wider than long. Two lateral pronotal ridges present. Disc convex. Base sinuous, with short median carina above scutellum.

*Scutellum:* Longer than wide, sub-triangular, distally rounded.

*Elytron:* Elongate, convex, laterally marginate, setose. Humeri with short, dorsolateral carina. Disc and humeri indistinctly striate. Interstices flattened.

*Legs:* Prothoracic legs shortest, metathoracic legs longest. Prothoracic tibia apically rounded, rounded in cross section, setose with one apical spur. Prothoracic tarsi I with straight sex combs covering entire length of segment (Fig. 33). Lateral side of mesothoracic and metathoracic tibiae with setae only. Mesothoracic and metathoracic tarsi, including claws as long as the tibia. First metathoracic tarsi as long as the combined lengths of remaining four. Metathoracic tarsi I–III simple. Metathoracic tarsi IV excavated-emarginated, slightly wider than III. Metathoracic tarsi V elongate with simple claws. Tarsal formula 5-5-5.

*Venter:* With elongate setae. Notosternal suture shorter than the hypomeral base. Hypomeron with parallel-sided notosternal antennal grooves. Hypomeral pits near procoxae with well defined ridges on all sides. Epipleura not grooved. Metathoracic episterna parallel-sided. Metathoracic coxal plate medially 3.00 times wider than laterally. Tarsal grooves absent on mesothoracic and metathoracic sterna. Abdoman with five visible ventrites, medially convex. Last visible ventrite caudally obtuse.



**Etymology.** The generic name combines *brevi-*, from the Latin *brevis*, meaning “small”, plus the Latin *segmentum*, meaning “segment”; named for its short antennomere III. Gender: masculine.

***Brevisegmentus miyatakei* (Hisamatsu, 1955) comb.nov. (Figs 30–33)**

*Balistica miyatakei* Hisamatsu 1955: 101–102.

**Material examined.** One specimen was available for study: “Collection Naturhistorisches Museum Basel” / “LAO, Phongsaly prov., 21°41–2’N 102°06–8’E, 28.v.–20.vi.2003, PHONGSALY env., ~1500 m, Vít Kubáň leg.” (NHMB).

**Description.** Length, 4.25 mm; width, 1.25 mm; body color reddish-brown (Fig. 30).

*Head:* Very closely punctate; subspherical; surface shiny; eyes slightly protuberant; frons convex. Antennae: Serriform, reaching about 2/3 the length of the body; reddish-brown (Fig. 31).

*Pronotum:* Reddish-brown, shiny with short, yellow recumbent setae; surfaces with closely spaced punctations; slightly wider than long, with moderate hind angles; lateral sides parallel-sided; arcuate apically; disc convex; base sinuous, with median carina above scutellum; anterior lateral pronotal ridge short, directed posteriorly, extends up to 1/4 the length; posterior lateral pronotal ridge elongate, extending nearly entire length of pronotum (Fig. 32).

*Scutellum:* Rugose, shiny, oblong, sub-triangular and distally rounded.

*Elytron:* Convex, shiny with short, yellow recumbent setae, reddish-brown; length 3.00 mm; width 0.66 mm at humeri; humeri and disc indistinctly striate; interstices flattened, closely punctate to transversely rugose.

*Legs:* Femur, tibiae and tarsi reddish-brown and somewhat shiny; surfaces shallowly punctate, with short, yellow recumbent setae.

*Venter:* Somewhat shiny; reddish-brown; surface with short, yellow recumbent setae; closely, shallowly punctate; abdominal sternum with dense, elongate recumbent setae; erect setae present on abdominal sterna IX.

**Differential diagnosis.** See Diagnosis of the monotypic genus.

**Distribution.** A very rare eucnemid species previously known from Japan. The species was taken for the first time in Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. One adult was taken from a tropical montane deciduous forest.

***Entomophthalmus Bonvouloir, 1871***

**Diagnosis.** Dirhagini with apical margin of frontoclypeal region evenly rounded and more than twice as wide as the distance between antennal sockets; antennomeres II and III combined shorter than IV; notosternal antennal grooves present; male prothoracic tarsomere I simple, without sex combs; metathoracic coxal plate medially 3.00–6.00 times wider than laterally; last visible ventrite either rounded, acute or slightly emarginated; simple tarsal claws; lateral surfaces of mesothoracic and metathoracic

tibiae with setae only; male aedeagus dorsoventrally compressed, without secondary lateral lobes; median lobe simple, deeply and widely bifurcate apically; lateral lobes simple, longitudinally bilobed; flagellum complex; tubular.

***Entomophthalmus coomani* Fleutiaux, 1928**

(Figs 34 and 35)

**Material examined.** One specimen was available for study: "LAOS c., Bolikhamsai prov., BAN NAPE-Kaew Nua Pass, 18.4–1.5.1998, alt. 600 m, N 18°22.3' E 105°09.1 GPS, E. Jendek, O. Šauša lgt" (JMC).

**Redescription.** Length, 4.00 mm. Width, 1.00 mm. Body subcylindrical, elongate; black, except head and anterior margin of pronotum; head, antennae, anterior margin of pronotum and elytral suture reddish; femur, tibiae and tarsi reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 34).

*Head:* Very closely and shallowly punctate, subspherical; frons convex, without fovea or carina; surface somewhat shiny; apical margin of frontoclypeal region rounded, more than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Filiform from antennomeres IV–X, reaching about 2/3 the length of its body; setose; antennomere II and III combined shorter than IV; antennomeres IV–X each longer than wide, subequal; antennomere XI about as long as X.

*Pronotum:* Shallowly and closely punctate; surface shiny; quadrate, slightly wider basally with moderate, sharp hind angles; lateral sides sub-parallel-sided; disc convex; base sinuous; anterior lateral pronotal ridge moderately elongate, directed ventrally; posterior lateral pronotal ridge extends near entire length of pronotum (Fig. 35).

*Scutellum:* Shiny, short, sub-triangular, distally rounded.

*Elytra:* Striae indistinct, except along suture; interstices flattened, surfaces shallowly punctate.

*Legs:* First tarsomere as long as the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves; metathoracic episternum parallel-sided; metathoracic coxal plates medially six times wider than laterally.

**Differential diagnosis.** Blackish dorsum with reddish antennae will distinguish *E. coomani* from *Entomophthalmus alutaceus* Fleutiaux, 1938, *Entomophthalmus lorai* Fleutiaux, 1896 and *Entomophthalmus suturalis* Fleutiaux, 1926. Shallowly punctate elytral surfaces will further distinguish *E. coomani* from *Entomophthalmus bonvouloiri* Fleutiaux, 1916.

**Distribution.** A very rare eucnemid species previously known from Malaysia and Vietnam. The species was taken for the first time in Laos.

**Ecoregion(s).** Northern Annamites rain forests.

**Biology.** Developmental stages remain unknown. A single adult beetle was taken from a lowland semi-evergreen forest.

***Rhagomicrus* Fleutiaux, 1902**

**Diagnosis.** Dirhagini with apical margin of frontoclypeal region evenly rounded and more than twice as wide as the distance between antennal sockets; notosternal antennal grooves present; male prothoracic tarsomere I simple, without sex combs; metathoracic coxal plate parallel-sided; last visible ventrite either rounded or truncated; simple tarsal claws; lateral surfaces of mesothoracic and metathoracic tibiae with setae only; male aedeagus dorsoventrally compressed, with basally attached secondary lateral lobes; median lobe simple, deeply and widely bifurcate apically; lateral lobes simple, longitudinally bilobed; flagellum complex; tubular.

**Note.** These three species were compared against the types of *Rhagomicrus circumdatus* Fleutiaux, 1929, *Rhagomicrus sandakanus* Fleutiaux, 1932 and *Rhagomicrus velutinus* (Fleutiaux, 1895) loaned from the Natural History Museum in Paris, France. None of the Laotian species matched with any of the known Southeast Asian *Rhagomicrus* species, so they are here described as new species.

**Key to the species of *Rhagomicrus***

- 1 Posterior lateral pronotal ridge elongate; antennae weakly serrate. ... **2**
- Posterior lateral pronotal ridge shorter; antennae moderately serrate. ...  
..... ***Rhagomicrus haucki* sp.nov.**
- 2 Antennomeres IV–X longer than wide; pronotum with short median groove. .... ***Rhagomicrus tibialis* sp.nov.**
- Antennomeres IV–X as long as wide; pronotum with elongate median groove. .... ***Rhagomicrus cylindriformis* sp.nov.**

***Rhagomicrus cylindriformis* sp.nov.**

(Figs 36 and 37)

**Type material.** Male holotype: “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), 20°12'N, 104°01'E, 1300–1900 m, 11.iv.–15.v.2012” / “BMNH{E}, 2012-14, C. Holzschuh” / “HOLOTYPE, *Rhagomicrus cylindriformis*, Otto, det. R.L. Otto, 2014” (♂ handwritten behind species name on label) [red printed label]. Holotype is deposited in BMNH.

Paratypes: 3, from the following localities: 1, “Collection Naturhistorisches Museum Basel” / “LAO, Phongsaly prov., 21°41'–2'N 102°06'–8'E, 28.v.–20.vi.2003, PHONGSALY env., ~1500 m, Vít Kubáň leg.” (NHMB); 1, “LAO, Phongsaly prov., 21°41'N 102°06'E, PHONGSALY env., 6.–17.v.2004, ~1500 m, Vít Kubáň leg.” (NHMB); 1, “LAOS-NE, Houa Phan prov., 20°13'09–19"N 103°59'54"–104°00'03"E, 1480–1550 m, PHOU PANE Mts., 9–16.vi.2009, David Hauck leg.” / “NHMB Basel, NMPC Prague, Laos 2009 Expedition: M. Brancucci, M. Geiser, Z. Kraus, D. Hauck, V. Kubáň” (GERP).

Each specimen labeled: “PARATYPE, *Rhagomicrus cylindriformis*, Otto, det. R.L. Otto, 2014” (♂ or ♀ handwritten behind species name on label) [yellow printed label]. Paratypes are retained in GERP and NHMB.

**Description.** Female holotype: Length, 5.75 mm. Width, 1.50 mm. Body cylindrical, elongate and tapering towards the elytral apex; uniformly black, except extreme base of elytra, apical margin of pronotum and elytral suture reddish; antennae reddish; femur dark reddish-brown, tibiae and tarsi reddish-brown; head, pronotum and elytra clothed with short, white recumbent setae (Fig. 36).

**Head:** Very closely punctate, almost granulose, subspherical; frons convex, with pair of small circular foveae laterad of compound eyes; surface somewhat shiny; apical

margin of frontoclypeal region evenly rounded, 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae*: Weakly serrate from antennomeres IV–X; antennomere III slightly longer than IV; antennomeres IV–X subequal, as long as wide; antennomere XI slightly longer than X; extends about 1/3 the length of the body.

*Pronotum*: Closely punctate, almost granulose; surface shiny; about as long as wide, with moderate, sharp hind angles; parallel-sided, apically arcuate; disc convex, with median groove and pair of horizontal foveae; base sinuous; anterior lateral pronotal ridge short, directed posteriorly; posterior lateral ridge elongate, extends 3/4 the length of pronotum (Fig. 37).

