

New species and new records of Agyrtidae (Coleoptera) from China, India, Myanmar, Thailand and Vietnam

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Abstract. Three new species of the family Agyrtidae are described from China: *Apteroloma belousovi* sp. nov. (Sichuan province), *Apteroloma jelineki* sp. nov. and *Ipelates schuelkei* sp. nov. (both Yunnan province). Female of *Apteroloma qinlingense* Rougemont, 2001 is redescribed. *Necrophilus chinensis* Zhou, 2005 is considered as a junior subjective synonym of *N. sichuanensis* Nikolaev, 2003. First records are given for *Necrophilus rupinensis* Schawaller, 1986 and *Pteroloma forsstromii* (Gyllenhal, 1810) from China and *Ipelates sikkimensis* (Portevin, 1905) from India: Arunachal Pradesh, Myanmar and Thailand. Species of agyrtid genera mentioned from China and adjacent countries are keyed.

Key words. Coleoptera, Agyrtidae, *Apteroloma*, *Ipelates*, taxonomy, new species, new synonymy, distribution, China, India, Myanmar, Thailand, Palaearctic Region, Oriental Region

Introduction

The Agyrtidae are a small family of beetles, with 70 extant species worldwide (NEWTON 2005, including additional recently described species in NISHIKAWA (2002), NIKOLAEV (2003), RŮŽIČKA et al. (2004) and SCHAWALLER (2005)). Some genera and/or species exhibit a disjoint or relic distribution pattern (NEWTON 2005). In the Eastern Palaearctic and Oriental Regions, most of the species are restricted to mountainous and submountainous habitats, mostly near timberline; for example, exact data from Nepal were given by SCHAWALLER (2005: 119, Fig. 19).

The present paper is an addition to a recent revision of *Apteroloma* Hatch, 1927 (RŮŽIČKA et al. 2004). Two new species are described here, which extends the known distribution of the genus significantly southward to southern Sichuan and western Yunnan provinces of China. Furthermore, a new species of *Ipelates* Reitter, 1885 is described from western Yunnan province and a new synonymy is established for two species of *Necrophilus* Latreille, 1829 from Sichuan province, independently but almost synchronously described by authors from Kazakhstan and China. In addition, further distributional records of various agyrtid species from China, Thailand and Vietnam are added, based both on old museum specimens and recently collected material, accumulated by Czech, German, English and Russian collectors.

Material and methods

Specimens for this study came from the following museums and private collections (acronyms according to ARNETT et al. 1993):

AFUA	Department of Biology, Al-Farabi Kazakh National University, Almaty, Kazakhstan (G. V. Nikolaev);
APEG	Andreas Pütz collection, Eisenhüttenstadt, Germany;
BMNH	Natural History Museum, London, UK (M.V.L. Barclay);
JCHC	Jonathan Cooter collection, Hereford, England;
JRPC	Jan Růžička collection, Praha, Czech Republic;
JSPC	Jan Schneider collection, Praha, Czech Republic;
MHNG	Muséum d'Histoire Naturelle, Genève, Switzerland (G. Cuccodoro);
MTDC	Miloš Trýzna collection, Děčín, Czech Republic;
SMNS	Staatliches Museum für Naturkunde, Stuttgart, Germany (W. Schawaller);
ZMAS	Zoological Museum, Academy of Sciences, St. Petersburg, Russia (M. G. Volkovich);
ZMHB	Zoologisches Museum der Humboldt-Universität, Berlin, Germany (M. Uhlig).

Specimens of the newly described species are provided with one red printed label 'HOLOTYPE [or PARATYPE] / [Name of the taxon] sp. nov. (male or female symbol) / J. Růžička & / A. Pütz det. 2009'. Exact label data are cited only for the type material. Separate lines on labels are indicated (only for primary types) by '/', separate labels by '//'. Author's remarks and comments are found in square brackets. [p] – preceding data are printed; [h] – preceding data are hand-written.

Photographs were taken using an Olympus SZX9 stereomicroscope and multiple (9–14) layers of focus combined in the Helicon Focus 4.21 software. The following abbreviations are used for body measurements: EL – length of elytra (measured from caudal tip of scutellum to elytral apex), EW – combined maximum width of elytra, PBW – basal width of pronotum, PML – medial length of pronotum, PMW – maximum width of pronotum, TBL – total body length (measured from anterior margin of head to elytral apex). E is used for east, N for north, S for south and W for west in geographical data. All ratios given in descriptions were calculated from measurements made on specimens in dorsal view using an ocular micrometer on a stereoscopic dissecting microscope (with a magnification $\times 16$ for TBL, $\times 32$ for other measurements). Morphological terms used mostly follow NEWTON (1997), term 'ventro-medial sclerite' on female genitalia follows RŮŽIČKA (1994). Diagnostic description generally follows RŮŽIČKA et al. (2004) for *Apteroloma* and SCHAWALLER (2005) for *Ipelates*.

Results

Subfamily Agyrtinae

Ipelates sikkimensis (Portevin, 1905)

Sphaeroloma sikkimensis Portevin, 1905: 422.

Brachyloma sinense Portevin, 1914: 219 (conditionally synonymized by SCHAWALLER (1983)).

Ipelates sikkimensis: SCHAWALLER (1983) (redescription, new generic combination).

Material examined. **INDIA: ARUNACHAL PRADESH:** Mishmi Hills, Delai valley, Taphlogam (ca. 28°17' N, 96°33' E), 4600–5000 ft (= 1400–1525 m), 7.xi.1936, M. Steele leg., B.M. 1937-324., 2 ♂♂ (BMNH). **MYANMAR:** Mishmi Hills, Chhagion, 5350 ft (= 1630 m), 25.ii.–11.iii.1935, M. Steele leg., B.M. 1935-312., 1 ♂ (BMNH). **THAILAND:**

CHIANG DAO DISTRICT: Do Chiang Dao Wildlife Sanctuary (ca. 19°21' N 098°59' E), 510 m, 23.xi.1990, P. Schwendinger leg., 1 ♂ 1 ♀ (MHNG); same data, 1 ♂ (JRPC). **VIETNAM:** Tonkin, Hoa Binh (ca. 20°50' N 105°13' E), without date, H. Perrot leg., Coll. H. Perrot in Coll. M. Curti, 2 ♂♂ (MHNG).

Distribution. Widely distributed species, known from northern India: Uttarakhand (= Uttaranchal), Sikkim, West Bengal (SCHAWALLER 1983, 1991), central and eastern Nepal (SCHAWALLER 1983, 1991), China: Yunnan province (SCHAWALLER 1991, 1999) and Fujian province (SCHAWALLER 1991), and northern Vietnam (SCHAWALLER 1983). First records from India: Arunachal Pradesh, Myanmar and Thailand.

Ipelates schuelkei sp. nov.

(Figs. 4, 15)

Type locality. China, Yunnan province, Gaoligong Shan mts, pass 21 km NW Liuku.

Type material. HOLOTYPE: ♀, 'CHINA: Yunnan [province] (CH07-26), Nujiang / Lisu Aut.[onomous] Pref.[ecture], Gaoligong Shan [mts], pass 21 / km NW Liuku, 3150 m, 25°58'22"N, / 98°41'00"E, bamboo with shrubs, litter / sifted, 9.VI.2007, M. Schülke [leg.] [p]' (APEG, will be deposited in ZMHB). PARATYPE: 1 ♀, same data as holotype (JRPC).

Diagnostic description. Measurements of the female holotype: TBL 3.7 mm, PMW/PML 1.93, PMW/PBW 1.01, EL/EW 1.03, EW/PMW 1.27.

Body small in size, 3.7 mm and 4.1 mm long. Dorsum light brown; antennae, mouthparts and legs uniformly light brown (Fig. 4). Dorsal surface very shiny, without any traces of microsculpture on head and pronotum. Head with regular and dense, fine punctation; vertex without impression; clypeal suture distinct, upraised, v-like; clypeus straight, not excavated.

Mandible without inner tooth. Antenna relatively short and stout, proportions of antennal segments as in Fig. 4, antennomere 3 long, antennomeres 8–10 with dense sensillae in an apical groove.

Pronotum widest shortly before base, basal margin completely and distal margin medially unbordered, lateral margins smooth, without serration, finely and completely bordered; anterior corners protruding and rounded, posterior corners rectangular, prolonged into short process; disc of pronotum distinctly vaulted, sides flattened; with irregular punctation laterally, punctures of larger diameter than those on head, disc with only a few scattered punctures (Fig. 4). Propleura without punctation.

