

## A review of the genus *Lemodes* Boheman, 1858 (Coleoptera: Anthicidae: Lemodinae)

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### Abstract

The genus *Lemodes* Boheman, 1858 is distributed in Australia, New Guinea and on the Solomon Islands. A list of known species of the group, descriptions of five new species, namely *Lemodes bicolora* sp. nov., *L. buratea* sp. nov., *L. iriana* sp. nov., *L. lauta* sp. nov. (all from New Guinea), *L. isatabua* sp. nov. (from Solomon Islands) and also an original identification key to *Lemodes* are presented.

### Zusammenfassung

Die Gattung *Lemodes* Boheman, 1858 kommt in Australien, Neu Guinea und auf den Salomonen vor. Es wird eine Liste der bekannten Arten dieser Gattung präsentiert, sowie fünf Arten für die Wissenschaft neu beschrieben: *Lemodes bicolora* sp. nov., *L. buratea* sp. nov., *L. iriana* sp. nov., *L. lauta* sp. nov. (alle aus Neu Guinea), *L. isatabua* sp. nov. (von den Salomonen). Weiterhin wird ein neuer Bestimmungsschlüssel der *Lemodes*-Arten präsentiert.

**Key words:** Coleoptera, Anthicidae, Lemodinae, *Lemodes*, New Guinea, Solomon Islands, Australia, review, new species, key

### Introduction

Anthicids of the genus *Lemodes* Boheman, 1858 are among the most beautiful representatives of this family. Most of the species of this group distributed in eastern states of Australia on New Guinea and on Solomon Islands were originally placed in *Lemodes*, but two species were described in *Lagriomorpha* Champion, 1916. No species analysis, key or recent species list previously exist for *Lemodes*. Five new species are described in the current paper, an original key to species is presented and also a species list and bibliographical review are prepared.

### Legends

All species are listed alphabetically. All label text is reproduced exactly, with no corrections or additions; labels

(if more than one for the same specimen) are separated by slashes (/). Author's comments are placed in square brackets [ ].

### Acronyms for the type material stores:

BMNH	The Natural History Museum (British Museum, Natural History), London (UK);
HMNH	Hungarian Museum of Natural History, Budapest (Hungary);
IRSN	Institut Royal des Sciences naturelles, Bruxelles (Belgium);
NME	Naturkundemuseum Erfurt (Germany);
OUNH	Oxford University Museum of Natural History (UK);
SMNS	Staatliches Museum für Naturkunde, Stuttgart (Germany);
ZMUC	Zoological Museum University of Copenhagen (Denmark);
CAW	Collection Andreas Weigel, Wernburg (Germany);
CDT	Collection Dmitry Telnov, Rīga (Latvia).

### Historical review

The genus *Lemodes* was originally established by BOHEMAN (1858) for a single species from New South Wales, Australia. The generic name *Lemodes* according to BOHEMAN's description is derived from *Lema* Fabricius, 1798 (Chrysomelidae: Criocerinae), in sense "like *Lema*", from the Greek; the gender of *Lemodes* is feminine. The generic characters mentioned in the original description were mainly shape and structure of pronotum and elytra, kind of dorsal pubescence of the body, and also form of antennae and maxillary palps. After that, 5 further species from eastern states of Australia and Island of New Guinea were described by diverse authors – Blair, Lea, MacLeay, and Oberthür (see chapter "Species List of *Lemodes* Boheman, 1858"). OBERTHÜR (1884) proposed a new synonymy: *Lemodes coccinea* Boheman, 1858 = *L. mastersi* MacLeay, 1872, but further authors (LEA 1906; BLAIR 1928) disagreed with him. The type of *L. mastersi* MacLeay was not available for current study. It is probable that OBERTHÜR did not study the type specimen of *L. mastersi* (he used a citation from MACLEAY's original description of that species) and actually compared two color races of *L. coccinea* and not *L. coccinea* and *L. mastersi* (*L. coccinea* is quite aberrant in coloration of the body: from completely red or reddish orange to forebody black with red elytra; underside can be completely red or with red abdomen and metasternum with black pro- and meso-

thorax and black coxae; antennomeres 1-3 can be completely black or red, and also antennomeres 9-11, 10-11 or 11 (at minimum) are white). LEA (1896) described one other Australian species, *Lemodes corticalis*, which was placed as a junior synonym of *Trichananca victoriensis* Blackburn, 1891 by BLACKBURN (1899: 83). CHAMPION (1916) established the new genus *Lagriomorpha* for a single species from satellite islands of New Guinea. After that, YOUNG (1978) followed with the second species of that genus. *Lagriomorpha* was synonymised with *Lemodes* by TELNOV (2004), followed by description of one more species of *Lemodes*. Taxonomically, *Lemodes* was included in Pyrochroidae by early authors. BLAIR (1913) noticed important affinities of *Lemodes* to Anthicidae, but in a later publication (1928, JUNK's "Coleopterorum catalogus") the genus still remained in Pyrochroidae. Together with some related taxa, *Lemodes* was first placed in Anthicidae by BRITTON (1970), followed by LAWRENCE & BRITTON (1994). CHAMPION (1916) also originally placed the genus *Lagriomorpha* in Pyrochroidae, and only YOUNG (1978) transferred this genus to Anthicidae. Consequently, the genus *Lemodes* is a small group of lemodine Anthicidae with 15 known recent species (including five described below) distributed in eastern Australia, on New Guinea and its small satellite islands. The group still remains in need of a major revision.

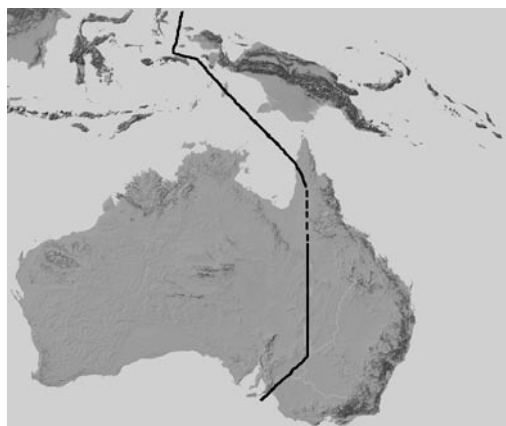


Figure 1. Geographical range of the genus *Lemodes* Boheman (map generated using ArcGIS 9.2), east from the line.

## Genus *Lemodes* Boheman, 1858

Type species: *Lemodes coccinea* Boheman, 1858 [monotypy] = *Lagriomorpha* Champion, 1916

Type species: *Lagriomorpha semicaerulea* Champion, 1916 [original designation]

Total body length 4.50 to 10.0 mm. Ratio of body length to greatest body width 2.23-3.81. Body dorsally slightly flattened to moderately convex. Upper surfaces of body clothed with distinct hairs and setae or scale-like hairs. Head width behind eyes not distinctly greater than prothoracic width. Head abruptly constricted posteriorly to form neck. Tempora shorter than length of eye. Eyes entire, strongly protuberant. Posterior edge of eye not or vaguely emarginate. Antennal insertions widely separated. Frontoclypeal suture (when applicable) straight or slightly curved, indistinctly or distinctly impressed. Antennae long and stout, with distinctly and densely pubescent antennomeres. Number of antennomeres 11-12. Mandible short and broad with apex moderately to strongly, gradually curved mesally. Terminal maxillary palpomere axeform. Pronotum with maximum width anteriorly. Base of pronotum distinctly narrower than elytral bases. Anterior edge of pronotum simple, without margin. Basal edge of pronotum simple, not or vaguely margined. Disc of pronotum without median longitudinal groove or with such groove. Procoxal cavity mainly circular, rarely longer than wide. Procoxal cavities contiguous at middle. Procoxal cavities externally broadly open, internally broadly closed. Elytra irregularly punctuate or with confused rows of punctures along suture. Sutural striae completely or partly developed, not deeply impressed near apex. Apex of pygidium exposed by elytra. Elytral apices meeting or almost meeting at the suture. Epipleura incomplete. Mesocoxal cavities circular to slightly transverse, not or slightly oblique. Mesocoxae separated by much less than minimum diameter of coxal cavity. Mesepimera not visible from above. Mesocoxal cavities open laterally, not closed by metepisterna. Mesoventral process extending to middle or more of mesocoxal cavities. Metacoxae horizontally oriented, widely separated by less than maximum metacoxal diameter. Hind wings well developed (compare YOUNG 1978). Legs stout. All tibial spurs double, subequal in length and form. Tibiae with or without distinct keels. Penultimate tarsomeres distinctly bilobate. Abdomen with five abdomi-

