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Autor: Bezdk, Jan
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**A contribution to knowledge of the genus *Liroetoides* Kimoto, 1989
(Coleoptera, Chrysomelidae, Galerucinae),
with description of *L. geiseri* sp.nov. from Laos**

by Jan Bezděk

Abstract. *Liroetoides geiseri* sp.nov. from Laos is described, illustrated and compared with closely related *L. fulvus* Kimoto, 1989. Male and female genitalia are figured the both species. The aedeagus and the abdomen of *L. fulvus* are described for the first time. Based on the peculiar structure of aedeagus, the genus *Liroetoides* Kimoto, 1989 is compared with the similar genera *Siemssenius* Weise, 1922, *Luperogala* Medvedev et Samoderzhnikov, 1989, *Liroetis* Weise, 1889 and *Coeligetes* Jacoby, 1884.

Key words. Coleoptera – Chrysomelidae – Galerucinae – *Liroetoides* – new species

Introduction

KIMOTO (1989) described the genus *Liroetoides* with one species *L. fulvus* from South Vietnam. In the original description *Liroetoides* is very briefly and inadequately compared only with genera *Liroetis* Weise, 1889 and *Dercetina* Gressitt et Kimoto, 1963. Moreover, some important characters of *L. fulvus*, particularly the aedeagus and male abdomen, were neither illustrated nor described in the original contribution. Such insufficient description and generic diagnosis rendered the correct placement of *Liroetoides* in Galerucinae uncertain.

A number of years ago, I was given the opportunity to borrow and examine four paratypes of *L. fulvus* from BPBM. Last year I received quite prolific and very interesting Galerucinae material from NHMB, collected recently in Laos, which contained the second known species of *Liroetoides* described below.

Material and methods

All measurements were made using an ocular grid mounted on the MBS-10 stereomicroscope (at 16× magnification for the body length and 32× magnification for the remaining measurements). The photograph of holotype of *L. geiseri* sp.nov. was taken with a Canon EOS 550D with an MP-E65mm macro lens and set up with Helicon Focus 5.1 software.

The material examined is housed in the following collections:

| | |
|------|--|
| BPBM | Bernice P. Bishop Museum, Honolulu, Hawaii, USA (Al Samuelson, Shepherd P. Myers) |
| JBCB | Jan Bezděk collection, Brno, Czech Republic |
| NHMB | Naturhistorisches Museum, Basel, Switzerland (Michael Geiser, Michel Brancucci) |
| NMPC | National Museum, Praha, Czech Republic (Jiří Hájek) |

Exact label data are cited for all type specimens: a double slash (//) divides data on different labels and a single slash (/) divides data on different lines. Other comments and remarks are placed in square brackets: [p] – preceding data are printed, [w] – white label, and [b] – blue label.

Taxonomy

Liroetoides geiseri sp.nov.

(Figs 1, 4, 6, 7, 9, 11)

Type locality. Laos, Houa Phan prov., Phou Pane Mt.

Type material. Holotype (male), labelled: “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. [w, p] // NHMB Basel, NMPC Prague / Laos 2009 Expedition: / M. Brancucci, M. Geiser, / Z. Kraus, D. Hauck, V. Kubáň [w, p]” (NHMB). Paratypes: 1 male, same data as in holotype (NMPC); 1 male, labelled: “LAO-NE, Hua Phan prov., / ~20°12′N 104°01′E, / PHU PHAN Mt., 1500– / 1900m, 17.v.–3.vi.2007, / M. Brancucci leg. [w, p] // NHMB Basel / expedition to / Laos, 2007 [w, p]” (JBCB); 2 males and 1 female, labelled: “LAO-NE, Hua Phan prov., / ~20°12′N 104°01′E, / PHU PHAN Mt., 1500– / 1900m, 17.v.–3.vi.2007, / Vít. Kubáň leg. [w, p] // NHMB Basel / expedition to / Laos, 2007 [w, p]” (NHMB); 1 male, labelled: “LAOS-CE; Boli Kham Xai prov / Ban Nape (8 km NE); ~600m; / 18°21′N 105°08′E; / Pacholátka leg.; 1.–18.v.2001 [w, p]” (NHMB); 1 female, labelled: “LAOS, 1–18.v.2001, / Bolikhamxai prov., / 18°21′N 105°08′E, / Ban Nape (8 km NE), / ~600m, Vít Kubáň leg. [w, p]” (NHMB). The specimens are provided with additional printed red label: ‘HOLOTYPUS [or PARATYPUS], / *Liroetoides geiseri* sp. nov., / J. Bezděk det., 2012’.