Elytra very convex and round, with nine rows of punctures arranged in longitudinal striae, stria 3 with ca. 41 punctures; punctures in rows distinctly larger than pronotal punctures, punctures in row 9 two times larger and more sparsely arranged than those in inner rows. Interstriae convex, impunctate, with feeble transverse microsculpture, 4–5 times as wide as punctures in the rows; epipleural keel (external interval sensu SCHAWALLER (2005)) very wide, laterally bent upwards (Fig. 4), lateral margin of elytra distinctly and completely serrate. Epipleura ventrally with distinct and scattered deep punctures on its basal part, diameter of punctures comparable to those of the elytral rows. Hind wings fully reduced.

Metasternum with sparse and superficial punctures, abdominal sternites shining, without punctures. Ventrites III to VI on inflexed lateral portions with dense array of sharp teeth.

Male. Unknown.

Female. Posterior margin of ventrite VIII with narrow emargination, spiculum ventrale very wide, anterolaterally with projections (Fig. 15). Ovipositor with narrow valvifer without setae,

very elongate coxite with one basal and several apical setae (only two apical setae larger), and sparsely setose digitiform stylus.

Differential diagnosis. *Ipelates* Reitter, 1885 is a small genus with 12 valid species, which are quite heterogeneous in size and external morphology (NEWTON 1997, SCHAWALLER 1983, 2005). Currently, there is no available hypothesis about the phylogeny within this genus. Although the new species is known only from two females, we decided to formally describe and name it because it can be well characterized by its external morphology.

By its small size, *Ipelates schuelkei* sp. nov. resembles *I. indicus* (Hlisnikovský, 1963) and *I. sikkimensis* (Portevin, 1905), which are also reported from this region (Myanmar and China: Sichuan province for *I. indicus* (SCHAWALLER 1983, 1999); Thailand and China: Yunnan province for *I. sikkimensis*, see above for references). It clearly differs by its short antennae, distinctly vaulted disc and flattened lateral areas of the pronotum, rectangular posterior corners of the pronotum and very convex elytra with very wide epipleural keel (Fig. 4). In *I. indicus* and *I. sikkimensis*, the antennae are longer, pronotum evenly convex with posterior corners rounded, and elytra regularly convex with narrow epipleural keel (SCHAWALLER 2005: 116, Figs. 7, 11).

Ipelates schuelkei sp. nov. shares most character states with *I. schmidti* Schawaller, 2005 from central Nepal and *I. jumlanus* Schawaller, 2005 from western Nepal: the pronotum is widest shortly before base, with posterior corners rectangular and disc with only a few scattered punctures and smooth surface, and the lateral margin of the elytra is completely serrate. However, *I. schmidti* has very fine punctures laterally on pronotum and only a narrow epipleural keel (SCHAWALLER 2005: 116, Fig. 10) and *I. jumlanus* is distinctly larger (body length 5.5–6.0 mm), with elytral interstriae glabrous without microsculpture (SCHAWALLER 2005: 116, Fig. 8).

Etymology. Patronymic, named in honour of Michael Schülke (Berlin, Germany), specialist in Staphylinidae and collector of the type series.

Bionomics. Both specimens were sifted from bamboo leaf litter and the upper humus layer in a habitat covered with dense bamboo vegetation and single shrubs on a slope below the pass.

Distribution. *Ipelates schuelkei* sp. nov. is known so far only from the type locality in China: Yunnan province, close to the border with Myanmar (Fig. 27).

Key for species of *Ipelates* Reitter, 1885 of China and adjacent countries

The key is modified from SCHAWALLER (1983).

- 1 Elytra with wide to very wide epipleural keel; lateral margin of elytra distinctly serrate (Fig. 4; SCHAWALLER 1983: 107, Fig. 3; SCHAWALLER 2005: 116, Fig. 8). 2
- Elytra with narrow epipleural keel; lateral margin of elytra distinctly serrate or simple, without serration (SCHAWALLER 1983: 107, Fig. 1; SCHAWALLER 2005: 116, Figs. 6, 7, 9–11). 4
- 2 Body length 3.7–4.1 mm, body compact (Fig. 4). Pronotal disc without punctures (Fig. 4); elytral interstriae with transverse microsculpture (Yunnan province: Gaoligong Shan mts). *I. schuelkei* sp. nov.

- Body length 5.5–6.2 mm, body more flat (SCHAWALLER 1983: 107, Fig. 3; SCHAWALLER 2005: 116, Fig. 8). Pronotum everywhere regularly punctate, punctures large or very fine; elytral interstriae without transverse microsculpture. 3
- 3 Body length 6.2 mm. Pronotum with large, regularly distributed punctures on its surface, posterior corners elongate laterally (SCHAWALLER 1983: 107, Fig. 3); elytra with very wide epipleural keel (SCHAWALLER 1983: 107, Fig. 3); male unknown (India: Himachal Pradesh: Rotang Pass). ***I. himalajanus*** Schawaller, 1979
- Body length 5.5–6.0 mm. Pronotum extremely finely punctate, posterior corners rectangular (SCHAWALLER 2005: 116, Fig. 8); elytra with slightly narrower epipleural keel (SCHAWALLER 2005: 116, Fig. 8); tip of aedeagus widely triangular with dentate tip in dorsal view (SCHAWALLER 2005: 117, Fig. 15) (western Nepal: plateau north of Sishe Himal mts). ***I. jumlanus*** Schawaller, 2005
- 4 Body length 3.5–4.0 mm, body compact; pronotum with rounded posterior corners (SCHAWALLER 2005: 116, Figs. 7, 11), elytral interstriae without microsculpture. 5
- Body length 4.5–7.0 mm; body more flattened; pronotum with rectangular posterior corners (SCHAWALLER 1983: 107, Fig. 1; SCHAWALLER 2005: 116, Figs. 6, 9, 10), elytral interstriae with distinct microsculpture (only vestigial and irregular in *I. schmidti*). 6
- 5 Disc of pronotum with dense punctures (SCHAWALLER 2005: 116, Fig. 11); apex of aedeagus dorsally elevated in lateral view, suddenly constricted to a rectangular tip in dorsal view (SCHAWALLER 1991: 5, Figs. 6, 7) (northern India, Thailand, northern Vietnam, China: Yunnan and Fujian provinces). ***I. sikkimensis*** (Portevin, 1905)
- Disc of pronotum without punctures (SCHAWALLER 2005: 116, Fig. 7); apex of aedeagus straight in lateral view, regularly constricted to a triangular tip in dorsal view (SCHAWALLER 1991: 5, Figs. 4, 5) (Nepal, Myanmar, China: Sichuan province). ***I. indicus*** (Hlisnikovský, 1963)
- 6 Body length 5.8–7.0 mm; surface of pronotum glabrous or with distinct isodiametric microsculpture, sides with scattered fine punctures. Elytra with rows of dense and minute punctures (SCHAWALLER 2005: 116, Fig. 6), lateral margin of elytra distinctly serrate, with rounded denticles; tip of aedeagus very widely rounded in dorsal view (SCHAWALLER 2005: 117, Fig. 14) (Nepal, India: Sikkim). ***I. castaneicolor*** (Champion, 1923)
- Body length only 4.5–5.7 mm; surface of pronotum with regular, dense, large punctures or with only very superficial punctures. Elytra with large, sparsely arranged punctures in rows (SCHAWALLER 2005: 116, Fig. 10); if punctures in elytral rows densely arranged and minute (SCHAWALLER 1983: 107, Fig. 1; SCHAWALLER 2005: 116, Fig. 9), then lateral margin of elytra simple without serration or pronotum distinctly and densely punctate. 7
- 7 Body length 5.5–5.7 mm; surface of pronotum with distinct, large, dense punctures (SCHAWALLER 1983: 107, Fig. 1) and regular isodiametric microsculpture. Elytra with punctures in elytral rows small and densely arranged (SCHAWALLER 1983: 107, Fig. 1); elytral margin in anterior half with distinct serration (Japan: Honshu). ***I. striatipennis*** (Lewis, 1893)
- Body length 4.5–5.0 mm; surface of pronotum only with extremely fine punctation (SCHAWALLER 2005: 116, Figs. 9, 10). 8

- 8 Pronotum with regular isodiametric microsculpture; elytra with punctures in elytral rows small and densely arranged (SCHAWALLER 2005: 116, Fig. 9); elytral interstriae with distinct microsculpture; elytral margin entire, without serration; apex of aedeagus subrectangular (SCHAWALLER 2005: 117, Fig. 16) (eastern Nepal: Kangchenjunga Himal mts). *I. ruzickai* Schawaller, 2005
- Pronotum glabrous, without microsculpture; elytra with punctures in elytral rows larger, sparsely arranged (SCHAWALLER 2005: 116, Fig. 10); elytral interstriae with irregular, only vestigial microsculpture; elytral margin with distinct serration; apex of aedeagus more elongated and triangular (SCHAWALLER 2005: 117, Fig. 17) (central Nepal: Ganesh Himal mts). *I. schmidtii* Schawaller, 2005

subfamily Necrophilinae

Necrophilus rupinensis Schawaller, 1986

(Figs. 2, 16-24)

Necrophilus rupinensis Schawaller, 1986: 314.