nal ventrites separated by distinct sutures. First ventrite not distinctly longer than second one. Anterior edge of sternite 9 in male with median strut (spiculum gastrale). Tergite 9 in male completely fused to tergite 10. Aedeagus tenebrionoid, symmetrical. Parameres partly or entirely fused together and to phallobase. Mesothorax: Mesepisternal margins straight and meet in front of mesosternum in the middle of the frontal margin of mesothorax (Fig. 3). The orifice of mesothoracic gland is situated into frontal margin of mesosternum. Mesothoracic glands relatively small, 0.39-0.42 mm.

**Distribution.** The extent of the genus does not exceed Lydekker's line to the west and is only distributed in Australian region (Fig. 1). 6 species of *Lemodes* are known from eastern states of Australia (New South Wales, Australian Capital Territory, Queensland, Victoria), 8 species of New Guinea including a few of its satellite islands, and 1 is known from Solomon Islands (Guadalcanal).

**Ecology and biology.** Species of *Lemodes* occurs in semidry forests (Fig. 2), and also in typically tropical and subtropical rainforest habitats, of them Australian and Solomon species in lowland, but New Guinean

species mainly in mountain forests. Adult *Lemodes* are commonly collected on surfaces of rotten logs and larvae are associated with fungal growths on wood surfaces. Specimens are often taken by flight intercept traps (Fig. 2). On New Guinea some specimens have been collected by sifting litter and rotten wood.



Figure 2. Habitat of *Lemodes coccinea* Boheman: Australia, New South Wales, New England National Park SE env., Falls Road, old growth dry sclerophyll area, flight intercept traps (photo by D.S. Chandler).

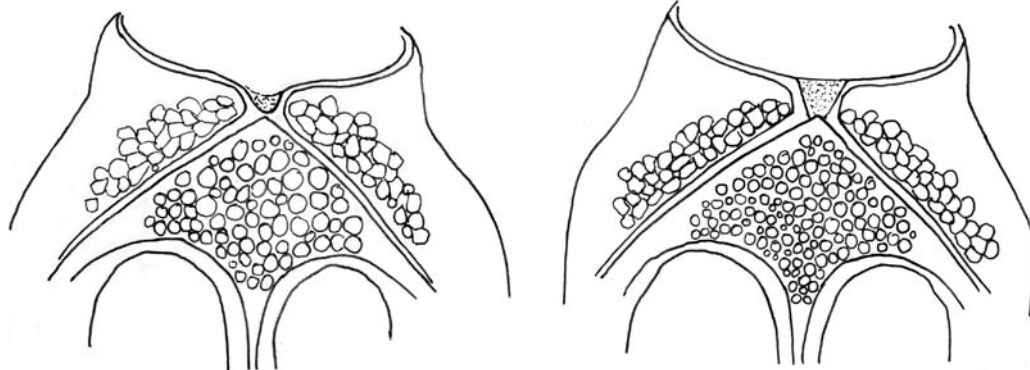


Figure 3. Schematic views of mesothorax on *Lemodes* Boheman (from TELNOV 2004).

## Descriptions of new species

### *Lemodes bicolora* sp. nov. (Figs. 4-7)

Holotypus ♀, NME. W-PAPUA Manokwari Pr. vic. Mokwam (Siyoubrig) 1400-1800m, 01°06.26'S, 135°54.41'E, 24.-28.II.2007 leg. A. Weigel UWP/UWS [printed].

Derivatio nominis. Because of the coloration of dorsal surface, this species is named as two-colored, from Latin „bi” and „color”.

Measurements of the holotype: total body length 8.39 mm, maximum width in apical third of elytra 2.51 mm; head 1.21 mm long, through eyes 1.43 mm broad, pronotum 1.50 mm long, maximum width 1.47 mm, elytra 5.65 mm long, 2.51 mm together broad.

Coloration. Head, pronotum, scutellum, palps, legs and entire underside except abdomen red. Elytra red in basal half, dark metallic green in apical half. Abdomen com-

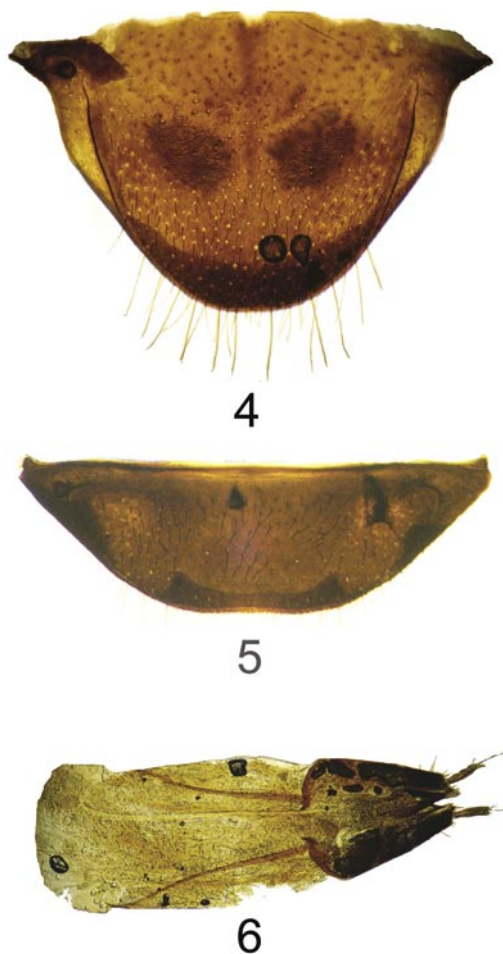
pletely black. Antennomeres 1-3 reddish orange (third antennomere narrowly black on terminal margin), 4-8 black, 9-11 orange (covered with dense whitish setae and looks like orange-white).

Head slightly shiny, triangular, with medium, strongly prominent, circular and finely faceted eyes. Tempora very short, nearly absent, less than 1/5 of length of eye. Head base nearly straight. With broad and shallow impression on place of frontoclypeal suture. Dorsal surface confusedly very densely and flat punctured. Intervals much smaller than punctures. Punctures vary in size greatly – some punctures are very large, another ones – very small. Ventral surface with punctures more sparse and less coarse. Pubescence long, appressed, reddish. Antennae massive, long, almost reaching the middle of elytra. All antennomeres covered with stout, dense semi- and erect setae. Setae are reddish on red antennomeres 1-3, black on antennomeres 4-8 and whitish on antennomeres 9-11. Basal antennomere thickened, nearly oval. Second antennomere shortened, and third antennomere on one sixth longer than previous. Antennomeres 4-10 slightly thickened distally, antennomere 10 slightly shortened. Terminal antennomere on one third longer than previous. Terminal maxillary palpomere indistinctly securiform. Pronotum slightly shiny, frontal and basal margins nearly straight, laterally widened before the middle and with flat constriction before the base. Puncture of regular circular form, dense, slightly crateriform, with intervals smaller or equal to size of punctures. Pubescence reddish, as on the head. On sides and on disk with several longer erect setae. Sides of pronotum distinctly but much more scarce punctured. Scutellum suboval, not shiny, densely setose. Elytra slightly shiny in basal and distinctly – in apical half. Elongate and nearly subparallel in basal half, elytra becoming wider behind the middle. Post-basal transverse impression not indicated. Punctures irregularly, large and dense in basal half, with intervals smaller or equal in size as punctures. Toward apex, punctures becoming smaller and more flat, intervals are mainly as large to twice as large as size of punctures. Main pubescence dense, appressed, directed more or less constantly posteriorly, reddish on red half of elytra and black on green half. Whole surface also densely covered with semierect long setae directed posteriorly, grayish in color. Sutural striae not narrow, distinctly developed in apical third. Hind wings fully developed.