*Scutellum*: Shiny, quadrate, distally rounded with median groove apically present.

*Elytra*: Striate; interstices elevated with closely punctate to rugose surfaces.

*Legs*: First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter*: Punctate, with short, white recumbent setae; hypomeron with medially undefined notosternal antennal grooves; hypomeral pits near prothoracic coxae with poorly defined ridges; metathoracic episternum slightly widened apically; metathoracic coxal plates parallel-sided.

**Variation.** Two female and one male paratypes were examined. The size range from 4.00–5.00 mm long. Antennae are darker than the holotype. Median groove is shallowly indicated and confined to the basal 1/3 of the pronotal disc. Pair of horizontal foveae are absent in both paratypes. Median carina of the notosternal antennal grooves are fully developed in both paratypes. General coloration and exoskeletal characteristics are similar to the holotype.

**Etymology.** The specific epithet is derived from its cylindrical form of its habitus.

**Differential diagnosis.** Weakly serrate antennae and longer posterior lateral pronotal ridge will distinguish *R. cylindriformis* from *R. haucki*. Stout antennal segments and elongate median groove on the pronotal disc will further distinguish *R. cylindriformis* from *R. tibialis*.

**Distribution.** A very rare, endemic eucnemid species known from single localities in the Houphanh and Phongsaly provinces of northern Laos. MUONA (1991a) noted a new species of *Rhagomicrus* from Vietnam in one of the analysis in his study. Without seeing the specimen, it is possible the Vietnamese specimen may be either of this species, *R. haucki* or *R. tibialis*.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. All adults were taken from a tropical montane deciduous forest.

***Rhagomicrus haucki* sp.nov.**

(Figs 38 and 39)

**Type material.** Male holotype: “LAOS-NE, Houa Phan prov., 20°13′09–19″N 103°59′54″–104°00′03″E, 1480–1550 m, PHOU PANE Mts., 9–16.vi.2009, David Hauck leg.” / “NHMB Basel, NMPC Prague, Laos 2009 Expedition: M. Brancucci, M. Geiser, Z. Kraus, D. Hauck, V. Kubáň” (NHMB)” / “HOLOTYPE, *Rhagomicrus, haucki*, Otto, det. R.L. Otto, 2014” (♂ handwritten behind species name on label) [red printed label]. Holotype is deposited in NHMB.

Paratypes: 2, from the following localities: 1, “MALAYSIA, Elateroidea, Eucnemidae” (yellow printed label glued on large platen board alongside specimen on a smaller board) / “MALAYSIA – Pahang, Banjaran Benom, Lata Jarom, 18.–21.3.1997, Ivo Jeniš leg.” (GERP); 1, “LAOS South, Attapu prov., Bolaven Plateau, 18–30.IV.1999, 15 km SE of Ban Houaykong, NONG LOM (lake) env., N 15°02′ E 106°35′, alt. 800 m, E. Jendek & O. Šauša leg.” (JMC).

Each specimen labeled: “PARATYPE, *Rhagomicrus, haucki*, Otto, det. R.L. Otto, 2014” (♀ handwritten behind species name on label) [yellow printed label]. Paratypes are deposited in GERP and JMC.

**Description.** Male holotype: Length, 3.25 mm. Width, 1.00 mm. Body subcylindrical, elongate and tapering towards the elytral apex; uniformly black, except apical margin of pronotum reddish; antennae black, except part of I and II reddish; femur largely black; apical end of femur, tibiae and tarsi medium brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 38).

*Head:* Very closely punctate, subspherical; frons convex; surface somewhat shiny; apical margin of frontoclypeal region evenly rounded, 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Moderately serrate from antennomeres IV–X; setose; antennomere III longer than IV; antennomeres IV–X subequal, slightly longer than wide; antennomere XI slightly longer than X; extends about half the length of the body.

*Pronotum:* Closely punctate, granulose; surface dull; about as long as wide, with moderate, sharp hind angles; parallel-sided; disc convex; base sinuous, with very short carina above scutellum; anterior lateral pronotal ridge short, slightly directed ventrally; posterior lateral ridge elongate, extends 1/2 the length of pronotum (Fig. 39).

*Scutellum:* Shiny, oblong, sub-triangular and distally rounded.

*Elytra:* Striae absent; interstices flatten with densely punctate to rugose surface.

*Legs:* First tarsomere as long as the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves; hypomeral pits near prothoracic coxae with poorly defined ridges; metathoracic episternum apically widened; metathoracic coxal plates parallel-sided.

**Variation.** Two female paratypes were examined. These paratypes ranged 3.00–4.25 mm long. One female is larger than the holotype. Antennae in both females are lighter than the holotype. Reddish coloration at the base of the pronotum is present in the paratypes, but absent in the holotype. General exoskeletal characteristics are similar to the holotype.

**Etymology.** The specific epithet, *haucki* is named after David Hauck, collector of the holotype specimen.

**Differential diagnosis.** Moderately serrate antennae and shorter posterior lateral pronotal ridge will distinguish *R. haucki* from *R. cylindriformis* and *R. tibialis*.

**Distribution.** A very rare eucnemid species taken from two localities in Laos and a single locality in Malaysia.

**Ecoregion(s).** Northern Indochina subtropical forests, Southern Annamites montaine rain forests.

**Biology.** Developmental stages remain unknown. Adults were taken from a lowland semi-evergreen forest and tropical montane deciduous forest.

***Rhagomicrus tibialis* sp.nov.**

(Figs 40 and 41)

**Type material.** Male holotype: “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), 1300–1900 m, 7.iv.–25.v.2010, 20°12’N, 104°01’E, leg. C. Holzschuh” / “BMNH{E}, 2012-14, C. Holzschuh” / “HOLOTYPE, *Rhagomicrus, tibialis*, Otto, det. R.L. Otto, 2014” (♂ handwritten behind species name on label) [red printed label]. Female allotype: with same label data as holotype / “BMNH{E}, 2012-14, C. Holzschuh” / “ALLOTYPE, *Rhagomicrus, tibialis*, Otto, det. R.L. Otto, 2014” (♀ handwritten behind species name on label) [yellow printed label]. Holotype and allotype are deposited in BMNH.

Paratypes: 6, from the following localities: 6, “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), N20°12’ E104°01’, 1300–1900 m, 11.iv.–15.v.2012” / “BMNH{E}, 2012-14, C. Holzschuh” (BMNH; GERP). Each specimen labeled: “PARATYPE, *Rhagomicrus, tibialis*, Otto, det. R.L. Otto, 2014” (either ♂ or ♀ handwritten behind species name on label) [yellow printed label]. Paratypes are deposited in BMNH and GERP.

**Description.** Male holotype: Length, 3.50 mm. Width, 1.00 mm. Body subcylindrical, elongate and tapering towards the elytral apex; uniformly black, except elytra and apical margin of pronotum reddish; antennae black in basal segment, remaining segments infusate reddish; femur black, tibiae and tarsi reddish; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 40).

*Head:* Very closely punctate, subspherical; frons convex; surface somewhat shiny; apical margin of frontoclypeal region evenly rounded, 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Weakly serrate from antennomeres IV–X; antennomere III slightly longer than IV; antennomeres IV–X subequal, slightly longer than wide; antennomere XI slightly longer than X; extends about half the length of the body.

*Pronotum:* Closely punctate, granulose; surface shiny; about as long as wide, with moderate, sharp hind angles; parallel-sided; disc convex; base sinuous, with slight median groove above scutellum; anterior lateral pronotal ridge short, slightly directed ventrally; posterior lateral ridge elongate, extends 3/4 to nearly towards apical end (Fig. 41).

*Scutellum:* Shiny, oblong, sub-triangular and distally rounded.

*Elytra:* Striae faintly indicated; interstices elevated with dense punctations.

*Legs:* First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section, apically expanded

with hook-like appendage present at lateral side; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter*: Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves; hypomeral pits near prothoracic coxae with poorly defined ridges; metathoracic episternum apically widened; metathoracic coxal plates parallel-sided.

*Allotype*: Length 3.00 mm, width 1.00 mm; same as male except unicolored; antennae shorter and darker; metathoracic tibiae slightly expanded, without lateral hook-like appendage.

**Variation.** Six adult paratypes were examined. The single female paratype is larger than the holotype and allotype, measuring 3.75 mm long. Five male paratypes varied in lengths from 3.50–4.00 mm. All specimens are varied in the elytral colorations. Some specimens have infuscate reddish areas present, especially near the humeri region. Other specimens show a more unicolored dark brown elytra. Antennal coloration is darker in all paratypes compared with the holotype.

**Etymology.** The new species name is derived from its expanded tibiae with the presence of a hook-like appendage on male specimens.

**Differential diagnosis.** Weakly serrate antennae and longer posterior lateral pronotal ridge will distinguish *R. tibialis* from *R. haucki*. Longer than wide antennal segments and expanded tibiae will further distinguish *R. tibialis* from *R. cylindriformis*.

**Distribution.** A rare, endemic eucnemid species taken from a single locality in the Houphanh province of northeastern Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. All adults were taken from a tropical montane deciduous forest.

### ***Siniugum* gen.nov.**

**Type species.** *Siniugum houaphanensis* sp.nov., designated here.

**Diagnosis.** Adult *Siniugum* superficially resemble *Microrhagus*, but differ based on the absence of the posterior lateral pronotal ridge. The absence of sex combs in the male type will also distinguish the group from *Microrhagus*. In general, the absence of the posterior lateral pronotal ridge will distinguish the group from all other groups within the tribe Dirhagini.

**Description.** Male. Body elongate, approximately five times longer than wide, dorsally convex and ventrally well sclerotized.

*Head*: Hypognathus with short, recumbent setae. Antennae weakly serriform with 11 antennomeres, setose; scape four times longer than pedicel; pedicel globular, shorter than antennomere III; antennomere III slightly longer than antennomere IV; antennomeres V–XI each subequal in lengths, two time longer than wide, rounded in cross sectional view. Compound eye round, well developed, small. Antennal groove

present in geni region between base of mandible and compound eye. Frontoclypeal region subtriangular, apically trilobed, about 2.50 times wider apically than the distance between antennal sockets. Mandibles well developed, stout, setose; left mandibles bidentate; right mandible unidentate. Maxillary and labial palpus concealed behind mandibles. Labrum concealed.

*Pronotum*: Subparallel, convex and setose. Lateral sides arcuate. Hind angles well developed. About as long as wide. Anterior lateral pronotal ridge short. Posterior lateral pronotal ridge absent. Disc convex. Base sinuous.

*Scutellum*: Quadrate, subtriangular, distally rounded.

*Elytron*: Elongate, convex, laterally marginate, setose. Disc indistinctly striate. Humeral region shallowly striate. Interstices flattened.