Material examined. CHINA: SE TIBET, Zayu county, Salween–Irrawaddy divide and Taron river (Irraw), E branch valley, 28°27–35' N 098°00–15' E, 3400–4300 m, 19.–21.vi.1999, L. & R. Businský leg., 1 ♀ (JSPC). NEPAL: Langtang, Nubarna Dhang, 3830 m, 31.vii.1998, C. Berndt leg., W. Schawaller det., 1 ♀ (SMNS); Annapurna Himal mts, Annapurna Base Camp, 4100–4400 m, 13.vi.2000, J. Schmidt leg., W. Schawaller det., 1 ♂ 1 ♀ (SMNS).

Taxonomic note. Habitus of the only Chinese female specimen available (Fig. 2) fully corresponds with the specimens from Nepal. It is only slightly stouter; see also SCHAWALLER (2005: 116, Fig. 12). Tergite VIII in this female is more transverse (Fig. 16) than in the two females from Nepal (Figs. 17, 18). Ventricle VIII is posteriorly truncate but spiculum ventrale seems to be mutilated in the specimen from China (Fig. 19); ventrite VIII is posteriorly truncate or regularly rounded and spiculum ventrale is truncate or emarginated anteriorly in specimens from Nepal (Figs. 20, 21). Ventro-medial sclerite of female genitalia is largely unsclerotized medially and only weakly emarginated posteriorly in the Chinese specimen (Fig. 22) and only weakly unsclerotized medially and rounded posteriorly in specimens from Nepal (Figs. 23, 24). Further material from China, including male specimens, is needed to evaluate properly the taxonomical status of the Chinese population.

Distribution. So far known only from central Nepal (SCHAWALLER 1986, 1991, 1999, 2005). First record here reported from China (Fig. 27), which is an extension of the known distributional range by about 1200 km eastwards.

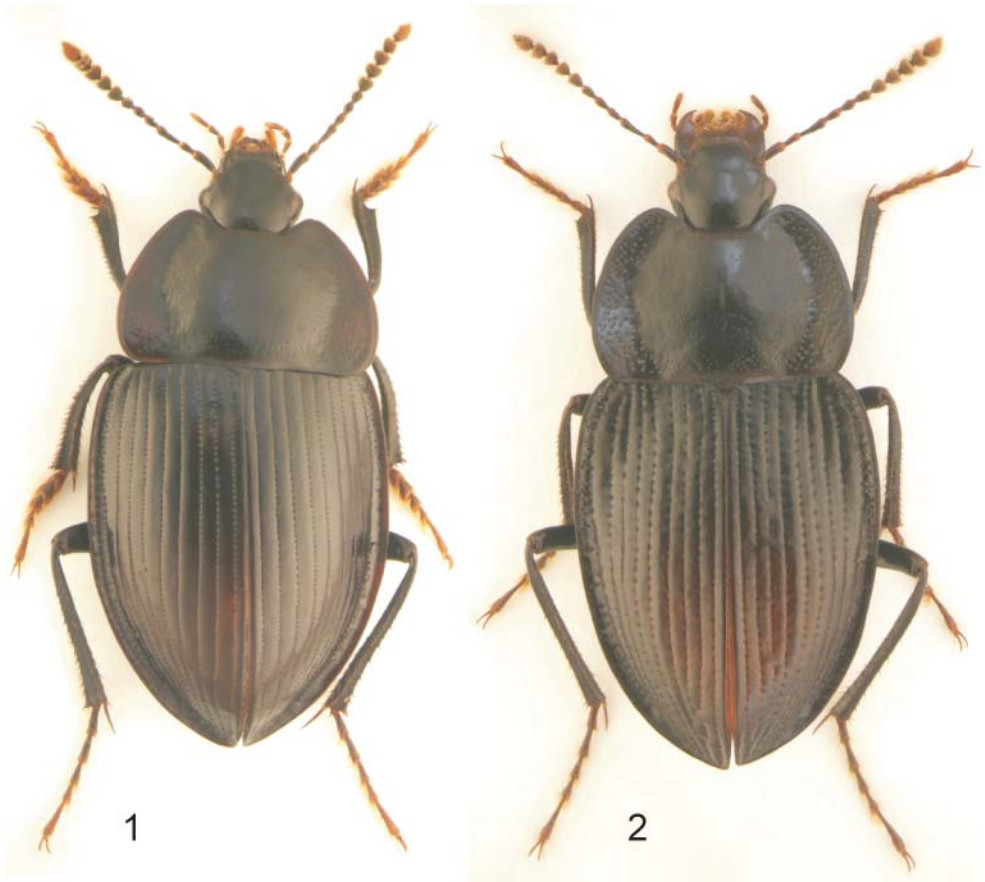
Necrophilus sichuanensis Nikolaev, 2003

(Figs. 1, 25, 26)

Necrophilus sichuanensis Nikolaev, 2003: 149.

Necrophilus chinensis Zhou, 2005 in (ZHOU et al., 2005: 63), **syn. nov.**

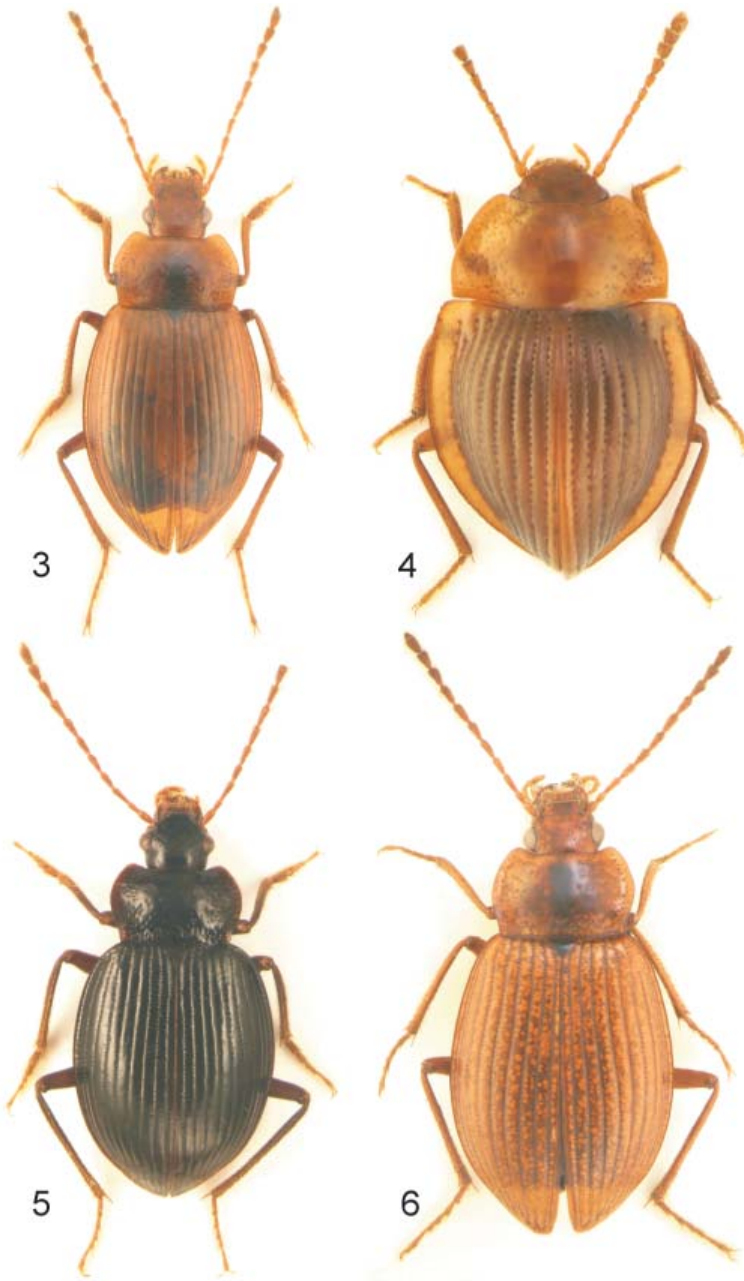
Type material examined. *Necrophilus sichuanensis*: HOLOTYPE ♂, PARATYPE ♀: '12.08.2002 S Sichuan / N of Eryizuxian, NW / of Mianning, 4000 m / I. Belousov I. Kabak [leg., collector's names in Cyrillic, p, red label] // Holotypus [or Paratypus] / *Necrophilus / sichunensis / Nikolajev 2003* [p, red label] // ZOOLOGICAL / INSTITUTE RAS / ST.PETERSBURG [p, light brown label]' (ZMAS).