Legs long, covered with yellowish semierect setae. Penultimate tarsomeres distinctly bilobate. Distal tarsomeres large, tarsal claws long, simple. Tibial spurs short, stout. All tibiae with indistinct keels along outer and inner surface, not reaching over middle of tibial length. Pygidium on one third exposed. Pygidium of female half circular, rounded apically (Fig. 4). Visible sternite V of female broad, narrow, flattened apically (Fig. 5). Ovipositor (Fig. 6).

Dimorphism. Male is unknown. Female see Fig. 7.

Diagnosis. By the color pattern of the body, this new species strongly resembles *Lemodes semicoerulea*



Figures 4-6. *Lemodes bicolora* sp. nov.: 4 – pygidium, dorsal (holotypus ♀); 5 – sternite V (holotypus ♀); 6 – ovipositor (holotypus ♀).

(Champion) (New Guinea & surrounding islands). By *L. semicoerulea*, elytra are not widened in apical half which is dark blue to violet colored (dark green in *L. bicolora* sp. nov.), have three terminal antennomeres black, stronger and more sparse punctured elytra and strongly securiform terminal maxillary palpomere.

***Lemodes buratea* sp. nov.** (Figs. 8-15)

Holotypus ♂, NME. INDONESIA or. Irian Jaya, 170km S of Nabire Epomani 1150m 06.I.1996 leg. A.Weigel / Lagriomorpha semicaerulea Champ. det. G.Uhmann [both labels printed].

Paratypes: 2 specimens, same labels as in the holotype [1 ♀ CAW, 1 ♂ CDT].

Derivatio nominis. This species is named after Burate, one of the native languages of indigenous tribes of the Nabire region of Irian Jaya, where the new species was collected. Actually, about only 100 people speak Burate (report data 1987, <http://www.ethnologue.com>).

Measurements of the holotype: total body length 5.27 mm, maximum width in the middle of elytra 1.38 mm; head 0.84 mm long, through eyes 0.97 mm broad, pronotum 1.20 mm long, maximum width 0.96 mm, elytra 3.23 mm long, 1.38 mm together broad.

Coloration. Head reddish orange, pronotum and scutellum dark red. Elytra violet to dark blue. Maxillary palps dark brown. Antennomeres 1-3 reddish orange, 4-10 black, terminal antennomere light orange. Legs brown, front items more reddish, meso- and metatibiae almost black. Underside of head, and also pro- and mesothorax red, metathorax and abdomen black. Before the middle of each elytron with one vague transverse band of white hairs which is broadly interrupted on suture.

Head shiny, triangular, with small, prominent, elongate (narrow) and finely faceted eyes. Tempora short, abruptly angulate, nearly as long as length of eye. Head base nearly straight. Frontoclypeal suture not present. Dorsal surface confusedly finely and very sparsely punctured. Punctures of variable size and intervals also variable - smaller, equal or larger than punctures. Tempora laterally very densely, coarsely punctured. Ventral surface with punctures more sparse and less coarse. Pubescence short, semierect, brownish. Antennae massive, long, but not reaching the middle of elytral

length. Antennomeres 3-11 covered with stout, dense semi- and erect setae, whose are reddish on antennomeres 1-4, black on antennomeres 5-10 and white on terminal antennomere. Basal antennomere thickened, nearly circular. Second antennomere short, and third antennomere on one third more long than previous. Antennomeres 5-10 distinctly thickened distally. Terminal maxillary palpomere short, moderately securiform. Pronotum shiny, frontal and basal margins nearly straight, laterally widened before the middle and with flat constriction before the base. On disk, with very flat longitudinal carina beginning in anterior third and reaching the base. Punctuation similar to that on head, both punctures and intervals large. Pubescence brownish, as on the head. Laterally are sides of pronotum more sparse punctured. Scutellum subcircular, slightly shiny, finely punctate and sparsely setose. Elytra distinctly shiny, elongate and subparallel. Postbasal transverse impression very vague indicated. Punctures large and dense in basal half, with intervals smaller than punctures. Toward apex, punctures become much smaller. One irregular row of punctures along suture. Sutural striae narrow, developed from the middle toward the apex. Pubescence black, suberect, directed posteriorly. Transverse band of obliquely directed, appressed white hairs directly before the middle. Hind wings fully developed. Legs stout, covered with whitish semierect setae. Penultimate tarsomeres distinctly bilobate. Distal tarsomere large, tarsal claws long, simple. Tibial spurs very short, stout. All tibiae with distinct complete keels along outer and inner surface. Meso- and metatibiae stout, short, slightly curved. Pygidium of male is partly exposed. Pygidium of male broadly triangular, abruptly angulate apically (Fig. 9). Visible sternite V of male broadly excavated on apically (Fig. 10). Aedeagus (Fig. 11). Spiculum gastrale (Fig. 12).

Variability. In both paratypes, the pronotum is dark red with indistinct metallic violet reflection. In female paratype, also fourth antennomere is distinctly reddish and scutellum – black.

Dimorphism. Female larger and slightly more robust, 5.60 mm in length. In females, pygidium is slender and narrowly angulate on apex (Fig. 13), visible sternite V is apically truncate and with only vague indicated excavation (Fig. 14). Ovipositor (Fig. 15).

Diagnosis. Due to coloration and structure of dorsal surface this species is related with *Lemodes lauta* sp.