Description. Body length: males 8.0–8.9 mm (holotype 8.0 mm); females 9.3–9.4 mm.

Holotype (male, Fig. 1): Body elongate, subparallel, slightly extended at the rear, almost glabrous. Body, antennae and legs completely yellow, only apices of mandibles darkened, claws brown.

Labrum transverse, six long, pale setae in transverse row midway, anterior margin straight. Anterior part of head semi-opaque, sparsely covered in large punctures bearing long, pale setae; frontal and anterofrontal ridges well developed, anterior margin of anterofrontal ridge widely incised in triangular fashion, ridges together forming a triple-pointed star structure. Eyes large, strongly protruding from outline of head. Interocular space 1.2 times as wide as transverse diameter of eye. Frontal tubercles subpentagonal, covered in very fine microsculpture, distinctly elevated, separated from each other and from vertex by thin furrow, anterior tips divergent, separated by posterior end of frontal ridge. Vertex lustrous, moderately convex, slightly impressed behind frontal tubercles, in middle with indistinct finely impressed line; with fine punctures, more dense behind frontal tubercles, not so easily visible on disc; area behind frontal tubercles and along eyes covered with short, dense setae (more easily seen in lateral view), disc and lateral parts of vertex glabrous. Antennae filiform, 0.8 times as long as body, length ratios of antennomeres I–IX are: 12-4-11-16-16-15-16-15-14-14-15 (10 = 0.5 mm). Maxillar palpi: penultimate palpomere short, divergent apically, around as long as wide; ultimate palpomere small, short, subtriangular.

Pronotum transverse, 1.75 times as broad as long, widest at first third. Surface evenly and moderately convex, lustrous, with sparse, fine punctures, glabrous. Anterior margin slightly concave, unbordered; posterior margin straight around midway, laterally moderately rounded, distinctly bordered; lateral margins moderately rounded in anterior

half, posterior part straight and convergent, distinctly bordered. Anterior angles swollen, prominent, produced anterolaterally, posterior angles small, triangular. All angles with setigerous pore bearing one long pale seta, lateral margins near anterior angles with several short setae.

Scutellum subtriangular with widely rounded apex, covered with fine microsculpture and small distinct punctures, semiopaque, glabrous.

Elytra 0.75 time as long as body, 2.05 times as long as wide (measured at humeral calli), lustrous, slightly divergent posteriorly, densely covered with small, confused punctures, glabrous, only apical and lateral slopes with very sparse setae. Humeral calli well developed, surface along inner margin of humeral calli distinctly impressed. Epipleura basally wide, gradually tapering and disappearing before apex. Macropterous.

Legs moderately long and narrow, semiopaque, densely covered in pale setae. Protarsomere I narrow, apically slightly dilated, 0.81 times as long as the two following tarsomeres combined, 0.53 times as wide as protarsomere III. Length ratios of protarsomeres I–IV are: 9-6-5-8. Metatarsomere I elongate, narrow, apically slightly dilated, 1.25 times as long as the two following tarsomeres combined, 0.47 times as wide as metatarsomere III. Length ratios of metatarsomeres I–IV are: 19-8-7-9. Claws appendiculate.

Ventral surface lustrous, finely punctate and covered in pale hairs. Abdomen (Figs. 7, 9, 11): posterior margin of ventrite IV at centre with subtriangular process with widely rounded apex, obliquely bent inwards and clearly visible in ventral view, middle part of posterior margin nearly vertical; ventrite V with two large, transverse, oval cavities separated by thin narrow keel, anterior margin with small shallow triangular impression midway, posterior margin with three processes: middle process triangular with apex bent downwards, and two lateral subtriangular processes (larger than middle one), each with widely rounded apex and shallowly impressed surface; narrow and shallow impression along lateral margins of ventrite V.