*Legs*: Prothoracic legs shortest, metathoracic legs longest. Prothoracic tibia apically rounded, rounded in cross-section, setose with one apical spur. First prothoracic tarsi without sex combs. Lateral side of mesothoracic and metathoracic tibiae with setae only. Metathoracic tarsi, including claws longer than the tibia. First metathoracic tarsi shorter than combined lengths of remaining four. Metathoracic tarsi I–III simple. Metathoracic tarsi IV excavated-emarginated, wider than III. Metathoracic tarsi V elongate with basally toothed claws. Tarsal formula 5-5-5.

*Venter*: With short, recumbent setae. Prothoracic sternal peg basally broad, short. Notosternal suture shorter than the hypomeral base. Hypomeron with notosternal antennal grooves. Hypomeral pits near prothoracic coxae without distinct ridges along lateral and/or caudal sides. Epipleura not grooved. Metathoracic episterna caudally widened. Metathoracic coxal plate medially 3.00–6.00 times wider than laterally. Tarsal grooves absent on mesothoracic and metathoracic sterna. Abdomen with five visible ventrites, medially convex. Last visible ventrite caudally acute.

**Etymology.** The generic name combines *sin-*, from the Latin *sine*, meaning without, plus the Latin *iugum*, meaning ridge; for the absence of the posterior lateral hypomeral ridge. Gender: neuter.

**Note.** Several species, *Microrhagus derelictus* Bonvouloir, 1871, *Microrhagus affinis* (Fleutiaux, 1932) and *Microrhagus wolffi* (Cobos, 1970) were described as lacking the posterior lateral pronotal ridge in the original descriptions. It is quite possible these species may belong in this group. I have not been able to examine the types first hand during the time of the study. For the time being, they will remain in *Microrhagus*, until a world-wide revision of the group can be done.

***Siniugum houaphanensis* sp.nov.**

(Figs 42 and 43)

**Type material.** Male holotype: “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), 1300–1900 m, 7.iv.–25.v.2010, 20°12'N, 104°01'E, leg. C. Holzschuh” / “BMNH{E}, 2012-14, C. Holzschuh” / “HOLOTYPE, *Siniugum, houaphanensis*, Otto, det. R.L. Otto, 2014” (♂ handwritten behind species name on label) [red printed label]. Holotype is deposited in BMNH.

**Description.** Male holotype: Length, 5.00 mm; width, 1.00 mm; body color uniformly dark brown (Fig. 42).



*Head*: Very closely punctate; subspherical; surface dullish; eyes slightly protuberant; frons convex.

*Antennae*: Weakly serriform, reaching about 3/4 the length of the body; dark brown, except antennomere II reddish.

*Pronotum*: Dark brown, dullish with short, yellow recumbent setae; surfaces with closely spaced punctations to granulose; about as long as wide, with moderate sharp, divergent hind angles; lateral sides parallel-sided, slightly arcuate; disc convex; base sinuous, with short median carina above scutellum; anterior lateral pronotal ridge short, directed slightly ventrally, extends up to 1/4 the length; posterior lateral pronotal ridge absent (Fig. 43).

*Scutellum*: Punctate, reddish, shiny, slightly oblong, sub-triangular and distally rounded.

*Elytron*: Convex, somewhat shiny with short, yellow recumbent setae, dark brown; length 3.25 mm; width 0.75 mm at humeri; humeri shallowly striate; disc indistinctly striate; interstices flattened, closely punctate.

*Legs*: Femur and tibiae dark brown; tarsi medium brown and somewhat shiny; surfaces shallowly punctate, with short, yellow recumbent setae.

*Venter*: Somewhat dullish; dark brown; surface with short, yellow recumbent setae; closely, shallowly punctate.

**Etymology.** The specific epithet is derived from the name of the province, Houaphanh, in which the new species was collected.

**Differential diagnosis.** Smaller eyes will distinguish *S. houaphanensis* from *M. derelictus* and *M. affinis*. Pronotal shape and microsculpture will also distinguish *S. houaphanensis* from *M. wolffi*; that being parallel-sided and punctate in *M. wolffi* and slightly arcuate and granulose with divergent hind angles in the new species.

**Distribution.** A very rare, endemic eucnemid species known from a holotype collected within the Houaphanh province near Ban Saleui of northeastern Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. A single adult was taken from a tropical montane deciduous forest.

### ***Microrhagus* Dejean 1833**

(=*Dirhagus* Latreille, 1834: 130)

(=*Aulacostenus* Motschulsky, 1869: 33, not Marsham, 1853)

(=*Arhagus* Méquignon, 1925: 187, not Fleutiaux, 1921)

(=*Dichodirhagus* Méquignon, 1925: 240)

(=*Emyirhagus* Olexa, 1975: 162)

**Diagnosis.** Dirhagini, with apical margin of frontoclypeal region trilobed and more than twice as wide as the distance between antennal sockets; well developed notosternal antennal grooves present, usually with smooth surfaces; male prothoracic tarsomere I simple, with apical sex combs; metathoracic coxal plates medially 3.00–6.00 times wider than laterally; last visible ventrite either rounded or truncated; poorly defined deep hypomeral pits near prothoracic coxae; interrupted lateral pronotal ridges; lateral

surfaces of mesothoracic and metathoracic tibiae with setae only; male aedeagus dorsoventrally compressed; lateral lobes bilobed and directed dorsocaudad; median lobe simple, deeply and widely bifurcate apically; flagellum complex and tubular.

**Note.** Some of the identifications were made through interpreting translated keys from BONVOULOIR (1872) and FLEUTIAUX (1926, 1947). These identifications were verified through comparing some specimens against descriptions provided by these authors. Remaining identifications were made possible after breaking down a list of all known species from the region and grouping them. These groupings were based on key diagnostic features (*i.e.* caudally widened versus parallel-sided metathoracic episternum and lateral pronotal ridges) found in each species descriptions from a number of references. These information were compared against any unidentified specimens. New species identification was made, when some specimens failed to match with any interpreted published descriptions of species distributed the region.

### Key to the species of *Microrhagus*

- 1 Anterior lateral pronotal ridge elongate. .... 2
- Anterior lateral pronotal ridge short. .... 3
- 2 Elongate setae present at bases of pronotum and elytra as well as along elytral sutures. .... *Microrhagus pavidus* (Motschulsky, 1861)
- Setae short, consistant at bases of pronotum and elytra as well as along elytral sutures. .... *Microrhagus luzonicus* (Fleutiaux, 1926)
- 3 Metathoracic episternum parallel-sided. .... 4
- Metathoracic episternum caudally widened. .... 6
- 4 Dorsum blackish or black and reddish. .... 5
- Dorsum entirely reddish-brown or brown. ....  
..... *Microrhagus minimus* Bonvouloir, 1872
- 5 Pronotal base with short, median carina above scutellum; pronotum parallel-sided, dullish, and closely punctate to granulate. ....  
..... *Microrhagus walkeri* sp.nov.
- Pronotal base without short, median carina above scutellum; pronotum basally wide, shiny, and closely punctate. ....  
..... *Microrhagus entomophthalmoides* sp.nov.
- 6 Antennae either serrate or pectinate. .... 7
- Antennae filiform. .... *Microrhagus rufoantennatus* sp.nov.
- 7 Dorsum reddish or reddish-brown in color. .... 8
- Dorsum black in color. .... 9
- 8 Posterior lateral pronotal ridge extending up to 3/4 the length of pronotum; compound eyes not incised. .... *Microrhagus rufus* sp.nov.
- Posterior lateral pronotal ridge extending nearly entire length of pronotum; compound eyes incised. ....  
..... *Microrhagus bolavenensis* sp.nov.

- 9 Posterior lateral pronotal ridge elongate, extends at least 2/3 the length of the pronotum. .... **10**  
 – Posterior lateral pronotal ridge shorter, extends up to 1/2 the length of the pronotum. .... *Microrhagus posticus* (Fleutiaux, 1926)  
 10 Pronotal base with short carina above scutellum. ....  
 .... *Microrhagus hoabinus* (Fleutiaux, 1938)  
 – Pronotal base with short groove above scutellum. ....  
 .... *Microrhagus inconsultus* Bonvouloir, 1872

***Microrhagus bolavenensis* sp.nov.**

(Figs 44 and 45)

**Type material.** Female holotype: “LAOS South, Attapu prov., Bolaven Plateau, 18–30.IV.1999, 15 km SE of Ban Houaykong, NONG LOM (lake) env., N 15°02' E 106°35', alt. 800 m, E. Jendek & O. Šauša leg.” / “HOLOTYPE, *Microrhagus bolavenensis*, Otto, det. R.L. Otto, 2014” (♀ handwritten behind species name on label) [red printed label]. Holotype is deposited in JMC.

**Description.** Female holotype: Length, 4.50 mm. Width, 1.50 mm. Body subcylindrical, elongate and tapering towards the elytral apex; uniformly reddish-brown; antennae and legs reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 44).

*Head:* Shallowly punctate, subspherical; frons without carina or sulcus; surface shiny; apical margin of frontoclypeal region weakly trilobed, 2.00 times wider than base; compound eyes incised.

*Antennae:* Weakly serrate from antennomeres III–VII; antennomere III longer than IV; antennomere IV shorter than V; antennomeres V–VII subequal, slightly longer than wide; right antennomeres VIII–XI missing; left antennomeres IV–XI missing.

*Pronotum:* Closely, shallowly punctate; surface shiny; quadrate, with moderate, sharp hind angles; parallel-sided; disc convex; base sinuous, with median carina above scutellum; anterior lateral pronotal ridge short, angulated, directed postero-ventrally; posterior lateral ridge elongate, extends entire length of pronotum (Fig. 45).

*Scutellum:* Shiny, short, sub-triangular and distally rounded.

*Elytra:* Striae indistinct, except along suture; interstices flattened with shallow punctations.

*Legs:* First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with caudally widened notosternal antennal grooves; metathoracic episternum caudally widened; metathoracic coxal plates medially 3.00–6.00 times wider than laterally.

**Etymology.** The specific epithet is derived from the Bolaven Plateau in the Attapeu province from which the new species was taken.

**Differential diagnosis.** *Microrhagus bolavenensis* is superficially similar to *Entomophthalmus* and *Brevisegmentus*. Generic characteristics will distinguish *M. bolavenensis* from either two groups. Within *Microrhagus*, presence of incised

compound eyes will further distinguish the new species from all known species present in Laos.

**Distribution.** A very rare, endemic eucnemid species known from a holotype collected in southern Laos.

**Ecoregion(s).** Southern Annamites montaine rain forests.

**Biology.** Developmental stages remain unknown. A single adult was taken from a lowland semi-evergreen forest.

***Microrhagus entomophthalmoides* sp.nov.**

(Figs 46 and 47)

**Type material.** Male holotype: “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), 1300–1900 m, 7.iv.–25.v.2010, 20°12’N, 104°01’E, leg. C. Holzschuh” / “BMNH{E}, 2012-14, C. Holzschuh” / “HOLOTYPE, *Microrhagus, entomophthalmoides*, Otto, det. R.L. Otto, 2014” (♂ handwritten behind species name on label) [red printed label]. Female allotype: with same label data as holotype / “BMNH{E}, 2012-14, C. Holzschuh” / “ALLOTYPE, *Microrhagus, entomophthalmoides*, Otto, det. R.L. Otto, 2014” (♀ handwritten behind species name on label) [yellow printed label]. Holotype and allotype are deposited in BMNH.