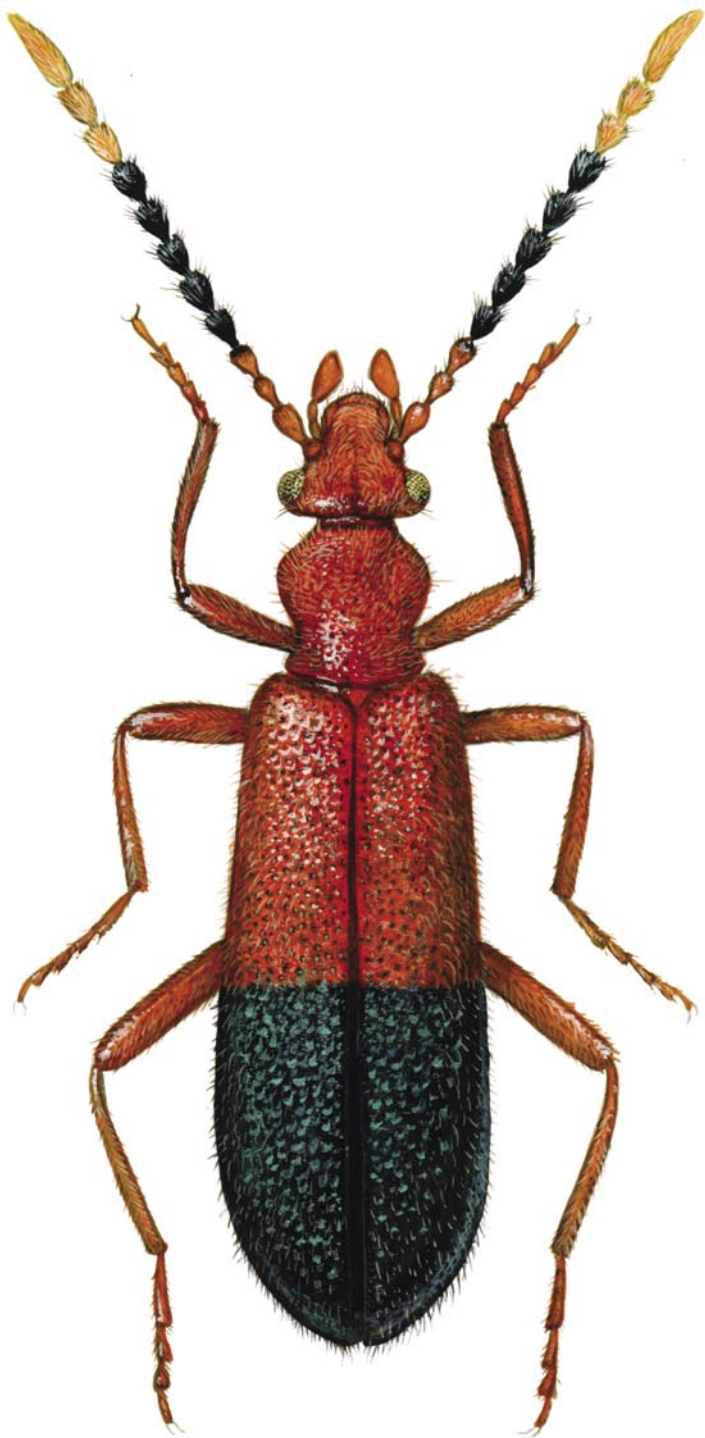


Figure 7: *Lemodes bicolora* sp. nov., habitus holotype (♀)



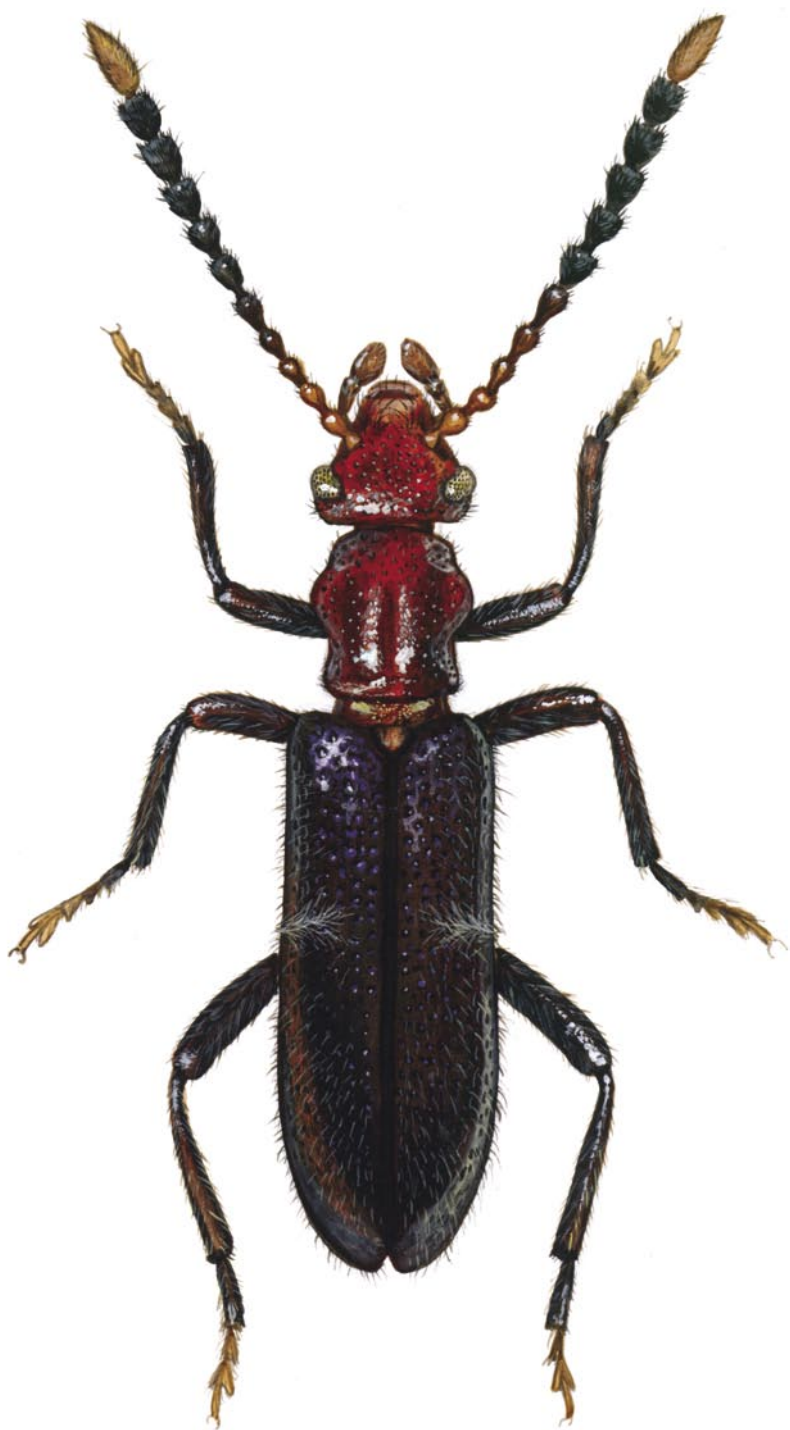
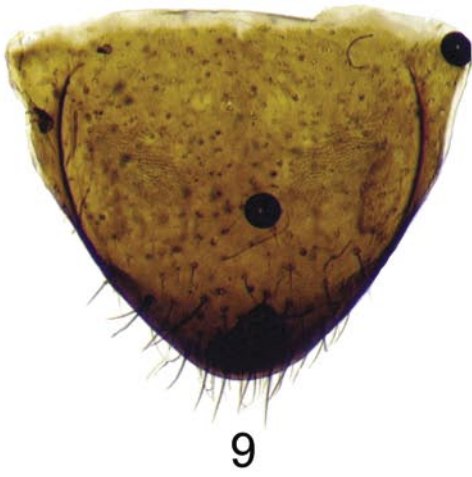
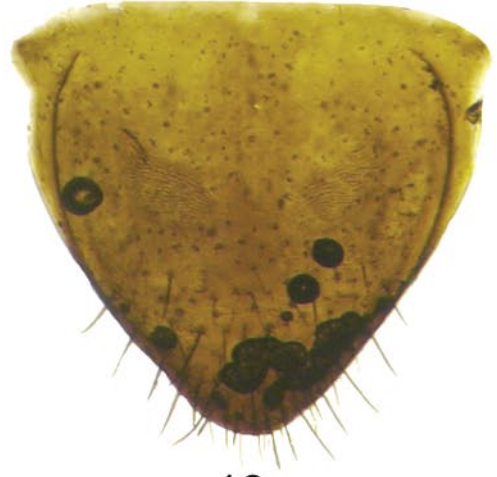


Figure 8: *Lemodes buratea* sp. nov., habitus, holotype (♂)



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12



15

Figures 9-15. *Lemodes buratea* sp. nov.: 9 – pygidium, dorsal (holotypus ♂); 10 – sternite V (holotypus ♂); 11 – aedeagus (holotypus ♂); 12 – spiculum gastrale (holotypus ♂); 13 – pygidium, dorsal (paratypus ♀); 14 – sternite V (paratypus ♀), 15 – ovipositor (paratypus ♀).



nov., from which it differs mainly in having coarsely punctured forebody, having only single transverse band of white hairs on elytra and by structure of last visible ventrites and aedeagus.

***Lemodes iriana* sp. nov.** (Figs. 16-19)

Holotypus ♂, SMNS. Irian Jaya: Jayawijaya, Emdoman 1200-800m 14.-15.9.1992 leg. A. RIEDEL [printed, label violet] / Anthicidae (Pedilinae) [handwritten] det. O. Merkl, [printed] 1994 [handwritten].

Derivatio nominis. Species is named after "Irian" - a Papuan word meaning "hot land rising from the sea", which is one of two words combining Irian Jaya - a former name for the Indonesian part of New Guinea, the type area of the new species.

Measurements of the holotype: total body length 5.37 mm, maximum width in the middle of elytra 1.48 mm; head 0.90 mm long, through eyes 1.10 mm broad, pronotum 1.13 mm long, maximum width 0.98 mm, elytra 3.31 mm long.