Figs. 1–2. Habitus: 1 – *Necrophilus sichuanensis* Nikolaev, 2003 (♂, TBL 10 mm, West of Zhier; JRPC); 2 – *N. rupinensis* Schawaller, 1986 (♀, TBL 12 mm, Salween – Irrawaddy divide and Taron river; JSPC).

Necrophilus chinensis: PARATYPES: 1 ♂ 5 ♀♀, '[text in Chinese characters, p]' // PARATYPE / *Necrophilus* / *chinensis* / Det. Zhou, H-Z 2002 [p, red label with black frame] // *Necrophilus* / *chinensis* Zhou / [chinese characters] Zhou HZ [hw] // CHINA: Sichuan, N Jiulong county, / 3825m, streamside Salix scrub. / 11-14. vii. 2001 Pitfall trap J21 / Leg. Yu Xiaodong + Zhou Hongzhang [p] // Received iii.2005 from Zhou / direct pinned and without / paratype designation (see / *Coleopt. Bulletin* [sic!] 59(10:62-69). / remounted + labelled by J. Cooter [p]' (4 ♀♀ JCHC, 1 ♂ 1 ♀ JRPC).

Additional material examined. CHINA: SICHUAN PROVINCE: Kanding county and Jiulong county border, Mugang Ling mts, the central part, 29°13'–24' N 101°39'–45' E, 4100–4800 m, 23.-30.vi.2001, L. & R. Businský leg., 1 ♀ (JSPC); same data, 1 ♀ (JRPC); Jiulong-Zhou Shan mts, pass N of Jiulong [ca. 29°16' N 101°31' E], 4400–4500 m, 13.–21.vi.2004, R. Fabbri leg., 1 ♂ (JSPC); same locality, 3900 m, 3.-5.vii.2007, Heinz leg., 1 ♀ (JRPC); NNE Eryizuxiang, SW slope, 28°47.7' N 101°58.6' E, 3818 m, v.2004, M. Häckel & R. Sehnal leg., 3 ♂♂ 1 ♀ (JSPC); Sanya (= Eryizuxian), 28°47.7' N 101°58.6' E, 3800 m, 10.vi.2005, R. Sehnal & M. Trýzna leg., 2 ♂♂ (JSPC); Jinping Shan mts, W Mofanggou, 28°13' N 101°43' E, ca. 3600 m, 28.v.–4.vi.2005, R. Sehnal & M. Trýzna leg., pitfall traps, mixed mountain forest, 6 ♂♂ 6 ♀♀ (JRPC); same data, 23 ♂♂ 20 ♀♀ (JSPC); same data, 32 spec.



Figs. 3–6. Habitus. 3 – *Apteroloma jelineki* sp. nov. (♂ paratype, TBL 6.3 mm; JRPC); 4 – *Ipelates schuelkei* sp. nov. (♀ paratype, TBL 4.1 mm; JRPC); 5 – *Apteroloma belousovi* sp. nov. (♂ holotype, TBL 5.6 mm; ZMAS); 6 – *Apteroloma* sp. (♀, TBL 6.6 mm, 6 km S Xunyangba; JRPC).

(MTDC); W Zhier (= Zi'er), 28°20.886' N 101°28.361' E, 4241 m, 5.vi.2006, R. Sehnal & M. Trýzna leg., pitfall traps, small fragment of mixed mountain forest with dominant *Abies* in small valley, 18 ♂♂ 3 ♀♀ (JRPC); same data, 76 spec. (MTDC); same data, 15 ♂♂ 9 ♀♀ (JHC); same data, 7 ♂♂ 5 ♀♀ (JSPC); mts. 10 km NW Dongzi, 28°34' N 100°46' E, 4500 m, 21.–24.vi.2006, J. Kaláb leg., alpine meadows, screes, 1 ♂ 1 ♀ (JHC), same data, 1 ♂ 1 ♀ (JSPC).

Taxonomic note. *Necrophilus sichuanensis* was described from two localities in the southern Sichuan province (N Eryuzixian, 4000–4300 m; NW Lajajia, 4200–4300 m) (NIKOLAEV 2003). *Necrophilus chinensis* was described from several places in the Sichuan province, Jiulong county, 29°17' N 101°28' E, 3735–4300 m (ZHOU et al. 2005). Both descriptions were written almost simultaneously: the paper of NIKOLAEV (2003) was published on 7 April 2003; the paper of ZHOU et al. (2005) was received by the editor on 15 August 2003 and published on 19 April 2005.

Comparison of the holotype and one paratype of *N. sichuanensis* (from the environs of Eryuzixian) with a series of paratypes of *N. chinensis* showed no significant differences in external morphology. The only difference noted is a slightly different shape of the aedeagus, which is slightly more slender and elongated in the holotype of *N. sichuanensis* than in paratypes of *N. chinensis* and most of the additional specimens examined. In our opinion, this difference falls within an intraspecific variability. Consequently, *N. chinensis* is considered here as a junior subjective synonym of *N. sichuanensis*.

Complementary description. Populations at different altitudes show continual and overlapping differences in TBL with TBL decreasing with altitude (samples from two populations with large series of specimens: Mofanggou, 3600 m: ♂♂ 11.0–11.5 mm, ♀♀ 11.5–12.0 mm; W of Zhier, 4241 m: ♂♂ 9.5–10.5 mm, ♀♀ 10.5–11.5 mm).

Female: sternum VIII weakly emarginate (or rarely truncate) posteriorly, spiculum ventrale short, stout, truncate anteriorly (Figs. 26). Ventro-medial sclerite of female genitalia unsclerotized medio-anteriorly and rounded, irregularly unsclerotized posteriorly (Fig. 25).

Distribution. Endemic species, known only from China: Sichuan province (Fig. 27; NIKOLAEV 2003, ZHOU et al. 2005, this paper).

Key for species of *Necrophilus* Latreille, 1829 of China and adjacent countries

The key is modified from SCHAWALLER (1986).

- 1 Body length 15 mm; pronotum rounded posteriorly (SCHAWALLER 1978: 105, Fig. 1; 1986: 316, Fig. 11); elytra posteriorly elevated (SCHAWALLER 1978: 106, Fig. 9), without punctures on epipleural keel (Bhutan). *N. roderi* (Schawaller, 1978)
- Body length 9–12 mm; pronotum with straight posterior margin (Figs. 1, 2); elytra flat or only weakly vaulted posteriorly (Figs. 1, 2), with punctures on epipleural keel (Nepal, China). 2
- 2 Pronotum oval, sides distinctly elevated and with large punctures (Fig. 2); elytra with large punctures in striae, anterior part of elytra almost flat in posterior view (Fig. 2) (Nepal, China: Tibet). *N. rupinensis* Schawaller, 1986
- Pronotum subtrapezoid, sides less elevated and finely punctate (Fig. 1); elytra with fine punctures in striae, anterior part of elytra regularly vaulted in posterior view (Fig. 1) (China: Sichuan province). *N. sichuanensis* Nikolaev, 2003

Subfamily Pterolomatinae

Apteroloma belousovi sp. nov.

(Figs. 5, 7, 9, 11)

Type locality. China, Sichuan province, Lunan Shan mts, NE of Dechang.

Type material. Holotype: ♂, 'CH, S Sichuan, [province] N Lunan / Shan, NE of Dechang / W slope of Mt. '4282' [ca. 27°27' N, 102°15' E] / 2400-2800 m, 29.04.2001 / Belousov & Korolev I. [leg.] [p] // *Apteroloma davidis* / (Fairmaire) / Nikolaev det. [p]' (ZMAS). Paratypes: 4 ♂♂ 7 ♀♀, same data as holotype (2 ♂♂ 5 ♀♀ ZMAS, 1 ♂ 1 ♀ AFUA, 1 ♂ 1 ♀ JRPC).