Aedeagus (Fig. 4): apex arrowhead-shaped, with the lateral tips slightly downturned in lateral view; apical third narrow, progressively extended towards apex; lateral margins distinctly widened at one-third, forming small lateral angulation; basal two-thirds almost parallel; dorsally with long dorsal plate widened at base, then parallel and narrow, ending at level of lateral angulations; ventrally with long deep furrow, thin at apex, gradually widened to a third of aedeagus length and then parallel.

Female: Interocular space slightly wider than in male, 1.35 times as wide as transverse diameter of eye. Abdomen with no cavities or processes, last ventrite evenly and moderately convex, posterior margin evenly rounded. Spermatheca (Fig. 6): cornu narrow, regularly rounded, almost U-shaped, narrower than nodulus, nodulus small, proximal spermathecal duct basally as wide as nodulus, right lateral margin then narrowed and again extended at gland insertion, then progressively tapering.

Etymology. Dedicated to Michael Geiser (NHMB), a participant in the Laos expeditions during which the new species of *Liroetoides* was collected.

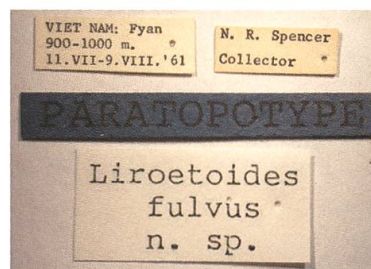
Differential diagnosis. *Liroetoides geiseri* sp.nov. can be distinguished from *L. fulvus* by the following characters: on average slightly smaller (8.0–9.4 mm, *L. fulvus*: 8.8–9.8 mm); rear of last abdominal ventrite in male with median triangular process and two



1



2



3

Figs 1–3. Type specimens of *Liroetoides*. 1 – *L. geiseri* sp.nov. (male, holotype), 2 – *L. fulvus* Kimoto, 1989 (male, paratype), 3 – labels of paratype of *L. fulvus*.

large lateral plates with rounded apices, surface with two large transverse cavities separated by thin keel (in males of *L. fulvus*, last abdominal ventrite with median and lateral processes much smaller and closer to each other, surface evenly concave, with no cavities); aedeagus with arrowhead-shaped apex, in lateral view only slightly bent downwards (aedeagus of *L. fulvus* with triangular apex, in lateral view widely and regularly rounded with apex bent upwards).

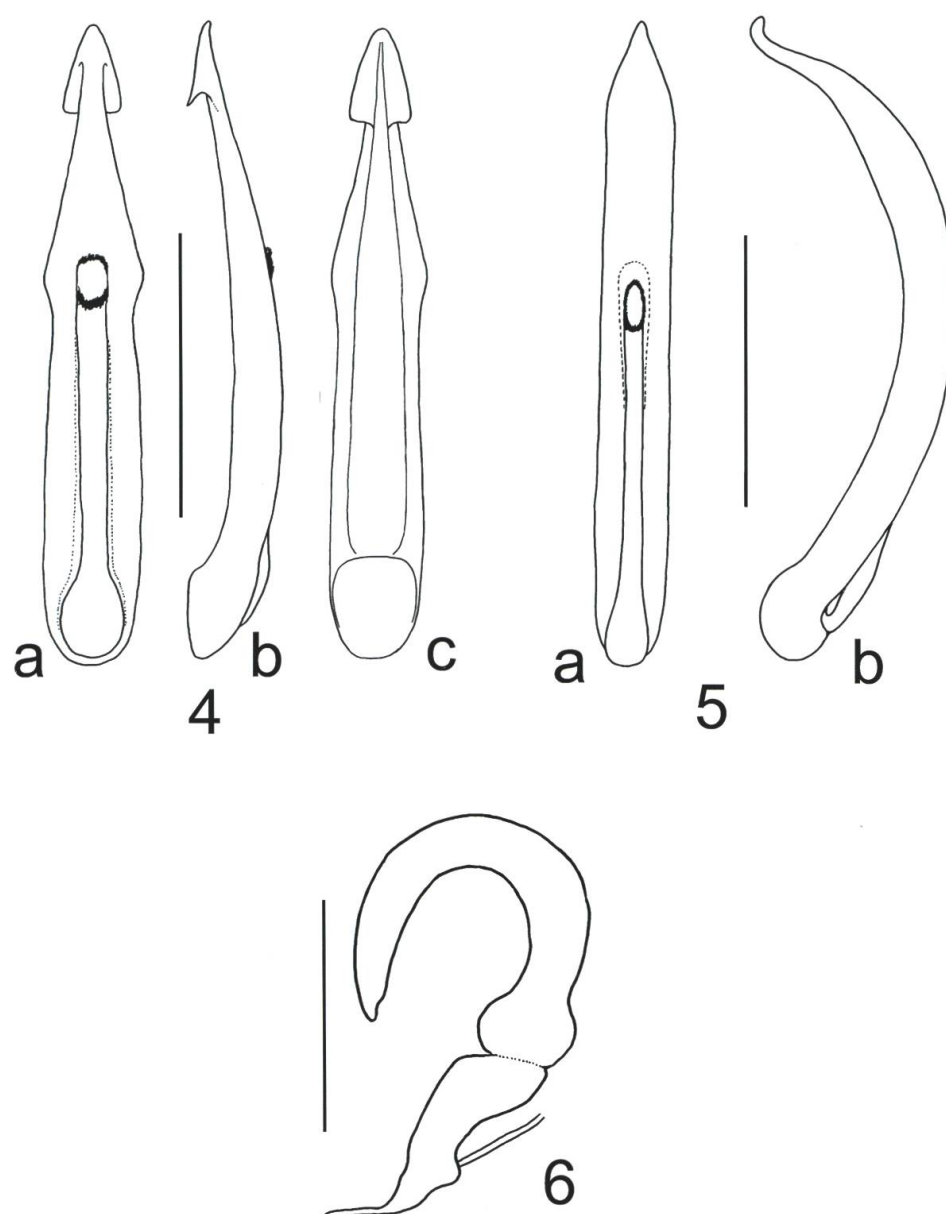
Distribution. North and Central Laos.