Coloration. Uniformly black, head and pronotum dorsally with distinct metallic violet shine, elytra with pronounced metallic blue shine in basal half which changes to violet shine behind the middle. Clypeus, labrum, mouth parts and maxillary palps brown to dark brown. Scutellum and very narrow zone on the base of elytra black without metallic shine. Antennomeres 1-2 dark reddish brown, 3-10 black, terminal antennomere light orange. The base of the first antennomere is reddish orange. Legs brown to black, base of all femora slightly lighter. Middle of each elytron with one well developed transverse band of oblique white hairs, which is broadly interrupted on suture.

Head is shiny, triangular, with small, prominent, oval and finely faceted eyes. Head abruptly rounded behind eyes, tempora short. Front-clypeal suture vague indicated, flat. Dorsal surface confusedly, sparsely, and flat punctured. Punctures of variable size - larger on frons and smaller toward the base. Intervals vary in size - smaller to twice so large than punctures. Tempora laterally finely and more densely punctured. Ventral surface with punctures more sparse and less coarse. Pubescence short, semierect, brownish. Antennae massive, long, reaching the middle of elytral length. All antennomeres

covered with stout, dense semi- and erect black setae and with slightly longer and appressed whitish setae. Basal antennomere thickened, oval. Second antennomere shortened, and third antennomere on one fourth more long than previous. Antennomeres 5-10 distinctly thickened distally, antennomere 10 also distinctly shortened. Terminal maxillary palpomere short, strongly securiform. Pronotum shiny, dorsally distinctly convex. Frontal and basal margins nearly straight, laterally widened before the middle and with distinct constriction before the base. Punctuation sparse and confused, intervals mostly larger than punctures or equal to puncture size (near the base). Pubescence brownish, semierect, curved, sparse. Base of pronotum with a ring of longer whitish hairs directed anteriorly. Laterally unpunctured and shiny except for transverse impression which is covered by large and dense punctures and sparse but distinct long whitish pubescence. Scutellum oval, not shiny, densely setose. Setae are black except for apex of scutellum which is distinctly white. Elytra distinctly shiny, elongate and subparallel. Postbasal transverse impression very vague indicated. Punctures large and dense in basal half, with intervals much smaller than punctures. After the middle, punctures becoming much smaller and very flat (especially in apical third). Sutural striae narrow, developed from the postbasal transverse impression toward the apex. Pubescence black, long, semierect, directed posteriorly. Transverse band of obliquely directed, appressed, dense white hairs in the middle. Hind wings fully developed. Legs stout, covered with whitish semierect setae. Penultimate tarsomeres distinctly bilobate. Distal tarsomeres large, tarsal claws long, simple. Tibial spurs very short, stout. Meso- and metatibiae with flat keels along inner surface, on two thirds of tibial length. Pygidium completely covered by elytra. Pygidium of male broadly rounded apically (Fig. 17). Visible sternite V of male very broadly rounded on apically (Fig. 18). Aedeagus (Fig. 19).

Dimorphism. Female unknown.

Diagnosis. Externally extremely similar and possibly closely related to *Lemodes nigrocaerulea* Telnov (Papua New Guinea). From that it differs mainly in having the metasternum not unusually globose, elytra subparallel through their entire length, transverse hair band broadly interrupted on suture. *L. iriana* have the base of pronotum with a ring of sparse, long, white pubescence and the extreme base of the basal antennomere



Figure 16: *Lemodes iriana* sp. nov., habitus, holotype (♂)

is reddish orange. Sternite V is not excavated on apical margin in male.



Figures 17-19. *Lemodes iriana* sp. nov.: 17 – pygidium, dorsal (holotypus ♂); 18 – sternite V (holotypus ♂); 19 – aedeagus (holotypus ♂).

***Lemodes isatabua* sp. nov.** (Figs. 20-24).

Holotypus ♂, BMNH. 4075 [handwritten] / SOLOMON IS. *Guadalcanal Popanu 15.xii.1934 R.A.Lever 500'* [partly regular & printed, partly italic & handwritten].

Derivatio nominis. The name for this new species derives from Isatabu, a local name for Guadalcanal island of the Solomons, where the new species was collected.

Measurements of the holotype: total body length 6.79 mm, maximum width behind the middle of elytra 2.16 mm; head 0.94 mm long, through eyes 1.25 mm broad,

pronotum 1.35 mm long, maximum width 1.27 mm, elytra 4.48 mm long, 2.16 mm together broad.

Coloration. Head, pronotum, scutellum, palps, legs and entire underside orange. Elytra orange with very broad violet median transverse fascia occupying slightly more than a half of total elytral length. Antennomeres 1-3 orange, 4 very dark reddish brown, 5-10 black, terminal antennomere yellowish covered with dense white pubescence.

Head not shiny, triangular, with medium, prominent, circular and finely faceted eyes. Tempora very short, rounded, 1/2 of length of eye. Head base nearly straight. Frontoclypeal suture narrow and vague, broadly arcuate. Dorsal surface confusedly densely and flat punctured. Intervals smaller than punctures. Ventral surface with punctures more sparse and less coarse. Pubescence long, appressed, orange. Antennae massive, long, almost reaching the second third of elytral length. Antennomeres 2-11 covered with stout, dense semi- and erect setae. Basal antennomere thickened, nearly oval. Second antennomere shortened, and third antennomere on one fifth more long than previous. Antennomeres 7-10 slightly thickened distally, antennomere 10 shortened. Terminal maxillary palpomere strongly securiform. Pronotum not shiny, frontal and basal margins nearly straight, laterally widened before the middle and with flat constriction before the base. Puncture of regular circular form, dense, with intervals mainly smaller than size of punctures. Pubescence orange, as on the head. Sides of pronotum also distinctly and dense punctured. Scutellum subquadrate, not shiny, densely setose. Elytra not shiny, elongate and subparallel, slightly more broad behind the middle. Postbasal transverse impression not indicated. Punctures large and dense in basal half, with intervals nearly equal in size as punctures. Toward apex, punctures becoming smaller and more flat. Pubescence long, appressed, directed obliquely in basal third, posteriorly on the rest of elytra, orange on orange places, violet on median fascia. Whole surface also densely covered with semierect long setae directed posteriorly, orange to grayish in color. Sutural striae very narrow, developed from nearly middle toward the apex. Hind wings fully developed. Legs long, covered with whitish semierect setae. Penultimate tarsomeres distinctly bilobate. Distal tarsomeres large, tarsal claws long, simple. Tibial spurs very short, stout. All tibiae with distinct complete keels along outer and inner surface. Pygidium completely covered by elytra. Pygidium