Diagnostic description. Measurements of holotype: TBL 5.6 mm, PMW/PML 1.55, PMW/PBW 1.22, EL/EW 1.16, EW/PMW 1.54.

Body medium-sized, 5.4–5.6 mm (♂) and 5.9–6.0 mm (♀) in length. Dorsum in mature specimens dark brown; antennae, mouthparts and legs uniformly ferruginous (Fig. 5). Dorsal surface shiny, with fine transverse microsculpture. Pronotum and elytra with scattered short erect setae.

Pronotum widest in middle; anterior margin weakly emarginate; lateral margins distinctly bordered; weakly explanate; sides flat, only moderately raised and weakly sinuate posteriorly (Fig. 5); base wide, without impressions. Disc with scattered fine punctures, lateral and posterior areas densely punctate.

Elytra broadly oval. Each elytron with nine regular striae, stria 3 with ca. 65–68 medium-sized punctures; interstriae flat; lateral margin smooth, without serration; epipleural keel narrow. Metathoracic wings fully developed.

Male. Aedeagus evenly rounded with short, straight apex in lateral view (Fig. 7); sides not broadened sub-apically, regularly tapering to slender tip in dorsal view (Fig. 9).

Female. Ventrite VIII truncate posteriorly, spiculum ventrale very narrow, truncate anterior margin and distinctly broadened latero-apical margin (Fig. 11). Ovipositor with transverse valvifer without setae; triangular, heavily sclerotized coxite bearing numerous setae; stylus modified into strongly curved, apically glabrous scraper (as in RŮŽIČKA et al. 2004: 117, Fig. 20).

Differential diagnosis. The new species is very similar in habitus (i.e., oval elytra and dark brown dorsum with paler, unicoloured appendages) to *A. davidis* (Fairmaire, 1891), *A. jinfo* Růžička, Schneider & Háva, 2004 and *A. qinlingense* Rougemont, 2001 (Fig. 5) but differs from them by the combination of the following characters: sides of pronotum only weakly sinuate posteriorly (as in *A. davidis* and *A. jinfo*; distinctly sinuate in *A. qinlingense*); elytra with medium-sized strial punctures (as in *A. davidis*; distinctly larger punctures in *A. jinfo* and *A. qinlingense*) and elytral interstriae anteriorly flat (as in *A. davidis* and *A. qinlingense*; distinctly raised anteriorly in *A. jinfo*). All four species can be reliably identified using the features of male genitalia: aedeagus slender with a short apex, regularly tapering in dorsal view in *A. belousovi* sp. nov. (Figs. 7, 9); with a short apex, sub-apically broadened in dorsal view in *A. davidis* (RŮŽIČKA et al. 2004: 117, Figs. 2, 6); with an elongate apex and sinuate sides in *A. jinfo* (RŮŽIČKA et al. 2004: 117, Figs. 3, 7); and slender with an elongate apex, regularly tapering in dorsal view in *A. qinlingense* (RŮŽIČKA et al. 2004: 117, Figs. 1, 5). Female of *A. belousovi* sp. nov. differs in the shape of ventrite VIII, which is truncate posteriorly (Fig. 11), as in *A. jinfo*, but rounded posteriorly in *A. davidis* (RŮŽIČKA et al. 2004: 117, Fig. 9) and narrowly emarginate posteriorly in *A. qinlingense* (Fig. 13), and in the spiculum ventrale,

Table 1. Morphometric measurements of *Apteroloma belousovi* sp. nov. and *A. jelineki* sp. nov., given for each character as ‘minimum–maximum (mean \pm standard deviation)’; TBL = total body length, PMW = maximum width of pronotum, PBW = basal width of pronotum, PML = medial length of pronotum, EW = combined maximum width of elytra, EL = length of elytra (measured from caudal tip of scutellum to elytral apex), n = number of specimens.

Species / character	TBL (mm)	PMW / PML	PMW / PBW	EL / EW	EW / PMW
<i>A. belousovi</i> sp. nov. male ($n = 4$)	5.4–5.6 (5.5 \pm 0.1)	1.52–1.58 (1.56 \pm 0.03)	1.22 (1.22 \pm 0.00)	1.16–1.23 (1.20 \pm 0.03)	1.53–1.54 (1.54 \pm 0.01)
<i>A. belousovi</i> sp. nov. female ($n = 6$)	5.9–6.0 (6.0 \pm 0.1)	1.57–1.61 (1.60 \pm 0.02)	1.17–1.22 (1.20 \pm 0.02)	1.13–1.24 (1.18 \pm 0.04)	1.53–1.59 (1.57 \pm 0.02)
<i>A. jelineki</i> sp. nov. male ($n = 6$)	5.6–6.3 (6.0 \pm 0.3)	1.67–1.74 (1.71 \pm 0.03)	1.07–1.12 (1.10 \pm 0.02)	1.14–1.29 (1.22 \pm 0.06)	1.43–1.50 (1.46 \pm 0.03)
<i>A. jelineki</i> sp. nov. female ($n = 5$)	6.2–6.5 (6.4 \pm 0.1)	1.71–1.78 (1.74 \pm 0.03)	1.10–1.12 (1.11 \pm 0.01)	1.18–1.25 (1.21 \pm 0.03)	1.43–1.49 (1.46 \pm 0.03)

which is distinctly broadened latero-apically (Fig. 11), as in *A. davidis* and *A. qinlingense*, but narrower and not broadened latero-apically in *A. jinjo* (Růžička et al. 2004: 117, Fig. 10).

Etymology. Patronymic, named in honour of Igor Belousov (St. Petersburg, Russia), specialist in Carabidae and collector of the type series.

Bionomics. The type series was collected in gravel and small stones on banks of a rather large river (I. Belousov, pers. comm.).

Distribution. So far known only from the type locality in China: Sichuan province, situated close to the border with Yunnan province (Fig. 27).

Apteroloma jelineki sp. nov.

(Figs. 3, 8, 10, 12)

Type locality. China, Yunnan province, Gaoligong Shan mts, pass 24 km NW Liuku or 7 km E Pianma.

Type material. Holotype: ♂, ‘CHINA: Yunnan [province] (CH07-26), / Nujiang Lisu Aut.[onomous] Pref.[ecture] / Gaoligong Shan [mts], pass 24 km NW / Liuku or 7 km E Pianma, / 25°58'22"N, 98°41'00"E, 3150 / m, bamboo with shrubs, litter / sifted, 9.VI.2007, leg. A. Pütz [leg.] [p]’ (APEG, will be deposited in ZMHB). Paratypes: 5 ♂♂ 5 ♀♀, same data as holotype (3 ♂♂ 3 ♀♀ APEG, 1 ♂ 1 ♀ JRPC, 1 ♂ 1 ♀ SMNS).

Diagnostic description. Measurements of the male holotype: TBL 6.1 mm, PMW/PML 1.71, PMW/PBW 1.12, EL/EW 1.28, EW/PMW 1.43.

Body large in size, 5.6–6.3 mm (♂) and 6.2–6.5 mm (♀) long. Dorsum in mature specimens light brown, resembling teneral specimens of *A. davidis*, pronotal disc with large, dark brown medial spot; antennae, mouthparts and legs uniformly light brown (Fig. 3). Dorsal surface very shiny, with fine transverse microsculpture; disc of pronotum almost glabrous, only with very fine and superficial microsculpture. Pronotum and elytra with scattered short erect setae.

Pronotum widest in middle; anterior margin weakly emarginate; lateral margins distinctly bordered, very weakly explanate; sides weakly raised and very weakly sinuate posteriorly (Fig. 3); base very wide, without impressions. Disc with scattered punctures, lateral and posterior areas with strong and dense punctures.

Elytra broadly oval. Each elytron with nine regular striae, stria 3 with ca. 65–68 small punctures; interstriae flat; elytron with narrow epipleural keel; laterally smooth, without serration. Hind wings fully developed.

Male. Aedeagus evenly rounded with short, dorsally elevated apex in lateral view (Fig. 8); sides before apex distinctly broadened and heavily sinuate, apex widely rounded in dorsal view (Fig. 10).

Female. Ventricle VIII widely, regularly rounded posteriorly, spiculum ventrale wide, truncate anteriorly (Fig. 12). Ovipositor with wide and short valvifer with only 2–3 ventromedial setae; triangular, heavily sclerotized coxite bearing numerous setae; stylus modified into strongly curved, apically glabrous, short scraper (as in RŮŽIČKA et al. 2004: 117, Fig. 20).