***Liroetoides fulvus* Kimoto, 1989**

(Figs 2, 3, 5, 8, 10, 12)

Liroetoides fulvus Kimoto, 1989: 159.

Type material. 3 paratypes (males), labelled: “VIET NAM: Fyan / 900–1000 m. / 11.VII–9.VIII.‘61 [w, p] // N. R. Spencer / Collector [w, p] // PARATOPOTYPE [b, p] // *Liroetoides* / *fulvus* / n. sp. [w, p]” (BPBM); 1 paratype (female), labelled: “VIET NAM: Dalat / 6 km S., 1400–1500 m / 9.VI–7.VII.1961 [w, p] // N. R. Spencer / Collector / BISHOP [w, p] // PARATYPE [b, p] // *Liroetoides* / *fulvus* / n. sp. [w, p]” (BPBM).



Figs 4–6. Genitalia of *Liroetoides*. 4 – aedeagus of *L. geiseri* sp.nov. (a – dorsal, b – lateral, c – ventral view), 5 – aedeagus of *L. fulvus* (a – dorsal, b – lateral), 6 – spermatheca of *L. geiseri* sp.nov. Scales: 1 mm for Figs 4–5, 0.25 mm for Fig. 6.

[Described from 18 specimens. Holotype and some of the paratypes are deposited in BPBM, the other paratypes probably deposited in the Kitakyushu Museum and Institute of Natural History, Fukuoka (Japan).]

Additions to description. Aedeagus (Fig. 5): in dorsal view parallel, with triangular apex, dorsal plate narrow, basally slightly widened; in lateral view widely and regularly rounded, apex upturned.

Male abdomen (Figs 8, 10, 12): Ventricle IV at rear centre with small, almost semicircular, process placed vertically as well as middle part of posterior margin of

ventrite (almost out of sight in ventral view, except small two small incisions), in lateral view the posterior part of ventrite is elevated; ventrite V with moderately concave surface, posterior margin with small triangular process midway and two somewhat larger subtriangular plates, posterior margin of ventrite with small, shallow incisions near the bases of larger plates.

Distribution. South Vietnam (KIMOTO 1989).