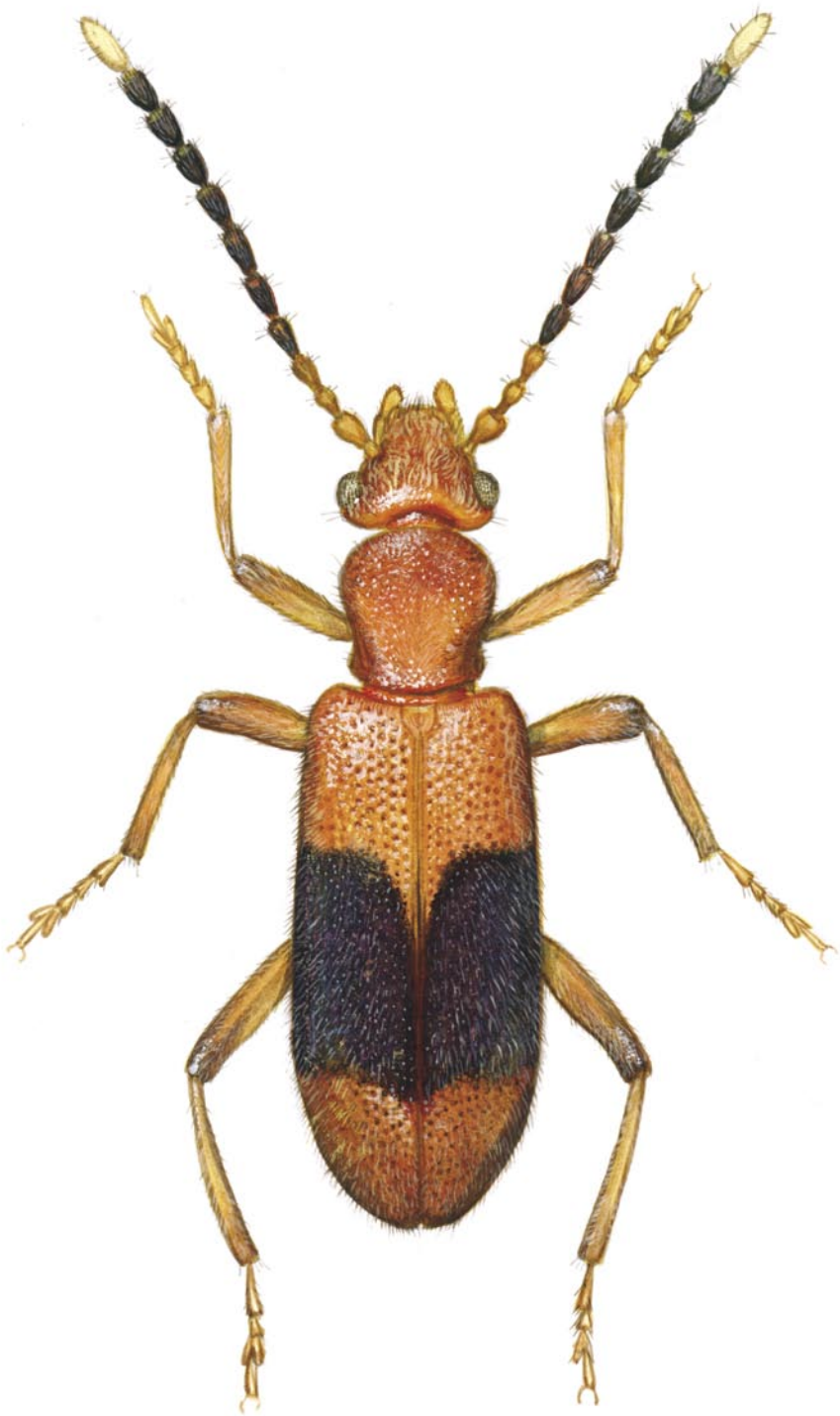


Figure 20: *Lemodes isatabua* sp. nov., habitus, holotype (♂)



Figures 21-24. *Lemodes isatabua* sp. nov.: 21 – pygidium, dorsal (holotypus ♂); 22 – sternite V (holotypus ♂); 23 – spiculum gastrale (holotypus ♂); 24 – aedeagus (holotypus ♂).

of male broadly triangular, rounded apically (Fig. 21). Visible sternite V of male shortly and shallowly excavated on apically (Fig. 22). Spiculum gastrale (Fig. 23). Aedeagus (Fig. 24).

Dimorphism. Female is unknown.

Diagnosis. Due to the unifasciate elytra and orange body, this species is very similar to *Lemodes splendens* Lea (Australia: New South Wales). From that it primarily differs in the completely orange underside (legs are

partly and mesosternum completely black in *L. splendens*), front margin of elytral fascia excavated along the suture and hind margin of this fascia being slightly prolonged along the suture (in *L. splendens*, front margin of elytral fascia is prolonged along the suture and hind margin is slightly excavated along the suture).

Note. Holotypus is lacking right maxillary palpus, antennomeres 4-11 of the right antenna, and 2-5 tarsomeres of right front tarsus.

***Lemodes lauta* sp. nov.** (Figs. 25-29)

Holotypus ♂, NME. INDONESIA or. Irian Jaya, 170km S of Nabire Epomani 1150m 06.I.1996 leg. A. Weigel / Lagriomorpha semicaerulea Champ. det. G. Uhmann [both labels printed].

Derivatio nominis. The name for this colorful species derives from the Latin word “lautus” meaning beautiful, luxurious, excellent.

Measurements of the holotype: total body length mm, maximum width in the middle of elytra 1.40 mm; head 0.91 mm long, through eyes 1.04 mm broad, pronotum 1.06 mm long, maximum width 1.02 mm, elytra 3.58 mm long, 1.40 together broad.

Coloration. Head, pronotum and scutellum dark red, mouth parts orange. Elytra dark blue to violet, suture very narrow violet. Maxillary palps orange to reddish orange. Antennomeres 1-3 red, 4-5 dark red, 6-11 black. Front legs reddish orange, middle mesofemora reddish orange in basal and reddish brown in terminal half, mesotibiae and -tarsi reddish brown. Hind legs coloration similar to middle legs but in general darker. Underside dark red except for sternites II-V which are dark brown, also as pygidium. Terminal antennomere between dense dark brownish pubescence sparsely covered with white hairs. On each elytron with two vague transverse bands of white hairs – first in the middle, second in terminal fourth. Both bands are interrupted on suture.

Head slightly shiny, triangular, with small, prominent, elongate (narrow) and finely faceted eyes. Tempora short, angulate, nearly as long as length of eye. Head base nearly straight. Front-clypeal suture not present. Dorsal surface confusedly coarsely and very densely punctured. Punctures of variable size and intervals much smaller than punctures. Ventral surface with punctures more sparse and less coarse. Pubescence short, semierect, reddish-brown to orange on labrum