Paratypes: 5, from the following localities: 2, “Collection Naturhistorisches Museum Basel” / “LAO, Phongsaly prov., 21°41–2’N 102°06–8’E, 28.v.–20.vi.2003, PHONGSALY env., ~1500 m, Vít Kubáň leg.” (NHMB); 1, “LAO, Phongsaly prov., 21°41–2’N 102°06–8’E, 28.v.–20.vi.2003, PHONGSALY env., ~1500 m, Brancucci leg.” (NHMB); 1, “Laos-NE, Houa Phan prov., 20°13’09–19’N 103°59’54”–104° 00’03”E, 1480–1550 m, PHOU PANE Mt., 1.–16.vi.2009, Zdeněk Kraus leg.” / “NHMB Basel, NMPC Prague, Laos 2009 Expedition: M. Brancucci, M. Geiser, Z. Kraus, D. Hauck, V. Kubáň” (NHMB); 1, “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), 1300–1900 m, 7.iv.–25.v.2010, 20°12’N, 104°01’E, leg. C. Holzschuh” / “BMNH{E}, 2012-14, C. Holzschuh” (GERP).

Each specimen labeled: “PARATYPE, *Microrhagus, entomophthalmoides*, Otto, det. R.L. Otto, 2014” (either ♂ or ♀ handwritten behind species name on label) [yellow printed label]. Paratypes are deposited in GERP and NHMB.

**Description.** Male holotype: Length, 3.50 mm. Width, 1.00 mm. Body subcylindrical, elongate and tapering towards the elytral apex; uniformly dark brown-black, except apical margin of pronotum and scutellum reddish; antennae infuscate reddish; femur dark reddish-brown, tibiae and tarsi reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 46).

*Head:* Very closely punctate, subspherical; frons convex; surface somewhat shiny; apical margin of frontoclypeal region weakly trilobed, 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Weakly serrate to filiform from antennomeres III–X; setose; antennomeres III–XI subequal in length, longer than wide; extends about 3/4 the length of its body.

*Pronotum:* Closely punctate; surface shiny; about as long as wide, with moderate, sharp hind angles; parallel-sided, basally wider; disc convex; base sinuous, with small, median carina above scutellum; anterior lateral pronotal ridge short, slightly directed ventrally; posterior lateral ridge elongate, extends nearly the entire length of pronotum (Fig. 47).

*Scutellum:* Shiny, oblong, sub-triangular and distally rounded.

*Elytra:* Striae absent; interstices flattened with dense punctations.

*Legs:* First tarsomere as long as the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic

tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter*: Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves; hypomeral pits near prothoracic coxae with poorly defined ridges; metathoracic episternum parallel-sided; metathoracic coxal plates medially 3.00–6.00 times wider than laterally.

*Allotype*: Length 4.00 mm, width 1.25 mm; same as male except antennae are shorter, barely reaching towards elytral humeri. Antennomeres IV–X each slightly more serrate.

**Variation.** Five adult paratypes were examined. The single female paratype is subequal in length but slightly narrower than the allotype, measuring 1.00 mm wide. Four male paratypes varied in lengths from 3.00–4.00 mm and widths from 1.00–1.25 mm. Infusate reddish coloration along apical pronotal margin and scutellum showed some variability among all paratypes. The female paratype has a stronger infusate reddish coloration compared to all the males, which have a darker colored scutellum and a very narrow band along the apical margin. Dark, blackish colored antennae are present in all male paratypes, while the female has infusate reddish antennae, similar to both the holotype and allotype. No other exoskeletal differences can be found between all specimens.

**Etymology.** The specific epithet is derived from its overall appearance of the species resembling a melasine eucnemid group, *Entomophthalmus* Bonvouloir, 1871.

**Differential diagnosis.** Filiform antennae will distinguish *M. entomophthalmoides* from all other Laotian *Microrhagus* species.

**Distribution.** A rare, endemic eucnemid species known from several localities in Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. All adults were taken from a tropical montane deciduous forest.

### *Microrhagus hoabinus* (Fleutiaux, 1938)

(Figs 48 and 49)

*Dirrhagus hoabinus* Fleutiaux 1938: 209–210.

**Material examined.** One specimen was available for study: “Laos-NE, Xieng Khouang prov., 19°37–8′N 103°20–1′E, 30 km NE Phonsavan: Ban Na Lam → Phou Sane Mt., 1300–1700 m, 10.–30.v.2009, M. Geiser leg.” / “NHMB Basel, NMPC Prague, Laos 2009 Expedition: M. Brancucci, M. Geiser, Z. Kraus, D. Hauck, V. Kubáň” (NHMB).

**Redescription.** Length, 3.75 mm. Width, 1.00 mm. Body subcylindrical, elongate and tapering towards the elytral apex; uniformly black; antennae black, except antennomere II reddish; legs dark reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae; elongate setae more apparent on basal half of pronotum, elytral humeri and along elytral suture (Fig. 48).

*Head*: Closely punctate, subspherical; frons convex; surface shiny; apical margin of frontoclypeal region weakly trilobed, 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Male antennae pectinate from antennomeres IV–X; antennomeres III triangular, as long as the combined lengths of IV and V; antennomere II shorter than IV; ramus on antennomere IV slightly shorter than V, ramus on antennomere V slightly shorter than VI; rami on antennomeres VI–X subequal; antennomere XI longer than X.

*Pronotum:* Densely, shallowly punctate; surface shiny; about as long as wide, with moderate, sharp hind angles; basal 3/4 parallel-sided, apical 1/4 arcuate; disc convex; base sinuous, with very short carina above scutellum; anterior lateral pronotal ridge short, directed posteriorly; posterior lateral ridge elongate, extends about 2/3 the length of the pronotum (Fig. 49).

*Scutellum:* Shiny, oblong, sub-triangular and distally rounded.

*Elytra:* Striae absent; interstices flattened with dense punctations; rugose near humeri.

*Legs:* First tarsomere as long as the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with parallel-sided notosternal antennal grooves; hypomeral pits near prothoracic coxae with poorly defined ridges; metathoracic episternum caudally widened; metathoracic coxal plates medially 1.20–2.00 times wider than laterally.

**Differential diagnosis.** Presence of elongate setae at the base of the pronotum, elytral humeri and along the elytral sutures will distinguish *M. hoabinus* from all known *Microrhagus* species in Laos, except *M. pavidus* and *M. posticus*. Posterior lateral pronotal ridge will further distinguish *M. hoabinus* from *M. pavidus* and *M. posticus*, that being elongate in *M. hoabinus* and shorter in *M. pavidus* and *M. posticus*.

**Distribution.** A very rare eucnemid species previously known from Vietnam. The species was taken for the first time in Laos.

**Ecoregion(s).** Luang Prabang montane rain forests.

**Biology.** Developmental stages remain unknown. A single adult was taken from a tropical montane deciduous forest.

### *Microrhagus inconsultus* Bonvouloir, 1872

(Figs 50 and 51)

**Material examined.** One specimen was available for study: “Laos-NE, Xieng Khouang prov., 19°37–8′N 103°20–1′E, 30 km NE Phonsavan: Ban Na Lam → Phou Sane Mt., 1300–1700 m, 10.–30.v.2009, M. Geiser leg.” / “NHMB Basel, NMPC Prague, Laos 2009 Expedition: M. Brancucci, M. Geiser, Z. Kraus, D. Hauck, V. Kubáň” (NHMB).

**Redescription.** Length, 4.00 mm. Width, 1.00 mm. Body subcylindrical, elongate and tapering towards the elytral apex; uniformly black; antennae black, except antennomere II reddish; legs dark reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 50).

*Head:* Closely punctate to rugose, subspherical; frons convex; surface shiny; apical margin of frontoclypeal region weakly trilobed, 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Much of the antennae were missing in the examined specimen. From any remaining segments available to examine: antennomeres V–VI are pectinate; antennomere III longer than combined lengths of IV and V; antennomere IV as long as II.

*Pronotum:* Densely, closely punctate; surface dullish; about as long as wide, with moderate, sharp hind angles; basal 3/4 parallel-sided, apical 1/4 arcuate; disc convex; base sinuous, with very short, shallow groove above scutellum; anterior lateral pronotal ridge short, directed posteriorly; posterior lateral ridge elongate, extends about 3/4 the length of the pronotum (Fig. 51).

*Scutellum:* Dull, wide, sub-triangular and distally rounded.

*Elytra:* Striae faintly indicated; interstices flattened with dense punctations.

*Legs:* First tarsomere longer than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with caudally widened notosternal antennal grooves; hypomeral pits near prothoracic coxae with poorly defined ridges; metathoracic episternum caudally widened; metathoracic coxal plates medially 1.20–2.50 times wider than laterally.

**Differential diagnosis.** *Microrhagus inconsultus* can be distinguished from *M. luzonicus* by its closely punctate surface of the pronotum and head, as well as the posterior lateral ridge reaching about 3/4 the length of the pronotum. Caudally widened metathoracic episternum will further distinguish *M. inconsultus* from *M. luzonicus*.

**Distribution.** A very rare eucnemid species previously known from Sri Lanka. The species was taken for the first time in Laos.

**Ecoregion(s).** Luang Prabang montane rain forests.

**Biology.** Developmental stages remain unknown. A single adult was taken from a tropical montane deciduous forest.

### *Microrhagus luzonicus* (Fleutiaux, 1926)

(Figs 52 and 53)

*Dirhagus luzonicus* Fleutiaux 1926: 82

**Material examined.** Two specimens were available for study: 1, “C. LAOS, Boli Khan Xai prov., Ban Nape (8 km NE), 1–18.5.2001, P. Pacholátko leg.” (GERP); 1, “LAOS-N (Louangphrabang), 11–21.v.2002, 19°35′N 101°58′E, THONG KHAN, ~750 m, Vít Kubán leg.” (GERP).

**Redescription.** Length, 5.00 mm. Width, 1.25 mm. Body subcylindrical, elongate and tapering towards the elytral apex; uniformly dark brown, except apical margin of pronotum reddish; antennae dark brown-black, except antennomeres II and XI apically reddish; legs reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 52).

*Head:* Granulose, subspherical; frons convex; surface dull; apical margin of frontoclypeal region evenly rounded, 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Pectinate from antennomeres IV–X, extends 3/4 the length of its body; antennomere IV ramus about half as long as V; antennomere V ramus 2/3 as long as VI; antennomere VI ramus slightly shorter than VII; antennomere VII–X rami subequal in length; antennomeres IV–X subequal, longer than wide.

*Pronotum:* Granulose; surface dull; slightly longer than wide, with moderate, sharp hind angles; basal 3/4 parallel-sided, apical 1/4 arcuate; disc convex; base sinuous; anterior lateral pronotal ridge elongate, reaching 1/3 the length, slightly directed ventrally; posterior lateral ridge elongate, extends nearly entire length of pronotum (Fig. 53).