Differential diagnosis. Large species, habitually similar to *A. schawalleri* Růžička, Schneider & Háva, 2004. Both species also share the general shape of the aedeagus, which is distinctly broadened before apex and has heavily sinuate sides in dorsal view, and the wide and robust shape of spiculum ventrale in females. Both species clearly differ by the combination of the following characters: dorsum light brown (with only disc of pronotum darker) and with scattered short erect setae in *A. jelineki* sp. nov. (black and with scattered long erect setation in *A. schawalleri*); antennae uniformly light brown in *A. jelineki* sp. nov. (bicoloured, with antennomeres 1, 2, 10 and 11 ferruginous, and the remaining ones black in *A. schawalleri*); pronotum with almost glabrous disc posteriorly very weakly sinuate sides and very wide base in *A. jelineki* sp. nov. (disc with distinct transverse microsculpture, distinctly sinuate sides and narrow base in *A. schawalleri*). Both species can be reliably identified using features of the male genitalia: aedeagus with a dorsally elevated apical part in lateral view and widely rounded apex in dorsal view in *A. jelineki* sp. nov. (Figs. 8, 10) and with a straight apical part in lateral view and narrow apex in dorsal view in *A. schawalleri* (RŮŽIČKA et al. 2004: 117, Figs. 4, 8). Female of *A. jelineki* sp. nov. differs in the shape of ventrite VIII, which is widely and regularly rounded posteriorly, and truncate anterior margin of spiculum ventrale (Fig. 12). In *A. schawalleri* ventrite VIII is narrower posteriorly and the anterior margin of spiculum ventrale is widely though weakly emarginate (RŮŽIČKA et al. 2004: 117, Fig. 11).

Etymology. Patronymic, named in honour of Josef Jelínek (Prague, Czech Republic), specialist in Nitidulidae, and a very kind person with a truly encyclopedic knowledge, which he is always ready to share with others.

Bionomics. Type series was individually collected under small stones in a sandy habitat almost without vegetation on the eastern slope of a pass.

Distribution. So far known only from the type locality in China: Yunnan province, situated close to the border with Myanmar (Fig. 27).

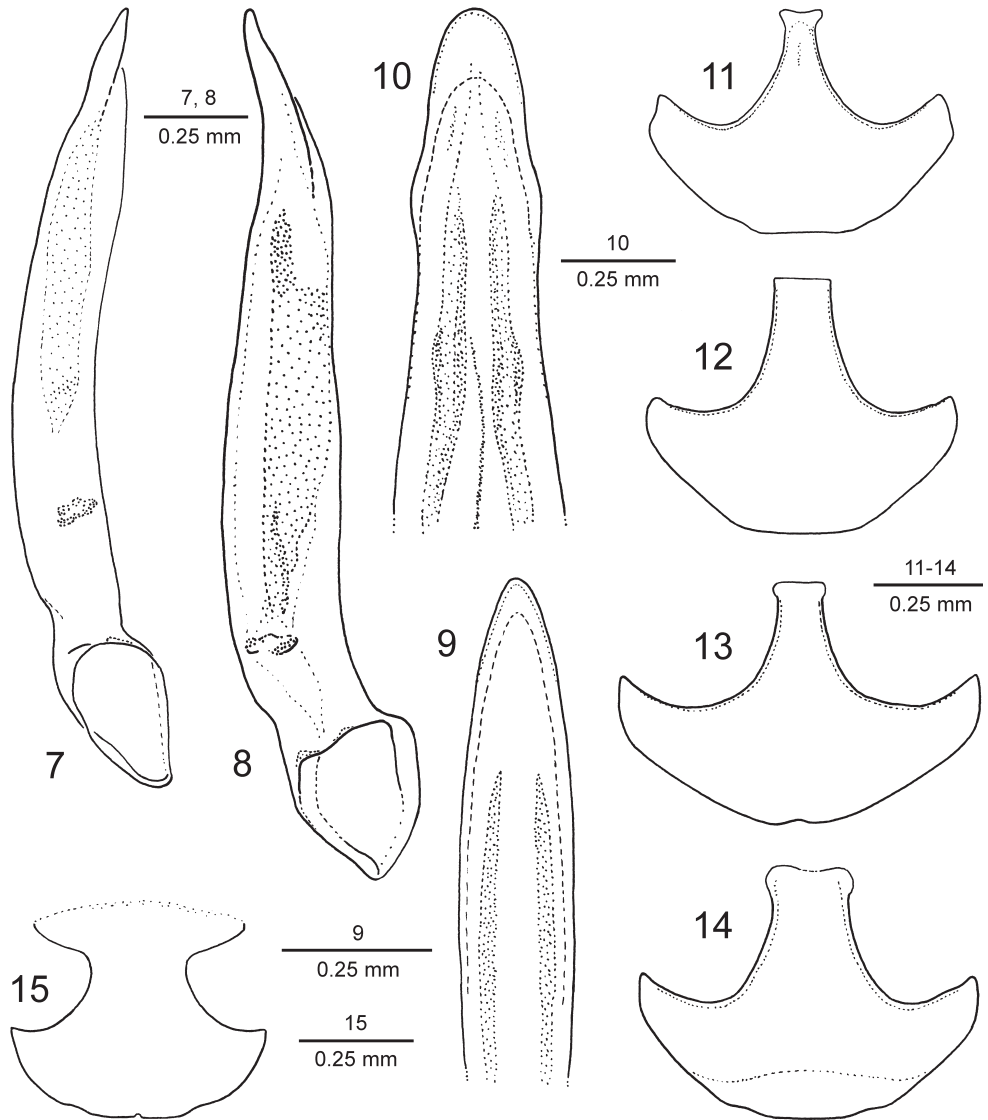
Apteroloma potanini (Semenov, 1893)

Pteroloma potanini Semenov, 1893: 338.

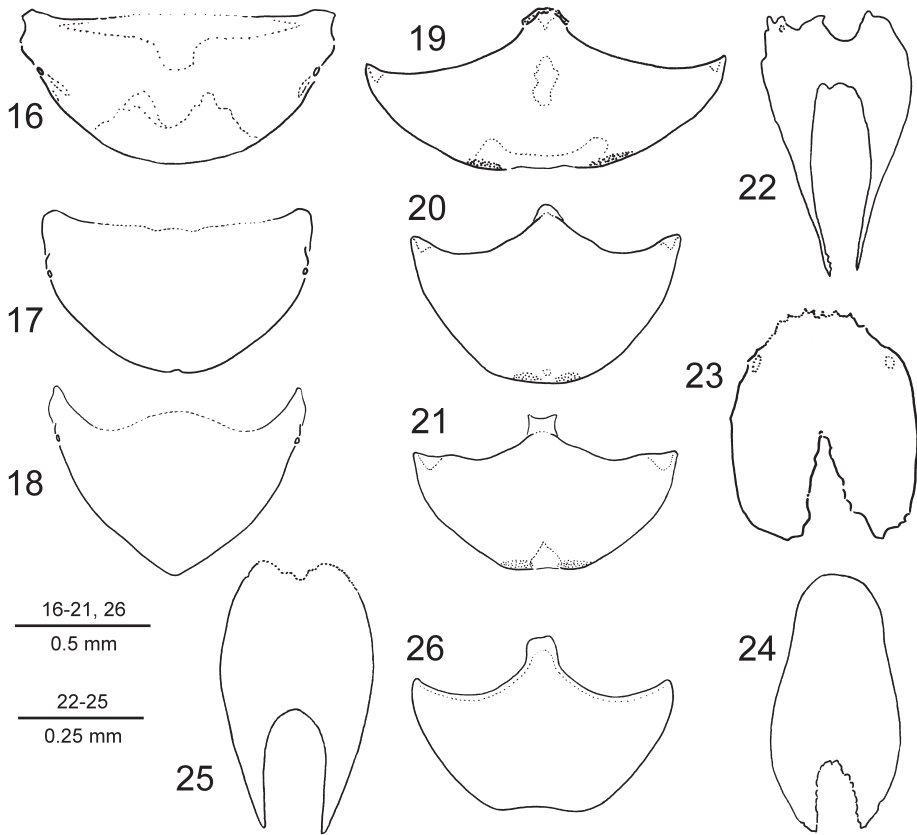
Apteroloma potanini: SEMENOV-TIAN-SHANSKIJ (1932) (new combination).