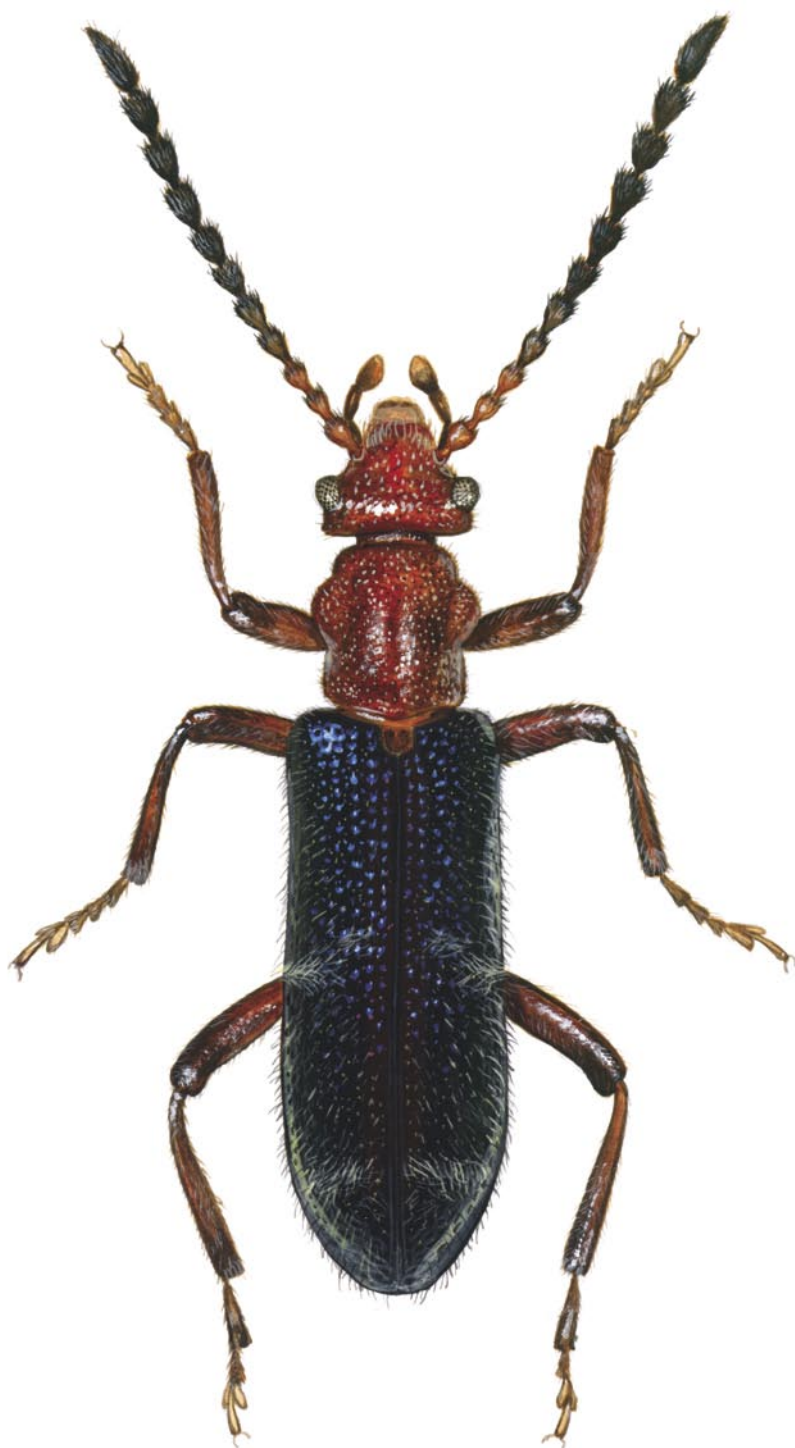


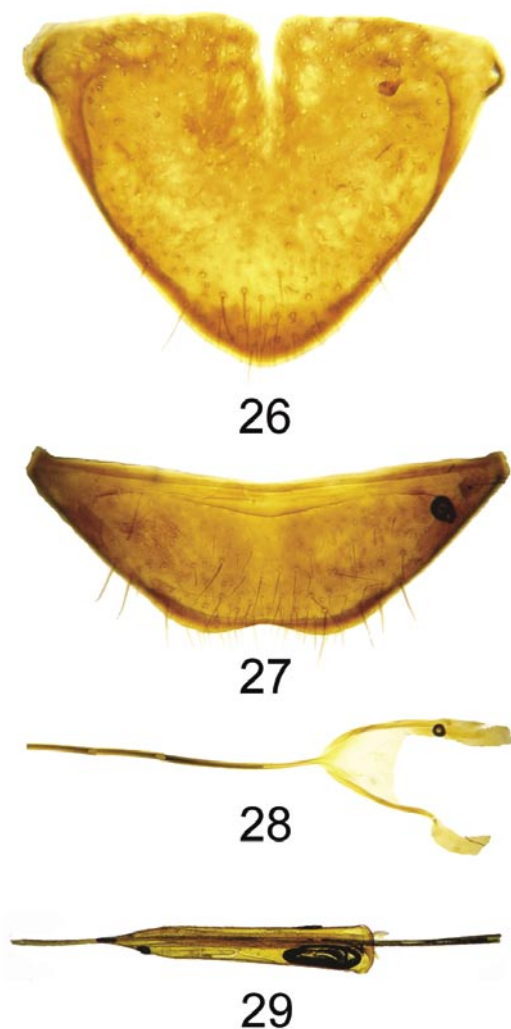
Figure 25: *Lemodes lauta* sp. nov.: habitus, holotype (♂);



and mouth organs. Antennae massive, long, almost reaching the middle of elytral length. Antennomeres 3-11 covered with stout, dense semi- and erect setae. Basal antennomere thickened, nearly oval. Second antennomere short, and third antennomere on one third more long than previous. Antennomeres 5-10 distinctly thickened distally. Terminal maxillary palpomere moderately securiform. Pronotum slightly shiny, frontal and basal margins nearly straight, laterally widened before the middle and with flat constriction before the base. On disk, with flat longitudinal carina beginning on anterior margin and reaching the base. Punctuation similar to that on head, but punctures larger, and of more regular, circular form.. Pubescence reddish, as on the head. Sides of pronotum glossy, almost unpunctured. Scutellum subcircular, slightly shiny, finely punctate and sparsely setose. Elytra distinctly shiny, elongate and subparallel. Postbasal transverse impression very vague indicated. Punctures large and dense in basal half, with intervals smaller than punctures. Toward apex, punctures becoming much smaller and very flat. At least two irregular rows of punctures available along the suture. Base of elytra with two vague and short longitudinal impressions – one near scutellum, other at shoulder. Pubescence black, suberect, directed posteriorly. Two transverse bands of obliquely directed, appressed white hairs in the middle and in apical fourth, both interrupted on suture. Sutural striae narrow, developed from postbasal transverse impression toward the apex. Hind wings fully developed. Legs stout, covered with whitish semierect setae. Penultimate tarsomeres distinctly bilobate. Distal tarsomeres large, tarsal claws long, simple. Tibial spurs very short, stout. All tibiae with distinct keels in basal half of outer and inner surface. Metatibiae slightly curved. Pygidium partly exposed. Pygidium of male broadly triangular, abruptly angulate apically (Fig. 26). Visible sternite V of male shallowly excavated on apical margin (Fig. 27). Spiculum gastrale (Fig. 28). Aedeagus (Fig. 29).

Dimorphism. Female is unknown.

Diagnosis. Due to coloration and structure of dorsal surface this species is related with *Lemodes buratea* sp. nov. From that it differs mainly in having a more densely punctured forebody, having two transverse bands of white hairs on the elytra and by the structure of last ventrite and aedeagus.



Figures 26-29. 26 – pygidium, dorsal (holotypus ♂); 27 – sternite V (holotypus ♂); 28 – spiculum gastrale (holotypus ♂); 29 – aedeagus (holotypus ♂).

#### Additional faunal information on know species of *Lemodes* Boheman, 1858

##### *Lemodes albertisi* Oberthür, 1884

D. N. Guinea Sattelberg. [1 ex. HMNH]; under bark, lowest slem, *Araucaria cunninghamii* Treello. b, Becleigh LTT, Wau, M. Dist; 22.IX.1970, B.Gray / 77 / C.I.E.COLL. A. 4202 [1 ex. BMNH]; Coll. I.R.Sc. N.B. P.N.G., Madang Prov., Baiteta, Canopy Mission 15.VI.1965 Leg. O. Missa [2 ex. IRSN].

*Lemodes coccinea* Boheman, 1858

AUSTRALIE Adelaide XI. 1954.i.G.20.226. Leg Kas-piew [2 ex. IRSN];

AUSTRALIA NSW Mt. Coricudgy / 30.IX.1983 leg. G.Hangay [1 ex. HMNH]; 35.22 S 148.50 E ACT: Brindabella, Blundells Creek 18 Nov. 1988 M. Hansen / in rotten log [20 ex. ZMUC]; AUSTRALIA, N.S.W. Ulladulla (Narrawaley) 1999.I.27-28. leg. A.Podlussany [2 ex. HMNH].

*Lemodes indigacea* (Young, 1978)

PAPUA N. GUINEA Onerunka X 79 nr Kainantu W. G. Ulrich [2 ex. CDT]; PAPUA N. GUINEA Onerunka XI 79 nr Kainantu W. G. Ulrich [1 ex. CDT]; PAPUA N. GUINEA Onerunka XII 79 nr Kainantu W. G. Ulrich

[1 ex. CDT]; W-PAPUA Manokwaki Prov.ca. 18km NW Ransiki, Anggi Gida, Kampung itkau, 1890m, 01°24.23'S, 133°55.53'E, 04. III.2007 leg. A. Skale cutting area / prim. forest [1 ex. NME].

*Lemodes mastersii* MacLeay, 1872

Australia, Richmond River [3 ex. OUNH].

*Lemodes semicoerulea* (Champion, 1916)

Wag. 8 (coll. Wallace) [1ex. OUNH]; NEW GUINEA: NE Wau, 1300 m, VIII.1965 / Coll. J.Sedlacek [1 ex. HMNH]; Indonesia or., Irian Jaya, 170 km S Nabire, Epomani, 1150 m, 06.I.1996, leg. A.Weigel [2 ex. NME]; W-PAPUA Raja Ampat Pr. Lopintol/Waigeo Isl., N Bayon River 07'S, 130°53'E 11.I.2004 leg. A.Weigel UWP KL [1 ex. NME].