*Scutellum:* Dull, oblong, sub-triangular and distally rounded.

*Elytra:* Striae absent; interstices flattened with dense to rugose punctations.

*Legs:* First tarsomere as long as the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves; hypomeral pits near prothoracic coxae with poorly defined ridges; metathoracic episternum parallel-sided; metathoracic coxal plates medially 1.20–2.50 times wider than laterally.

**Differential diagnosis.** *Microrhagus luzonicus* can be distinguished from *M. inconsultus* by its granulose surface of the pronotum and head, as well as the elongate posterior lateral ridge reaching near the apical end of the pronotum. Parallel-sided metathoracic episternum will further distinguish *M. luzonicus* from *M. inconsultus*. The eucnemid species also differ from the Southeast Asian *Microrhagus bruckii* Bonvouloir, 1872 by its posterior lateral pronotal ridge; that being elongate and reaching near apical end in *M. luzonicus* and shorter, about 1/2 to 2/3 the length of the pronotum in *M. bruckii*.

**Distribution.** A very rare eucnemid species previously known from the Philippines. The species was taken for the first time in Laos.

**Ecoregion(s).** Northern Annamites rain forests, Northern Thailand-Laos moist deciduous forests.

**Biology.** Developmental stages remain unknown. Adults were taken from a dry evergreen forest and lowland semi-evergreen forest.

### *Microrhagus minimus* Bonvouloir, 1872

(Figs 54 and 55)

**Material examined.** Three specimens were available for study: 1, “LAOS, 21°09’N 101°19’E, Louangnamtha pr., Namtha → Muang Sing, 5–31.v.1997, 900–1200m, Vít Kubáň leg.” (JMC); 1, “LAOS centr., Khammouan prov., NAKAI env., 17°43’N, 105°09’E, 22.V.–8.VI.2001, alt. 500–600 m, E. Jendek & O. Šauša lgt.” (GERP); 1, “LAOS c., Khammouan prov., NAKAI env., 4–8.V.1998, Route No. 8, alt. 560m, N17°42.8’, E105°09.1’ GPS, E. Jendek & O. Šauša lgt.” (GERP).

**Redescription.** Length, 2.25–3.00 mm. Width, 0.75–1.00 mm. Body subcylindrical, elongate and tapering towards the elytral apex; uniformly reddish-brown; antennae and legs reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 54).



*Head:* Closely and shallowly punctate, subspherical; frons convex; surface somewhat shiny; apical margin of frontoclypeal region weakly trilobed, 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Weakly serrate from antennomeres III–XI; setose; antennomeres III slightly longer than IV; antennomeres IV–X subequal, quadrate; extends 1/2 the length of its body.

*Pronotum:* Closely punctate; surface shiny; about as long as wide, with moderate, sharp hind angles; parallel-sided; disc convex; base sinuous; anterior lateral pronotal ridge short, slightly directed ventrally; posterior lateral ridge elongate, extends nearly entire length of pronotum (Fig. 55).

*Scutellum:* Dull, oblong, sub-triangular and distally rounded.

*Elytra:* Striae punctate; interstices flattened with dense punctations.

*Legs:* First tarsomere as long as the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves; hypomeral pits near prothoracic coxae with poorly defined ridges; metathoracic episternum parallel-sided; metathoracic coxal plates medially 1.20–2.50 times wider than laterally.

**Differential diagnosis.** The eucnemid species can be distinguished from *M. rufus* by its notosternal antennal grooves; that being caudally parallel-sided in *M. minimus* and caudally widened in *M. rufus*. Metaepisternum will also distinguish these two species; that being parallel-sided in *M. minimus* and caudally widened in *M. rufus*.

**Distribution.** A very rare eucnemid species previously known from Indonesia. The species was taken for the first time in Laos.

**Ecoregion(s).** Northern Annamites rain forests, Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. All adults were taken from a dry evergreen forest and tropical montane evergreen forest.

### *Microrhagus pavidus* (Motschulsky, 1861)

(Figs 56 and 57)

*Aulacosternus pavidus* Motschulsky 1861: 24.

**Material examined.** One specimen was available for study: “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), N20°12' E104°01', 1300–1900 m, 11.iv.–15.v.2012” / “BMNH{E}, 2012-14, C. Holzschuh” (BMNH).

**Redescription.** Length, 4.00 mm. Width, 1.00 mm. Body subcylindrical, elongate and tapering towards the elytral apex; uniformly black; antennae black, except antennomeres II and XI apically reddish; femur and tibiae dark reddish-black; tarsi reddish; head, pronotum and elytra clothed with short, yellowish recumbent setae; elongate setae more apparent on basal half of pronotum, elytral humeri and along elytral suture (Fig. 56).

*Head:* Closely punctate, subspherical; frons convex; surface somewhat shiny; apical margin of frontoclypeal region weakly trilobed, 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Serrate from antennomeres III–X, reaching about 3/4 the length of its body; antennomere III longer than IV; antennomere IV slightly shorter than V; antennomeres V–X subequal, longer than wide; antennomere XI slightly longer than X.

*Pronotum:* Densely and shallowly punctate; surface somewhat shiny; about as long as wide, with shorter, sharp hind angles; basal 2/3 parallel-sided, apical 1/3 arcuate; disc convex, with median circular fovea; base sinuous, with slightly elevated median carina above scutellum; anterior lateral pronotal ridge elongate, directed ventrally; posterior lateral pronotal ridge elongate, extends up to 1/2 the length (Fig. 57).

*Scutellum:* Punctate, short, sub-triangular and distally rounded.

*Elytra:* Striae present at humeri only, remaining areas without striae; interstices slightly elevated at humeri, flattened elsewhere with closely punctate to rugose surfaces.

*Legs:* First tarsomere as long as the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves; hypomeral pits near prothoracic coxae with poorly defined ridges; metathoracic episternum apically widened; metathoracic coxal plates medially 3.00–6.00 times wider than laterally.

**Differential diagnosis.** Presence of elongate setae at the base of the pronotum, elytral humeri and along the elytral sutures will distinguish *M. pavidus* from all known *Microrhagus* species in Laos, except *M. posticus* and *M. hoabinus*. Posterior lateral pronotal ridge will further distinguish *M. pavidus* from *M. hoabinus*; that being shorter in *M. pavidus* and elongate in *M. hoabinus*. Laterally narrow pronotal hind angles and elongate anterior pronotal ridge will distinguish the species from *M. posticus*.

**Distribution.** A very rare eucnemid species previously found in the Sri Lanka. The species was taken for the first time in Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. One adult was taken from a tropical montane deciduous forest.

***Microrhagus posticus* (Fleutiaux, 1926)**

(Figs 58 and 59)

*Dirhagus posticus* Fleutiaux 1926: 81–82.

**Material examined.** Four specimens were available for study: 1, “LAOS-N (Oudomxai), 1–9.v.2002, ~1100 m, 20°45′N 102°09′E, OUDOM XAI (17 km NEE), Vít Kubáň leg.” (JMC); 1, “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), 1300–1900 m, 7.iv.–25.v.2010, 20°12′N, 104°01′E, leg. C. Holzschuh” / “BMNH{E}, 2012-14, C. Holzschuh” (BMNH); 2, “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), N20°12′ E104°01′, 1300–1900 m, 11.iv.–15.v.2012” / “BMNH{E}, 2012-14, C. Holzschuh” (BMNH).

**Redescription.** Length, 3.25–4.00 mm. Width, 1.00–1.25 mm. Body subcylindrical, elongate and tapering towards the elytral apex; uniformly dark brown-black; antennae black, except antennomeres II and XI apically reddish; legs medium-dark brown, tarsi medium brown; head, pronotum and elytra clothed with short, yellowish recumbent

setae; elongate setae more apparent on basal half of pronotum, elytral humeri and along elytral suture (Fig. 58).

*Head:* Very closely punctate, subspherical; frons convex; surface somewhat shiny; apical margin of frontoclypeal region weakly trilobed, 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Serrate from antennomeres IV–X; males strongly serrate, females weakly serrate; extends just beyond elytral humeri; antennomere III slightly longer than IV; antennomeres IV–X subequal, about as long as wide; antennomere XI slightly longer than X.

*Pronotum:* Closely punctate; surface shiny; about as long as wide, with moderate, sharp hind angles; basal 3/4 parallel-sided, apical 1/4 arcuate; disc convex; base sinuous, with median carina above scutellum; anterior lateral pronotal ridge short, slightly directed ventrally; posterior lateral ridge short, extends nearly half the length (Fig. 59).

*Scutellum:* Shiny, oblong, sub-triangular and distally rounded.

*Elytra:* Striae absent; interstices flattened with dense punctations.

*Legs:* First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves; hypomeral pits near prothoracic coxae with poorly defined ridges; metathoracic episternum apically widened; metathoracic coxal plates medially 1.20–2.00 times wider than laterally.

**Differential diagnosis.** Presence of elongate setae at the base of the pronotum, elytral humeri and along the elytral sutures will distinguish *M. posticus* from all known *Microrhagus* species in Laos, except *M. pavidus* and *M. hoabinus*. Posterior lateral pronotal ridge will further distinguish *M. posticus* from *M. hoabinus*; that being shorter in *M. posticus* and elongate in *M. hoabinus*. Shorter anterior pronotal ridge will also distinguish *M. posticus* from *M. pavidus*.

**Distribution.** A very rare eucnemid species previously found in the Philippines. The species was taken for the first time in Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. Adults were taken from a dry evergreen forest and tropical montane deciduous forest.

***Microrhagus rufoantennatus* sp.nov.**

(Figs 60 and 61)

**Type material.** Male holotype: “Collection Naturhistorisches Museum Basel” / “LAOS-N (Oudomxai), 1–9.v.2002, ~1100 m, 20°45′N 102°09′E, OUDOM XAI (17 km NEE), Vít Kubáň leg.” / “HOLOTYPE, *Microrhagus, rufoantennatus*, Otto, det. R.L. Otto, 2014” (♂ handwritten behind species name on label) [red printed label]. Holotype is deposited in NHMB.

Paratype: 1, from the following locality: “LAOS north, 13–24.V.1997, 15 km NW Louang Namtha, N21°07.5′, E101°21.0′, alt 750 ±100 m, E. Jendek & O. Šauša leg.” / “PARATYPE, *Microrhagus, rufoantennatus*, Otto, det. R.L. Otto, 2014” (♂ handwritten behind species name on label) [yellow printed label]. Paratype is retained in GERP.

**Description.** Male holotype: Length, 4.00 mm. Width, 1.00 mm. Body parallel-sided, elongate, tapering towards apex; uniformly black, except pronotal apices and base, hind angles, elytral base as well as scutellum infusate reddish; antennae infusate reddish; femur dark brown; tibiae and tarsi medium brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 60).

*Head:* Shallowly punctate, subspherical; frons convex; surface shiny; apical margin of frontoclypeal region weakly trilobed, 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Filiform from antennomeres III–XI, setose, reaching  $\frac{3}{4}$  the length of its body; antennomere III slightly longer than IV; antennomere IV longer than II; antennomeres IV–X subequal, slightly longer than wide; antennomere XI longer than X.