Apteroloma potanini: RŮŽIČKA et al. (2004) (redescription, restricted status)

Material examined. CHINA: GANSU PROVINCE: Lazikou valley, 34°09.9–10.1' N, 103°48.2–51.9' E, 2120–2510 m, 28.vi.2005, J. Hájek, D. Král & J. Růžička leg., individually under a large wet log, close to brook, 1 ♀ (JRPC). SHAANXI PROVINCE: Qingling Shan mts, 6 km S Xunyangba, ca. 33°28' N, 108°30' E, 18.–20.v.2005, O. Nakládal leg., on the first mountain ridge S of Xunyangba, wet close valley near the stream, secondary mixed forest, unbaited pitfall traps, 1 ♂ 1 ♀ (JRPC).



Figs. 7–15. 7, 8 – aedeagus, lateral view; 9, 10 – apex of aedeagus, dorsal view; 11–15 – female ventrite VIII, ventral view. 7, 9 – *Aperoloma belousovi* sp. nov. (♂ holotype; ZMAS); 8 – *A. jelineki* sp. nov. (♂ paratype; JRPC); 10 – *A. jelineki* sp. nov. (♂ holotype; APEG); 11 – *A. belousovi* sp. nov. (♀ paratype; JRPC); 12 – *A. jelineki* sp. nov. (♀ paratype; JRPC); 13 – *A. qinlingense* Rougemont, 2001 (♀, 6 km S Xunyangba; JRPC); 14 – *Apteroloma* sp. (♀, 6 km S Xunyangba; JRPC); 15 – *Ipelates schuelkei* sp. nov. (♀ paratype; JRPC).



Figs. 16–26. 16–18 – female tergum VIII, dorsal view; 19–21, 26 – female ventrite VIII, ventral view; 22–25 – female ventro-medial sclerite, ventral view. 16, 19, 22 – *Necrophilus rupinensis* Schawaller, 1986 (♀, Salween – Irrawaddy divide and Taron river; JSPC); 17, 20, 23 – *N. rupinensis* (♀, Annapurna Himal mts; SMNS); 18, 21, 24 – *N. rupinensis* (♀, Langtang; SMNS); 25, 26 – *Necrophilus sichuanensis* Nikolaev, 2003 (♀, West of Zhier; JRPC).

Distribution. *Apteroloma potanini* is currently known from seven localities scattered through the Chinese provinces of Sichuan (RŮŽIČKA & SCHNEIDER 1995), Gansu (SEMENOV 1893, SCHAWALLER 1999), Shaanxi, Hubei and Hebei (RŮŽIČKA et al. 2004).

Apteroloma qinlingense Rougemont, 2001

(Fig. 13)

Apteroloma qinlingense Rougemont, 2001: 351.

Apteroloma qinlingense: RŮŽIČKA et al. (2004) (redescription).

Material examined. CHINA: SHAANXI PROVINCE: Qingling Shan mts, 6 km S Xunyangba, ca. 33°28' N, 108°30' E, 18.–20.v.2005, O. Nakládal leg., on the first mountain ridge S of Xunyangba, wet close valley near the stream, secondary mixed forest, unbaited pitfall traps, 1 ♂ 3 ♀♀ (JRPC).

Complementary description. The male was recently redescribed by RŮŽIČKA et al. (2004). Female. Posterior margin of ventrite VIII narrowly emarginate, spiculum ventrale narrow, with truncate anterior margin and weakly broadened latero-apical margin (Fig. 13). Ovipositor with transverse valvifer without setae; triangular, heavily sclerotized coxite bearing numerous setae; stylus modified into strongly curved, apically glabrous scraper (similar to *A. belousovi* sp. nov., *A. davidis* (Fairmaire, 1891), *A. jelineki* sp. nov., *A. jinfo* Růžička, Schneider & Háva, 2004 [see RŮŽIČKA et al. 2004: 119, Fig. 20] and *A. schawalleri* Růžička, Schneider & Háva, 2004).

Distribution. *Apteroloma qinlingense* is an endemic species, presently known only from three localities in the Qinling Shan mts in the Shaanxi province (ROUGEMONT 2001, RŮŽIČKA et al. 2004).

Apteroloma sp.

(Figs. 6, 14)

Material examined. CHINA: SHAANXI PROVINCE: Qingling Shan mts, 6 km S Xunyangba, ca. 33°28' N, 108°30' E, 18.–20.v.2005, O. Nakládal leg., on the first mountain ridge S of Xunyangba, wet close valley near the stream, secondary mixed forest, unbaited pitfall traps, 1 ♀ (JRPC).

Note. The single female specimen is subteneral and although it probably represents an undescribed species, it is not formally named here until a conspecific male becomes available. However, we provide here a brief description to facilitate its association with other specimens in the future.

Diagnostic description. Measurements: TBL 6.6 mm, PMW/PML 1.64, PMW/PBW 1.14, EL/EW 1.22, EW/PMW 1.55.

Body large in size, robust and only weakly vaulted (Fig. 6), habitually similar to *A. turkestanicum* (Semenov, 1893). Dorsum light brown, pronotal disc with narrow, dark brown medial spot; antennae, mouthparts and legs uniformly light brown (Fig. 6). Dorsal surface lustrous, head and pronotum without microsculpture, elytra with fine, slightly transverse microsculpture. Pronotum and elytra with scattered short erect setae.

Pronotum widest at half of length; anterior margin distinctly emarginate; lateral margin finely bordered, weakly explanate; sides moderately raised and weakly sinuate posteriorly (Fig. 6); base wide, without impressions. Disc impunctate, lateral and posterior areas with scarce strong punctures.

Elytra broadly oval, apical part elongate. Each elytron with nine regular striae, stria 3 with ca. 58 medium-sized punctures; interstriae flat; elytron with narrow epipleural keel; lateral margin smooth, without serration. Hind wings fully developed.

Male. Unknown.

Female. Posterior margin of ventrite VIII regularly rounded with slight lateral sinuosity, spiculum ventrale wide, conically tapering toward weakly emarginate anterior margin, distinctly broadened latero-apical margin (Fig. 14). Ovipositor with transverse, asetose valvifer; triangular, heavily sclerotized coxite bearing numerous setae; stylus modified into strongly curved, apically glabrous scrapers (similar to *A. belousovi* sp. nov., *A. davidis*, *A. jelineki* sp. nov., *A. jinfo* [see RŮŽIČKA et al. 2004: 119, Fig. 20], *A. qinlingense* and *A. schawalleri*).

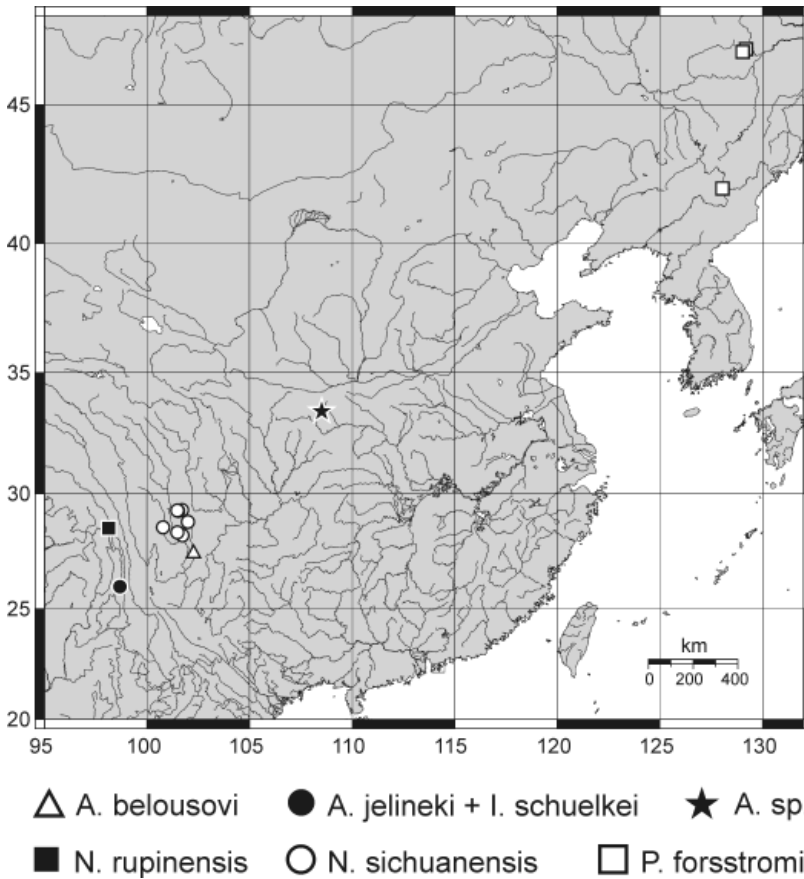


Fig. 27. Known distribution of *Apteroloma belousovi* sp. nov., *A. jelineki* sp. nov., *A. sp.*, *Ipelates schuelkei* sp. nov., *Necrophilus rupinensis* Schawaller, 1986, *N. sichuanensis* Nikolaev, 2003 and *Pteroloma forstromii* (Gyllenhal, 1810) in China.