## Identification key to species of *Lemodes* Boheman, 1858

- 1 Antennae with 12 antennomeres ..... *L. elongata* Lea
- Antennae with 11 antennomeres ..... 2
- 2 Elytra unicolorously red or blue, with or without bands of transverse whitish hairs ..... 3
- Elytra bi- or multicolorous ..... 11
- 3 Elytra unicolorous black with strong blue or violet metallic shine ..... 4
- Elytra unicolorous red or orange ..... 8
- 4 Head red, reddish-orange or orange ..... 5
- Head black, with our without strong metallic blue shine ..... 6
- 5 Elytra with two transverse bands of white hairs. Forebody very densely punctured, intervals smaller than punctures ..... *L. lauta* sp. nov.
- Elytra with one transverse band of white hairs. Forebody sparsely punctured, intervals equal or larger than punctures ..... *L. buratea* sp. nov.
- 6 Pronotum yellow or orange (orange color is from the dense setae, ground color of the pronotum is dark brown to black), elytra with strong metallic blue or violet shine ..... *L. indigacea* (Young)
- Pronotum of same or nearly same color as elytra ..... 7
- 7 Metasternum moderately globose. Elytra subparallel, transverse hair band broadly interrupted on suture. Base of pronotum with a ring of sparse, long white pubescence. Extreme base of the basal antennomere reddish orange ..... *L. iriana* sp. nov.
- Metasternum strongly globose. Elytra only in basal third subparallel, distinctly widened toward the apex and with maximum width in apical third. Transverse hair band narrowly interrupted on suture. Basal antennomere unicolorous ..... *L. nigrocaerulea* Telnov
- 8 Abdomen black with strong metallic blue shine. Antennae and legs also with distinct metallic blue reflection ..... *L. caeruleiventris* Blair
- Abdomen without metallic blue shine. Antennae and legs without metallic reflection or maximum vague metallic ..... 9
- 9 Legs reddish orange, nearly of same color as dorsal surface of elytra. Antennomeres 4-9 always dark, 1-3 always orange or reddish. Scutellum black, distinctly darker than elytra, rounded on apex ..... *L. mastersii* MacLeay (some specimens of *L. coccinea* Boheman might be completely reddish, but this species can be recognized by scutellum truncate posteriorly)

- Legs darker than elytra; black, brown, reddish brown or vague blue metallic. Antennomeres 1-3 often dark colored ..... 10
- 10 Forebody black, occasionally with dark metallic violet shine. Pubescence of forebody black to brownish. Antennomeres 1-10 dark, only terminal antennomere light ..... ***L. atricollis* Oberthür**
  - Forebody red, orange or black, never metallic shiny. Pubescence of forebody red or orange. Antennomeres 1-3 black or red, antennomeres 9-11, 10-11 or only terminal antennomere light. Scutellum truncate on apex ..... ***L. coccinea* Boheman**
- 11 Elytra red with broad median transverse blue-violet fascia ..... 12
  - Elytra with basal part red or orange and apical part blue, violet or green ..... 13
- 12 Elytral transverse fascia having front margin slightly prolonged along the suture and hind margin irregularly concave ..... ***L. splendens* Lea**
  - Elytral transverse fascia having front margin slightly excavated along the suture and hind margin slightly prolonged ..... ***L. isatabua* sp. nov.**
- 13 On blue-violet zone of each elytron with a cusp-like transverse band of white hairs, broadly interrupted on suture ..... ***L. albertisii* Oberthür**
  - Without groups of white hairs on elytra ..... 14
- 14 Antennomeres 9-11 orange, dense covered with whitish setae. Elytra with apical part dark green ..... ***L. bicolora* sp. nov.**
  - Antennomeres 9-11 dark, covered with black setae (only apex of terminal antennomere lighter). Elytra with apical part dark blue to violet ..... ***L. semicoerulea* (Champion)**

#### Species list of *Lemodes* Boheman, 1858

##### ***Lemodes albertisii* Oberthür, 1884**

OBERTHÜR (1884: 63), as *Lemodes Albertisi*;  
BLAIR (1913: 207); BLAIR (1928: 11), as *Lemodes Albertisi*;  
TELNOV (2004: 90).

Distribution: Papua New Guinea (Madang & West Papua provinces).

##### ***Lemodes atricollis* Oberthür, 1884**

OBERTHÜR (1884: 63); MASTERS (1886: 112); PIC (1906: 56);  
BLAIR (1913: 207); BLAIR (1928: 11); TELNOV (2004: 90).

Distribution: Australia (Victoria).

##### ***Lemodes bicolora* sp. nov.**

Distribution: New Guinea (West Papua).

##### ***Lemodes buratea* sp. nov.**

Distribution: New Guinea (West Papua).

##### ***Lemodes coccinea* Boheman, 1858**

BOHEMAN (1858: 103); LACORDAIRE (1859: 604, note);  
MASTERS (1886: 112); OBERTHÜR (1884: 62-63);  
LEA (1896: 283); LEA (1906: 226-227);  
BLAIR (1913: 207-208); BLAIR (1928: 11);  
TELNOV (2004: 90).

Distribution: Australia (Australian Capital Territory, New South Wales, Queensland, Victoria).

##### ***Lemodes caeruleiventris* Blair, 1912**

BLAIR (1912: 533), as *L. caeruleiventris*;  
BLAIR (1913: 207), as *L. caeruleiventris*; BLAIR (1928: 11).

Distribution: Australia (Queensland).

##### ***Lemodes elongata* Lea, 1896**

LEA (1896: 282); PIC (1906: 56);  
BLAIR (1913: 207); BLAIR (1928: 11).

Distribution: Australia (New South Wales).

##### ***Lemodes indigacea* (Young, 1978)**

YOUNG (1978: 105), as *Lagriomorpha indigacea*;  
GRESSITT & HORNABROOK (1985: plate 2), as *Lagriomorpha indigacea*;  
TELNOV (2004: 90).

Distribution: New Guinea (both Papua & West Papua).

##### ***Lemodes iriana* sp. nov.**

Distribution: New Guinea (West Papua).

##### ***Lemodes isatabua* sp. nov.**

Distribution: Solomon islands (Guadalcanal).

##### ***Lemodes lauta* sp. nov.**

Distribution: New Guinea (West Papua).

### ***Lemodes mastersii* MacLeay, 1872**

MACLEAY (1872: 308), as *Lemodes Mastersi*;  
OBERTHÜR (1884: 62), as *Lemodes coccinea* = *L. Mastersi*  
**syn. nov.**; MASTERS (1886: 112), as *Lemodes Mastersi*;  
LEA (1896: 283), as *Lemodes Mastersi*;  
LEA (1906: 226), as *Lemodes Mastersi*; BLAIR (1913: 207);  
BLAIR (1928: 11), as *Lemodes Mastersi*.

Distribution: Australia (Queensland).

### ***Lemodes nigrocaerulea* Telnov, 2004**

TELNOV (2004: 88), as *Lemodes nigrocaeruleus*.

Distribution: Papua New Guinea (Morobe province).

### ***Lemodes semicoerulea* (Champion, 1916)**

CHAMPION (1916: 396), as *Lagriomorpha semicaerulea*;  
BLAIR (1928: 12), as *Lagriomorpha semicaerulea*;  
YOUNG (1978: 107-108), as *Lagriomorpha semicoerulea*;  
TELNOV (2004: 90).

Distribution: New Guinea (both Papua & West Papua, including satellite islands on western coast).

### ***Lemodes splendens* Lea, 1906**

LEA (1906: 226); BLAIR (1913: 207); BLAIR (1928: 11).

Distribution: Australia (New South Wales, Queensland ?).

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