*Pronotum:* Shallowly punctate; surface shiny; slightly wider than long, with moderate, sharp hind angles; lateral sides parallel-sided, apically arcuate; disc convex; base sinuous, with very short median carina above scutellum; anterior lateral pronotal ridge short, slightly directed ventrally; posterior lateral ridge elongate, extending almost entire length of pronotum (Fig. 61).

*Scutellum:* Shiny, oblong, sub-triangular and distally rounded.

*Elytra:* Striae absent; interstices flattened with dense to rugose punctations.

*Legs:* First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves; hypomeral pits near prothoracic coxae without well defined ridges; metathoracic episternum caudally widened; metathoracic coxal plates medially 3.00–6.00 times wider than laterally.

**Variation.** One adult paratype was examined. The single male paratype is subequal in length compared with the holotype. The paratype is more unicolored, losing the infusate reddish coloration along the base of the pronotum and elytra as well as the scutellum. Antennomere III is slightly elongate in the paratype in relation to antennomere IV, compared with the antennal segments in the holotype.

**Etymology.** The specific epithet is derived from its reddish colored antennae present in the new species.

**Differential diagnosis.** Reddish colored filiform antennae, parallel-sided pronotum and caudally widened matathoracic episternum will distinguish *M. rufoantennatus* from *M. entomophthalmoides*.

**Distribution.** A very rare, endemic eucnemid species known from two localities in northern Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. All adults were taken from a dry evergreen forest.

***Microrhagus rufus* sp.nov.**

(Figs 62 and 63)

**Type material.** Female holotype: “LAO-NE, Hua Phan prov., 20°12' N 104°01'E, PHU PHAN Mt., ~1750 m, 17.v.–3.vi.2007, Vit. Kubáň leg” / “NHMB Basel, expedition to Laos, 2007” / “HOLOTYPE, *Microrhagus rufus*, Otto, det. R.L. Otto, 2014” (♀ handwritten behind species name on label) [red printed label]. Holotype is deposited in NHMB.

Paratype. 1, from the following locality: “LAOS, 1–9.v.1999, Louangphrabang pr., 20°33–4'N, 102°14'E, Ban Song Cha (5 km W), 1200 m, Vit Kubáň leg.” / “PARATYPE, *Microrhagus rufus*, Otto, det. R.L. Otto, 2014” (♀ handwritten behind species name on label) [yellow printed label]. Paratype is deposited in JMC.

**Description.** Female holotype: Length, 4.00 mm. Width, 1.25 mm. Body subcylindrical, elongate and tapering towards the elytral apex; uniformly reddish-brown; antennae and legs reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 62).

*Head:* granulate, subspherical; frons with small, round tubercle; vertex with fine, shallow groove; surface dullish; apical margin of frontoclypeal region weakly trilobed, 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Serrate from antennomeres IV–X, extends up to elytral humeri; antennomeres III longer than IV; antennomere IV as long as II, shorter than V; antennomeres V–X subequal, as long as wide; antennomere XI slightly longer than X.

*Pronotum:* Closely punctate, almost granulate; surface dullish; slightly longer than wide, with moderate, sharp hind angles; parallel-sided, basally wider, arcuate cranially; disc convex; base sinuous, with median carina above scutellum; anterior lateral pronotal ridge short, angulated, directed ventrally; posterior lateral ridge elongate, extends 3/4 the length of pronotum (Fig. 63).

*Scutellum:* Dull, oblong, sub-triangular and distally rounded.

*Elytra:* Striae somewhat indicated, moreso at humeri; interstices slightly elevated with rugose to dense punctations.

*Legs:* First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with caudally widened notosternal antennal grooves, lateral ridge caudally incomplete; hypomeral pits near prothoracic coxae indistinct; metathoracic episternum caudally widened; metathoracic coxal plates medially 1.20–2.50 times wider than laterally.

**Variation.** One adult paratype was examined. The single female paratype is 4.25 mm in length, slightly larger than the holotype. There are no discernable morphological and exoskeletal differences between the holotype and paratype.

**Etymology.** The specific epithet is derived from the overall reddish coloration of the species.

**Differential diagnosis.** *Microrhagus rufus* can be distinguished from *M. minimus* by its notosternal antennal grooves; that being caudally widened in *M. rufus* and caudally parallel-sided in *M. minimus*. Metathoracic episternum will also distinguish these two species; that being caudally widened in *M. rufus* and parallel-sided in *M. minimus*.

**Distribution.** A very rare, endemic eucnemid species known from two localities in northern and northeastern Laos.

**Ecoregion(s).** Luang Prabang montane rain forests, Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. Adults were taken from a dry evergreen forest and tropical montane deciduous forest.

*Microrhagus walkeri* sp.nov.

(Figs 64 and 65)

**Type material.** Male holotype: “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), 1300–1900 m, 7.iv.–25.v.2010, 20°12′N, 104°01′E, leg. C. Holzschuh” / “BMNH{E}, 2012-14, C. Holzschuh” / “HOLOTYPE, *Microrhagus, walkeri*, Otto, det. R.L. Otto, 2014” (♂ handwritten behind species name on label) [red printed label]. Holotype is deposited in BMNH.

Paratype. 1, from the following locality: “MALAYSIA West, PAHANG, Cameron Highlands, TANAH RATA, 1200–1500 m, 3.ii–19.ii.2005, Cechovsky Petr lgt.” / “PARATYPE, *Microrhagus, walkeri*, Otto, det. R.L. Otto, 2014” (♂ handwritten behind species name on label) [yellow printed label]. Paratype is retained in GERP.

**Description.** Male holotype: Length, 4.00 mm. Width, 1.00 mm. Body subcylindrical, elongate and tapering towards the elytral apex; uniformly dark brown-black with apical margin of pronotum reddish; antennae black, except antennomere II reddish; legs dark brown to black, tarsi medium brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 64).

*Head:* Very closely punctate, subspherical; frons convex; surface somewhat dullish; apical margin of frontoclypeal region evenly rounded, 2 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Flabellate from antennomeres V–X with very elongate rami, reaching close to the elytral humeri; antennomere III nearly as long as the combined lengths of IV–VI; antennomere IV serrate, triangular-shaped; antennomere XI elongate.

*Pronotum:* Very closely punctate to rugose; surface somewhat dullish; about as long as wide, with moderate, sharp hind angles; sides parallel-sided; disc convex; base sinuous; anterior lateral pronotal ridge short, slightly directed ventrally; posterior lateral pronotal ridge elongate, extends nearly entire length of pronotum (Fig. 65).

*Scutellum:* Shiny, oblong, sub-triangular and distally rounded.

*Elytra:* Striae absent; interstices flattened; surfaces rugose nearest humeral region.

*Legs:* First tarsomere longer than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with basally swollen, simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves, medial ridge poorly developed; hypomeral pits near prothoracic coxae with poorly defined ridges; metathoracic episternum parallel-sided; metathoracic coxal plates medially 3.00–6.00 times wider than laterally.

**Variation.** One male paratype was examined. The single paratype is shorter than the holotype; measuring 3.50 mm long. Antennal rami are lighter brown in color compared to the holotype. No other exoskeletal differences can be found between these two types.

**Etymology.** The specific epithet is dedicated in memory of a favorite American actor, Paul Walker, best known for his acting roles in the “Fast and Furious” series of movies and many other films, who has entertained us for many years. He was tragically killed in an automobile accident in November 2013.

**Differential diagnosis.** Unique antennal structures will distinguish *M. walkeri* from all known species in Laos. *Microrhagus walkeri* is similar to oceanic *Microrhagus sexramosus* (Fleutiaux, 1931) and Asian *Microrhagus pennatus* (Fleutiaux, 1926). *Microrhagus walkeri* differs in the overall length and shape of the anterior lateral hypomerical ridge; that being extremely short, directed ventrally in *M. sexramosus* and elongate, directed posteriorly in *M. walkeri*. The new species also differ from *M. pennatus* by the form of antennomere IV; that being short and triangular in *M. walkeri* and elongate in *M. pennatus*.

**Distribution.** A very rare eucnemid species known from single localities in both Laos and Malaysia.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. A single adult was taken from a tropical montane deciduous forest.

### *Dirrhagofarsus* Fleutiaux, 1935

(= *Attenurhagus* Olexa, 1975: 161)

**Diagnosis.** Dirrhagini, with apical margin of frontoclypeal region fairly evenly rounded and more than twice as wide as the distance between antennal sockets; hypomerical with notosternal antennal grooves; serrate antennae; male prothoracic tarsomere I simple, without sex combs; metathoracic coxal plates medially 3.00–6.00 times wider than laterally; last visible ventrite produced; simple tarsal claws; lateral surfaces of mesothoracic and metathoracic tibiae with setae only; male aedeagus dorsoventrally compressed; with secondary lateral lobes; lateral lobes simple, apices directed medially; median lobe simple, deeply and widely bifurcate apically; flagellum complex and tubular.

#### *Dirrhagofarsus foveicollis* sp.nov.

(Figs 66 and 67)

**Type material.** Female holotype: “LAO-NE, Hua Phan prov., ~20°12' N 104°01'E, PHU PHAN Mt., 1500–1900 m, 17.v.–3.vi.2007, M. Brancucci leg” / “NHMB Basel, expedition to Laos, 2007” / “HOLOTYPE, *Dirrhagofarsus, foveicollis*, Otto, Det. R.L. Otto, 2014” (♀ handwritten behind species name on label) [red printed label]. Holotype is deposited in NHMB.

**Description.** Female holotype: Length, 9.00 mm. Width, 2.25 mm. Body subcylindrical, elongate; uniformly dark brown; antennae dark brown; femur, tibiae and tarsi dark reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 66).

*Head:* Very closely punctate; frons with lateral ridges, fovea above frontoclypeal region and pair of circular foveae near occipital area; surface somewhat shiny; apical

margin of frontoclypeal region evenly rounded, about 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae*: Weakly serrate from antennomeres IV–X, reaching almost 1/2 the length of its body; setose; antennomere III slightly longer than IV; antennomeres IV–X each longer than wide, subequal, weakly serrate; antennomere XI slightly longer than X.

*Pronotum*: Closely punctate to rugose; surface somewhat shiny; slightly longer than wide, with moderate, sharp hind angles; lateral sides parallel-sided; disc with small fovea near anterior end; base sinuous, with elongate carina above scutellum; anterior lateral pronotal ridge short, directed ventrally; posterior lateral pronotal ridge short, extends 1/2 the length of pronotum (Fig. 67).

*Scutellum*: Shiny, oblong, sub-triangular and distally rounded.

*Elytra*: Slightly striate, moreso near elytral humeri; interstices slightly elevated, surfaces closely punctate to rugose.

*Legs*: First tarsomere as long as the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter*: Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves; metathoracic episternum parallel-sided; metathoracic coxal plates medially 2.50–3.00 times wider than laterally.

**Etymology.** The name of the new species is derived from a pair of circular foveae present on the frons.

**Differential diagnosis.** Larger size, along with presence of fovea on the frons will distinguish *D. foveicollis* from any known Asian species of *Dirrhagofarsus*.