Discussion

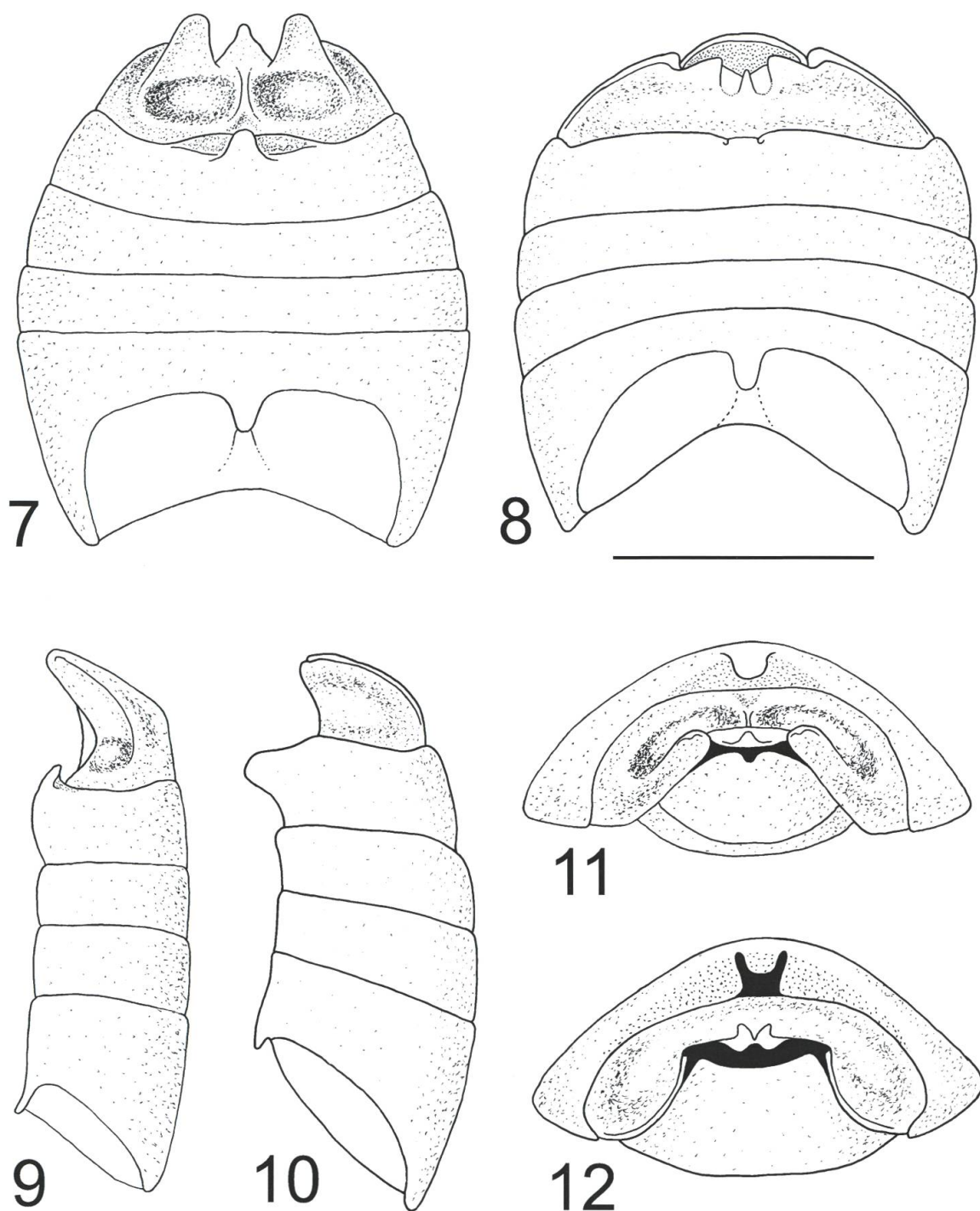
Genus *Liroetoides* is closely related to *Siemssenius* Weise, 1922 (= *Pseudoliroetis* Laboissière, 1929) (eight species in South-east Asia); *Luperogala* Medvedev et Samoderzhnikov, 1989 (two species from North Vietnam); *Liroetis* Weise, 1889 (about 30 species in South-east Asia, India and Malaysia), *Zangia* Chen, 1976 (5 species from China) and *Coeligetes* Jacoby, 1884 (four species from Malaysia and Indonesia) (see e.g. JIANG 1988, 1990, MEDVEDEV & SAMODERZHENKOV 1989, MOHAMEDSAID 1994, BEENEN 2010, BEZDĚK 2012). All these genera form a group characterised by aedeagus with presence of a dorsal process starting near the base and directed forwards.