**Distribution.** A very rare, endemic eucnemid species known from a holotype collected in Northeastern Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. A single adult was taken from a tropical montane deciduous forest.

### ***Rhacopus* Hampe, 1855**

(= *Pseudorhacopus* Olexa, 1975: 160)

**Diagnosis.** Dirrhagini, with apical margin of frontoclypeal region fairly evenly rounded and less than twice as wide as the distance between antennal sockets; hypomeron with notosternal antennal grooves; pectinate or serrate antennae; male prothoracic tarsomere I simple, with straight, apical sex combs; metathoracic coxal plates medially 3.00–6.00 times wider than laterally; last visible ventrite either rounded or produced; simple tarsal claws; lateral surfaces of mesothoracic and metathoracic tibiae with setae only; male aedeagus dorsoventrally compressed; without secondary lateral lobes; lateral lobes simple, entire, apices directed ventrad; median lobe simple, deeply and widely bifurcate apically; flagellum complex and tubular.



***Rhacopus olexai* (Hisamatsu, 1963)**

(Figs 68 and 69)

(= *Dirrhagus sahlbergi* (Mannerheim, 1823) *sensu* Hisamatsu, 1960: 98)  
*Dirrhagus olexai* Hisamatsu, 1963: 29

**Material examined.** One specimen was available for study: “LAOS-NE, Houa Phan prov., 20°12–13.5′N 103°59.5′–104°01′E, Ban Saluei → Phou Pane Mts., 1340–1870 m, 10.v.–16.vi.2009, M. Brancucci & local coll. leg.” / “NHMB Basel, NMPC Prague, Laos 2009 Expedition: M. Brancucci, M. Geiser, Z. Kraus, D. Hauck, V. Kubán” (NHMB).

**Redescription.** Length, 6.50 mm. Width, 1.50 mm. Body subcylindrical, elongate; uniformly reddish-brown; antennae reddish-brown; femur, tibiae and tarsi reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 44).

*Head:* Very closely punctate, subspherical; frons convex, with median triangular fovea; surface somewhat shiny; apical margin of frontoclypeal region feebly trilobed, less than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Serrate from antennomeres IV–X, reaching at least 1/2 the length of its body; setose; antennomere III slightly longer than IV; antennomeres IV–X each longer than wide, subequal, serrate; antennomere XI slightly longer than X.

*Pronotum:* Rugose; surface somewhat dull; slightly wider than long, with moderate, sharp hind angles; lateral sides parallel-sided; disc convex; base sinuous, with elongate carina above scutellum; anterior lateral pronotal ridge short, directed ventrally; posterior lateral pronotal ridge extends close to anterior margin of pronotum (Fig. 45).

*Scutellum:* Shiny, oblong, sub-triangular, distally rounded and apically furrowed.

*Elytra:* Slightly striate; interstices slightly elevated, surfaces closely punctate to rugose.

*Legs:* First tarsomere as long as the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves; metathoracic episternum slightly widened caudally; metathoracic coxal plates medially two times wider than laterally.

**Differential diagnosis.** Based on translated, interpreted information from FLEUTIAUX (1899, 1924, 1926, 1929, 1933 & 1938b) as well as HISAMATSU (1960 & 1963); diagnosis are based on the following: absence of median carina on frons and longer posterior lateral pronotal ridge will separate *R. olexai* from *Rhacopus yasumatsui* (Hisamatsu, 1960). Slightly caudally widened metathoracic episternum will further distinguish *R. olexai* from *Microrhagus rouani* (Fleutiaux, 1924) and *Microrhagus validus* (Fleutiaux, 1926). Incomplete posterior lateral pronotal ridge will also distinguish *R. olexai* from *Microrhagus coomani* (Fleutiaux, 1938), *Microrhagus dohertyi* (Fleutiaux, 1899), *Microrhagus indicus* (Fleutiaux, 1933) and *Microrhagus tonkinensis* (Fleutiaux, 1929).

**Distribution.** A very rare eucnemid species previously known from Japan. The species was taken for the first time in Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. A single adult was taken from a tropical montane deciduous forest.

### *Cafolus Bonvouloir, 1871*

(= *Arhagus* Fleutiaux, 1921: 72)

**Diagnosis.** Dirhagini, with apical margin of frontoclypeal region feebly trilobed and less than twice as wide as the distance between antennal sockets; hypomeron simple, without antennal grooves; pectinate or flabellate antennae; male prothoracic tarsomere I simple, without basal sex combs; metathoracic coxal plates laterally wider than medially; last visible ventrite either rounded or truncated; simple tarsal claws; lateral surfaces of mesothoracic and metathoracic tibiae with setae only; male aedeagus dorsoventrally compressed; without secondary lateral lobes; lateral lobes simple, longitudinally bilobed, apices directed mediad; median lobe simple, deeply and widely bifurcate apically; flagellum complex and tubular.

**Note.** Identification of the species was made through examination of the specimen against a description provided in FLEUTIAUX (1935).

### *Cafolus crassus* (Fleutiaux, 1935)

(Fig. 70)

*Arhagus crassus* Fleutiaux, 1935: 172

**Material examined.** One specimen was available for study: "LAOS, 1–18.v.2001, Bolikhamxai prov., 18°21'N 105°08'E, Ban Nape (8 km NE), ~600 m, Vít Kubáň leg." (NHMB).

**Redescription.** Length, 11.00 mm. Width, 3.50 mm. Body robust, elliptical; uniformly black; antennae black, except antennomere II dark brown; femur and tibiae black; tarsi dark reddish-brown; head, pronotum and elytra clothed with very short, white recumbent setae (Fig. 70).

*Head:* Very closely punctate; frons with median groove and fovea above frontoclypeal region; surface somewhat dull; apical margin of frontoclypeal region feebly trilobed, about 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Pectinate from antennomeres III–X, reaching about 1/3 the length of its body; rami elongate, arising from base of each antennomere; antennomere XI elongate.

*Pronotum:* Closely punctate to rugose; surface somewhat dull; about as long as wide, with moderate, sharp hind angles; lateral sides arcuate; disc with median groove; base sinuous, with enlarged, elongate, medially grooved carina above scutellum; anterior lateral pronotal ridge short, arcuate, directed ventrally; posterior lateral pronotal ridge elongate, extends near entire length of pronotum.

*Scutellum:* Shiny, oblong, sub-triangular and distally rounded; median carina slightly elevated.

*Elytra:* Striate; interstices elevated, surfaces closely punctate to rugose.

*Legs:* First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic

tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with basally toothed claws.

*Venter*: Punctate, with short, yellowish recumbent setae; hypomeron with anteriorly indicated notosternal antennal grooves; metathoracic episternum parallel-sided; metathoracic coxal plates laterally wider than medially.

**Differential diagnosis.** Larger size, unicolored black dorsum and robust form will distinguish *C. crassus* from most species in the group distributed in Southeast Asia.

**Distribution.** A very rare eucnemid species previously known from Thailand and Vietnam. The species was taken for the first time in Laos.

**Ecoregion(s).** Northern Annamites rain forests.

**Biology.** Developmental stages remain unknown. A single adult was taken from a lowland semi-evergreen forest.

### *Prodirhagus Fleutiaux, 1925*

(=*Collartinia* Cobos 1959: 47)

**Diagnosis.** Dirhagini, with apical margin of frontoclypeal region evenly rounded and less than twice as wide as the distance between antennal sockets; hypomeral antennal grooves present; serrate, pectinate or flabellate antennae; male prothoracic tarsomere I simple, with straight apical sex combs; metathoracic coxal plates medially either 1.20–2.50 or 3.00–6.00 times wider than laterally; last visible ventrite either rounded or acute; simple tarsal claws; lateral surfaces of mesothoracic and metathoracic tibiae with setae only; male aedeagus dorsoventrally compressed; without secondary lateral lobes; lateral lobes simple, longitudinally bilobed, apices directed mediad; median lobe simple, moderately and narrowly bifurcate apically; flagellum complex and tubular.

**Note.** Identification of the species were made through examination of the specimen against a description provided in BONVOULOIR (1872). New species determination was made by Jyrki Muona and verified against other species descriptions in the group.

#### Key to the species of *Prodirhagus*

- 1 Anterior lateral pronotal ridge directed ventrally; posterior lateral pronotal ridge complete. .... *Prodirhagus kresli* sp.nov.
- Anterior lateral pronotal ridge directed posteriorly; posterior lateral pronotal ridge shorter, near complete. ....  
..... *Prodirhagus subparallelus* (Bonvouloir, 1872)

#### *Prodirhagus kresli* sp.nov.

(Figs 71 and 72)

**Type material.** Male holotype: “LAOS, Vientiane pr., Lao Pako, 19.–21.5.2004, Petr Kresl leg.” / “65 km NE of Vientiane, alt. 200 m, near Nam Noum river” / *Prodirhagus* n. sp., J. Muona det. 2014” / “HOLOTYPE, *Prodirhagus, kresli*, Otto, det. R.L. Otto, 2014” (♂ handwritten behind species name on label) [red printed label]. Holotype is deposited in JMC.

**Description.** Male holotype: Length, 9.00 mm. Width, 2.50 mm. Body subcylindrical, elongate and tapering towards the elytral apex; uniformly dark reddish-brown; antennae

dark reddish; legs dark reddish; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 71).

*Head:* Closely, deeply punctate, subspherical; frons with very shallow median impression; surface dull; apical margin of frontoclypeal region evenly rounded, less than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Pectinate from antennomeres III–X, extending just beyond hind angles of pronotum; setose; antennomere II short, triangular; antennomere III with short lateral ramus; antennomeres III–X short between each rami; rami moderately elongate.

*Pronotum:* Closely, deeply punctate, almost rugose; surface dull; slightly longer than wide, with moderate, sharp hind angles; parallel-sided, slightly arcuate; disc convex, with pair of circular foveae and median groove extending from base to near apical end; base sinuous; anterior lateral pronotal ridge shorter, directed ventrally; posterior lateral pronotal ridge complete, extending to apical end (Fig. 72).

*Scutellum:* Shiny, punctate, sub-triangular and distally rounded.

*Elytra:* Striae present, especially at humeri; interstices elevated; rugose at basal half, closely punctate at apical half.

*Legs:* First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Densely punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves; metathoracic episternum caudally widened; metathoracic coxal plates 1.20–2.50 times wider than laterally.

**Etymology.** The specific epithet is named after Petr Kresl, collector of the new species.

**Differential diagnosis.** Anterior lateral pronotal ridge directed ventrally and entire posterior lateral pronotal ridge will distinguish *P. kresli* from *P. subparallelus*.

**Distribution.** A very rare, endemic eucnemid species known from a holotype collected within the Vientiane province in western Laos.

**Ecoregion(s).** Luang Prabang montaine rain forests.

**Biology.** Developmental stages remain unknown. A single adult was taken from a lowland semi-evergreen forest.

***Prodirhagus subparallelus* (Bonvouloir, 1872)**

(Figs 73 and 74)

*Microrhagus subparallelus* Bonvouloir, 1872: 594–595; plate 29, Fig. 2

**Material examined.** One specimen was available for study: “LAOS, Phongsaly prov., BAN SANO MAI, 19.–26.v.2004, ~1500 m, 21°21′N 102°03′E, P. Pacholátko leg.” (NHMB).