SEENO & WILCOX (1982) listed the genera *Liroetis*, *Siemssenius* and *Coeligetes* within section Exosomites (tribe Luperini, subtribe Luperina). The correctness of their position in this section is called doubt by the dorsal process of the aedeagus. However, additional studies that extend the work of the current paper are needed to resolve the position of these genera within the Galerucinae system. I cannot rule out the future possibility of moving these genera to a separate unit within Galerucinae.

All the genera mentioned (except *Zangia*) can be distinguished by the set of characters keyed below – mainly anterior coxal cavities open/closed, bordered/unbordered anterior margin of pronotum, shape of male abdomen with strongly modified ventrites IV and V, and structure of aedeagus. Genus *Zangia* is not included in the key because (to date) the description is published in Chinese with only a very short English summary, so important characters cannot be detected. Based on the drawings of aedeagi of all five *Zangia* species published by JIANG (1990), this genus is closely related or even perhaps congeneric with *Liroetis*.

LOPATIN (2004) described *Liroetis* subgenus *Liroetinus* based on the newly-described species *L. belousovi* from China (Sichuan). The structure of aedeagus (with no dorsal process) and pronotum with transverse impressions allow me to doubt its correct placement in *Liroetis*. However, further study of the type material is necessary to resolve its classification.

The shape of the anterior coxal cavities (open/closed posteriorly) is often used to separate various genera and is considered very important in modern taxonomical literature dealing with Galerucinae. Although its importance and generic stability have been questioned recently, e.g. for genera *Monolepta* Chevrolat, 1836 (Wagner 2003), *Menippus* Clark, 1864 (REID & NALLY 2008) or *Erganoides* Jacoby, 1903 (BEENEN & LEE 2010), in the group of genera addressed herein treated group appears to be stable (anterior coxal cavities closed in *Liroetoides* and *Coeligetes*, open in *Siemssenius*, *Luperogala* and *Liroetis*).



Figs 7–12. Male abdomen of *Liroetoides*. 7, 9, 11 – *L. geiseri* sp.nov., 8, 10, 12 – *L. fulvus*. (7, 8 – ventral, 9, 10 – lateral, 11, 12 – rear view). Scale 2 mm.

A key to identification of *Liroetoides* and related genera

1. Anterior coxal cavities closed posteriorly. 2.
- Anterior coxal cavities open posteriorly. 3.
2. Anterior margin of pronotum unbordered. Pronotum approx. 1.7–1.8 times as wide as long. Abdominal ventrite IV in male with posterior margin rising abruptly to the vertical, with small subtriangular process midway. Abdominal ventrite V in male transversely concave or with two transverse cavities, posterior margin with three more or less developed subtriangular processes. Aedeagus relatively long and narrow, with dorsal plate short, narrow, simple, ending a little beyond centre of aedeagus. ***Liroetoides***
- Anterior margin of pronotum bordered. Pronotum approx. 2.0–2.3 times as wide as long. Abdominal ventrite IV in male slightly medially impressed or with deep narrow incision halfway along posterior margin. Abdominal ventrite V in male with two incisions well developed on posterior margin and surface with shallow, longitudinal groove. Aedeagus relatively short with dorsal process basally thin and apically abruptly extended, usually with brush of hairs. ***Coeligetes***
3. Anterior margin of pronotum unbordered. Males not available for this study. ***Siemssenius***
- Anterior margin of pronotum bordered. 4.
4. Abdominal ventrite IV in male with large long sword-like process from posterior margin directed backwards. Abdominal ventrite V in male with large longitudinal cavity in the middle for insertion of process of ventrite IV. Pronotum approx. 1.8 times as wide as long. Dorsal process of aedeagus complicated and longer than aedeagus. ***Luperogala***
- Abdominal ventrite IV in male with posterior margin vertically bent, often with very small incision midway. Abdominal ventrite V in male with two well-developed incisions on posterior margin, surface with shallow to deep, wide, longitudinal groove. Pronotum approx. 1.4–1.5 times as wide as long. Dorsal process of aedeagus shorter or as long as aedeagus. ***Liroetis***

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Author's address:

Jan Bezděk
Mendel University
Department of Zoology
Zemědělská 1
CZ–613 00 Brno
CZECH REPUBLIC
E-mail: bezdek@mendelu.cz