**Redescription.** Length, 5.25–5.50 mm. Width, 1.50 mm. Body subcylindrical, elongate and tapering towards the elytral apex; uniformly dark reddish-brown; antennae dark reddish-brown; legs medium reddish-brown; head, pronotum and elytra clothed with short, yellowish recumbent setae (Fig. 73).

*Head:* Very closely punctate, subspherical; frons with very short, median ridge; surface somewhat shiny; apical margin of frontoclypeal region evenly rounded, less than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Female antennae serrate from antennomeres III–X, reaching almost 1/2 the length of its body; antennomere III longer than IV; antennomere IV longer than II; antennomeres IV–X subequal, longer than wide; antennomere XI longer than X. Male antennae pectinate from antennomeres VI–X, reaching about 1/2 the length of its body; antennomeres IV and V serrate; rami elongate, arising from apices of antennomeres VI–X; antennomere XI elongate.

*Pronotum:* Deeply and closely punctate to rugose; surface dull; longer than wide, with moderate, sharp hind angles; parallel-sided, apically arcuate; disc with pair of shallow, circular foveae and deep median groove; anterior lateral pronotal ridge short, directed posteriorly; posterior lateral pronotal ridge elongate, extends near entire length of pronotum; base sinuous (Fig. 74).

*Scutellum:* Shiny, oblong, sub-triangular and distally rounded.

*Elytra:* Striae feebly indicated; interstices elevated; surfaces closely transversely rugose.

*Legs:* First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate, with short, yellowish recumbent setae; hypomeron with notosternal antennal grooves; metathoracic episternum caudally widened; metathoracic coxal plates medially 1.20–2.50 time wider than laterally.

**Differential diagnosis.** Anterior lateral pronotal ridge directed posteriorly and shorter posterior lateral pronotal ridge will distinguish *P. subparallelus* from *P. kresli*.

**Distribution.** A very rare eucnemid species previously known from Papua New Guinea. The species was taken for the first time in Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. A single adult was taken from a tropical montane deciduous forest.

### *Sarpedon* Bonvouloir, 1871

**Diagnosis.** Dirhagini, with apical margin of frontoclypeal region trilobed and more than twice as wide as the distance between antennal sockets; antennae either bipectinate or biserrate; hypomeron simple, without antennal grooves; male prothoracic tarsomere I simple, without sex combs; metathoracic coxal plates parallel-sided; last visible ventrite either acute, rounded or truncated; hypomeral pits absent; lateral pronotal ridges complete; lateral surfaces of mesothoracic and metathoracic tibiae with setae only; male aedeagus dorsoventrally compressed; lateral lobes longitudinally bilobed, with apices directed mediad; median lobe simple, deeply and widely bifurcate apically; flagellum complex and tubular.

**Note.** Identification of *Sarpedon bipectinatus* was made possible through a paper I received from my colleague, Wataru Suzuki. The illustration in the paper provided the means to identify the species. The determination of *Sarpedon apicalis* as a new species was facilitated through a personal correspondence with Wataru Suzuki to understand diagnostic feature of the Japanese *Sarpedon atratus* Fleutiaux, 1922 and compare information he provided against the specimen. The specimen failed to match well with any features Suzuki provided and concluded the determination of the new species.

### Key to the species of *Sarpedon*

- 1 Size smaller, less than 7.00 mm long; elytra black. ....  
 ..... *Sarpedon apicalis* sp.nov.  
 – Size large, greater than 7.00 mm long; elytra infusate reddish. ....  
 ..... *Sarpedon bipectinatus* Fleutiaux, 1896

### *Sarpedon apicalis* sp.nov.

(Fig. 75)

**Type material.** Male holotype: “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), N20°12' E104°01', 1300–1900 m, 11.iv.–15.v.2012” / “BMNH{E}, 2012-14, C. Holzschuh” / “HOLOTYPE, *Sarpedon, apicalis*, Otto, det. R.L. Otto, 2014” (♂ handwritten behind species name on label) [red printed label]. Holotype is deposited in BMNH.

**Description.** Male holotype: Length, 5.00 mm. Width, 1.50 mm. Body subcylindrical, elongate and tapering towards the elytral apex; uniformly dull black, except apical margin of pronotum reddish-brown; antennae black; femur and tibiae infusate dark reddish-black, tarsi reddish-brown; head, pronotum and elytra clothed with short, sparse, yellowish recumbent setae (Fig. 75).

*Head:* Rugose, almost granulose, subspherical; frons with very shallow median groove; surface dull; apical margin of frontoclypeal region trilobed, more than 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Bipectinate from antennomeres III–X, extending just beyond hind angles of pronotum; setose; antennomere II short, triangular; antennomere III with short lateral ramus; antennomeres III–X elongate between each rami; antennomere XI missing.

*Pronotum:* Rugose, almost granulose; surface dull; about as long as wide, with moderate, sharp hind angles; parallel-sided, slightly arcuate; disc convex, with median groove extending from base to near apical end, each lateral side with short, vertical groove; base sinuous; lateral pronotal ridge complete.

*Scutellum:* Shiny, wide, sub-triangular and distally rounded.

*Elytra:* With indications of striae; interstices elevated with rugose punctations.

*Legs:* First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Deeply punctate to rugose, with short, yellowish recumbent setae; hypomeron without notosternal antennal grooves; hypomeral pits absent; metathoracic episternum caudally widened; metathoracic coxal plates parallel-sided.

**Etymology.** The specific epithet is derived from its reddish-brown apical margin of the pronotum.

**Differential diagnosis.** Smaller size, black elytra and reddish-brown apical margin of pronotum will distinguish *S. apicalis* from *S. bipectinatus*. *Sarpedon apicalis* is very similar to the Japanese *Sarpedon atratus* Fleutiaux, 1896, but differs by the presence of vertical grooves on the lateral sides of the pronotum and lack of basal grooves or impressions on the pronotal base.

**Distribution.** A very rare, endemic eucnemid species known from a holotype collected in the Houaphanh province of Northeastern Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. A single adult was taken from a tropical montane deciduous forest.

### *Sarpedon bipectinatus* Fleutiaux, 1896

(Fig. 76)

**Material examined.** One specimen was available for study: “NE LAOS, Hua Phan prov., Ban Saleui, Phou Pan (Mt.), N20°12' E104°01', 1300–1900 m, 11.iv.–15.v.2012” / “BMNH{E}, 2012-14, C. Holzschuh” (BMNH).

**Redescription.** Length, 10.75 mm. Width, 3.00 mm. Body subcylindrical, elongate and tapering towards the elytral apex; uniformly black, except elytra dark infusate red; antennae black; legs black; tarsi black, except tarsomeres IV and V infusate reddish-black; head, pronotum and elytra clothed with very short, yellowish recumbent setae (Fig. 76).

*Head:* Very deeply punctate, subspherical; frons with tear drop-shaped median groove; surface shiny; frontoclypeal region with very fine median carina; apical margin of frontoclypeal region trilobed, about 2.00 times wider than base; mandibles stout, bidentate, densely punctate and rugose.

*Antennae:* Bipectinate from antennomeres III–X, extending just beyond hind angles of pronotum; setose; antennomere II short, globular; antennomere III with short lateral and medial rami; antennomeres III–X short between each rami; antennomere XI bilobed.

*Pronotum:* Rugose to granulose; surface shiny; as long as wide, with moderate, sharp hind angles; parallel-sided, apically arcuate; disc with pair of shallow, circular foveae near base and median groove extending from base to near apical end; lateral pronotal ridge complete; base sinuous.

*Scutellum:* Shiny, oblong, sub-triangular and distally rounded.

*Elytra:* Striae indicated; interstices elevated, keeled; surfaces rugose.

*Legs:* First tarsomere shorter than the combined lengths of the remaining four on mesothoracic and metathoracic tarsi; tibiae rounded in cross section; metathoracic tarsomeres I–III simple; metathoracic tarsomere IV excavate-emarginate; metathoracic tarsomere V elongate with simple claws.

*Venter:* Punctate to rugose, with short, yellowish recumbent setae; hypomeron without notosternal antennal grooves; metathoracic episternum caudally widened; metathoracic coxal plates parallel-sided.

**Differential diagnosis.** Larger size, infusate reddish elytra and entirely black colored pronotum will distinguish *S. bipectinatus* from *S. apicalis*.

**Distribution.** A very rare eucnemid species previously known from Papua New Guinea, Taiwan and Vietnam (FLEUTIAUX 1947, SUZUKI & CHOU 2012)). The species was taken for the first time in Laos.

**Ecoregion(s).** Northern Indochina subtropical forests.

**Biology.** Developmental stages remain unknown. A single adult was taken from a tropical montane deciduous forest.

### SUBFAMILY EUCNEMINAE ESCHSCHOLTZ, 1829

**Diagnosis.** Mandibles slender, without teeth, originally with ventrally expanded lateral surfaces; antennomeres IX–XI originally enlarged, tubular, sexually dimorphic; prothoracic tibiae with one apical spur; lateral surfaces of mesothoracic and metathoracic tibiae flattened with sharp angles between lateral and caudal surfaces, originally with hairs and spines; male prothoracic tarsomere I with or without sex combs; tarsomere IV originally simple; prohypomeron with basally closed lateral antennal grooves; male aedeagus flattened; median lobe free, without dorsal basal struts, originally with notched apex; female eighth sternite partly sclerotized; bursa originally bifurcate, undivided; spermatheca sclerotized, divided.

#### Key to the tribes within the subfamily Eucneminae

- |   |  |                                      |
|---|--|--------------------------------------|
| 1 | Prothoracic tibiae with one apical spur. ....  | 2                                    |
| – | Prothoracic tibiae without apical spur. ....   |                                      |
|   | .....  | <b>Dendrocharini Fleutiaux, 1920</b> |
| 2 | Tarsi simple, without ventral lobes. ....  | 3                                    |
| – | Tarsi with ventral lobes. ....   | <b>Galbitini Muona, 1991</b>         |
| 3 | Cylindrical form; hypomeron usually without excretory hairs along antennal grooves. .... | <b>Mesogenini Muona, 1993</b>        |
| – | Elongated form; hypomeron with excretory hairs along antennal grooves. ....              | <b>Eucnemini Eschscholtz, 1829</b>   |

#### Tribe Dendrocharini Fleutiaux, 1920

**Diagnosis.** Form massive, cylindrical; eyes small; mandible short, with secondary ventral tooth; frontoclypeal region short, very wide; antennal sockets widely separated; apical spur absent on prothoracic tibiae; tarsomere IV simple; antennomeres III–XI flattened, triangular; metathoracic sternum without tarsal grooves; aedeagus flattened, highly modified, tubular; basal piece very small, dorsally closed; median lobe with entire apex; lateral lobes transversely divided dorsally; bursa simple, divided; spermatheca sclerotized, divided.