Distribution. This presumably new species of *Apteroloma* is presently known only from a single locality in the Qinling Shan mts in the Shaanxi province. It was collected together with *A. potanini* and *A. qinlingense*.

Key for species of *Apteroloma* Hatch, 1927 of China

The key is modified from RŮŽIČKA et al. (2004) to accommodate the new species described here.

- 1 Small species (body length 3.9–5.1 mm) with compact body outline (RŮŽIČKA et al. 2004: 120, Figs. 26, 27); dorsum dull, with isodiametric microsculpture; pronotum widest at basal third, anterior margin distinctly emarginate, sides raised; elytra with wide epipleural

- keel; female ventrite VIII emarginate posteriorly (RŮŽIČKA et al. 2004: 119, Figs. 18–19). Ovipositor unmodified, with narrow valvifer bearing large seta, elongate coxite and setose digitiform stylus (RŮŽIČKA et al. 2004: 119, Fig. 21). 2
- Medium to large species (body length 5.4–7.6 mm) with constricted base of pronotum (Figs. 3, 5, 6; RŮŽIČKA et al. 2004: 120, Figs. 22–25); dorsum shiny, with fine transverse microsculpture; pronotum widest in middle, only weakly emarginate anteriorly, with flat sides; elytra with narrow epipleural keel; female ventrite VIII regularly rounded or truncate posteriorly (Figs. 11–13; RŮŽIČKA et al. 2004: 117, Figs. 9–11). Ovipositor with transverse valvifer without setae; triangular, heavily sclerotized coxite bearing numerous setae; stylus modified into strongly curved, apically glabrous scrapers (RŮŽIČKA et al. 2004: 119, Fig. 20). 3
- 2 Sides of pronotum less distinctly raised (RŮŽIČKA et al. 2004: 120, Fig. 26); aedeagus with more robust and obtuse apex, only finely granulate laterally (RŮŽIČKA et al. 2004: 119, Figs. 12, 14, 16); female ventrite VIII with shorter and more transverse spiculum ventrale (RŮŽIČKA et al. 2004: 119, Fig. 18) (Qinghai province to Beijing municipality; Korea). ..
..... *A. kozlovi* Semenov-Tian-Shanskij & Znojko, 1932
- Sides of pronotum more distinctly raised (RŮŽIČKA et al. 2004: 120, Fig. 27); aedeagus distinctly constricted sub-apically, with more slender apex, coarsely granulate laterally (RŮŽIČKA et al. 2004: 119, Figs. 13, 15, 17); female ventrite VIII with robust, sub-quadrate spiculum ventrale (RŮŽIČKA et al. 2004: 119, Fig. 19) (Sichuan to Hebei province).
..... *A. potanini* (Semenov, 1893)
- 3 Body black, elytra elongate (1.24–1.41 times as long as wide), pronotum with narrow base (RŮŽIČKA et al. 2004: 120, Fig. 25); antenna bicoloured with antennomeres 1, 2, 10 and 11 ferruginous, the rest black; pronotum and elytra with scattered long erect setae; apex of aedeagus narrow with distinctly sinuate sides (RŮŽIČKA et al. 2004: 117, Fig. 4); female ventrite VIII with wide, emarginate spiculum ventrale (RŮŽIČKA et al. 2004: 117, Fig. 11) (Sichuan province: Emei Shan mts). .. *A. schawalleri* Růžička, Schneider & Háva, 2004
- Body light to dark brown, elytra broadly oval (1.07–1.29 times as long as wide), pronotum with wide base (Figs. 3, 5; RŮŽIČKA et al. 2004: 120, Figs. 22–24); antenna uniformly ferruginous; pronotum and elytra with scattered short erect setae; apex of aedeagus of different shape (Fig. 10; RŮŽIČKA et al. 2004: 117, Figs. 1–3); female ventrite VIII with narrow spiculum ventrale (Figs. 13; RŮŽIČKA et al. 2004: 117, Figs. 9, 10). 4
- 4 Body in mature specimens light brown with dark brown median spot on pronotum (Fig. 3); aedeagus short with dorsally elevated apex in lateral view (Fig. 8), sides before apex distinctly broadened and heavily sinuate, apex widely rounded in dorsal view (Fig. 10); female ventrite VIII regularly rounded posteriorly, with wide and truncate spiculum ventrale (Fig. 12) (Yunnan province: Gaoligong Shan mts). *A. jelineki* sp. nov.
- Body in mature specimens dark brown; aedeagus of different shape but always with narrow apex in dorsal view (Fig. 9; RŮŽIČKA et al. 2004: 117, Figs. 1–3); female ventrite VIII with narrow spiculum ventrale (Fig. 11; RŮŽIČKA et al. 2004: 117, Figs. 9, 10) (Sichuan or Shaanxi provinces). 5
- 5 Large species (body length 6.9–7.4 mm); aedeagus large with triangular, sub-sinuate apex in dorsal view (RŮŽIČKA et al. 2004: 117, Figs. 3, 7); posterior margin of female ventrite VIII

- truncate, spiculum ventrale narrow (RŮŽIČKA et al. 2004: 117, Fig. 10) (Sichuan province: Jinfo Shan mts). *A. jinfo* Růžička, Schneider & Háva, 2004
- Small species (body length 5.4–6.8 mm); aedeagus short with subapically broadened or slender tip (Fig. 7, 9; RŮŽIČKA et al. 2004: 117, Figs. 1, 2, 5, 6); female ventrite VIII of different shape: posterior margin truncate, spiculum ventral very narrow, broadened latero-apically (Fig. 11), or posterior margin regularly rounded (RŮŽIČKA et al. 2004: 117, Fig. 9) or narrowly emarginate (Fig. 13). 6
- 6 Pronotum with sides distinctly sinuate posteriorly (RŮŽIČKA et al. 2004: 120, Fig. 24); elytral striae with very large punctures; aedeagus with elongate, slender, dorsally elevated apex in lateral view (RŮŽIČKA et al. 2004: 117, Fig. 5), regularly tapering to slender tip in dorsal view (RŮŽIČKA et al. 2004: 117, Fig. 1); female ventrite VIII narrowly emarginate posteriorly (Fig. 13) (Shaanxi province: Qingling Shan mts).
..... *A. qinlingense* Rougemont, 2001
- Pronotum with sides weakly sinuate posteriorly (Fig. 5; RŮŽIČKA et al. 2004: 120, Fig. 22); elytral striae with medium-sized punctures; aedeagus with short, straight apex in lateral view (Fig. 7; RŮŽIČKA et al. 2004: 117, Fig. 6); female ventrite VIII regularly rounded or truncate posteriorly (Fig. 11; RŮŽIČKA et al. 2004: 117, Fig. 9) (Sichuan province). 7
- 7 Body length 5.6–6.8 mm; aedeagus broadened before narrow apex in dorsal view (RŮŽIČKA et al. 2004: 117, Fig. 2); posterior margin of female ventrite VIII regularly rounded, spiculum ventrale broader (RŮŽIČKA et al. 2004: 117, Fig. 9) (Sichuan province: Daxue Shan mts). *A. davidis* (Fairmaire, 1891)
- Body length 5.4–6.0 mm; aedeagus narrow, not broadened sub-apically, regularly tapering to slender tip in dorsal view (Fig. 9); posterior margin of female ventrite VIII truncate with very narrow spiculum ventrale (Fig. 11) (Sichuan province: Lunan Shan mts).
..... *A. belousovi* sp. nov.

Pteroloma forststromii (Gyllenhal, 1810)

Harpalus Forsströmii Gyllenhal, 1810: 111.

Pteroloma forststromii: NEWTON (1997) (catalogue).

Material examined. CHINA: JILIN PROVINCE: Chang Bai Shan, 42°01.733' N, 128°03.100' E, ca. 2195 m, 7.vi.2004, J. Cooter leg., under stones, near crater lake, 1 ♂ (JCHC). HEILONGJIANG PROVINCE: Qing Yuan ca. 29 km S Lang Xian, 46°47.470' N, 129°03.82' E, ca. 600–700 m, 25.–29.v.2004, flight interception trap, 1 ♂ (aedeagus missing) (JCHC); same locality, but 46°47.002' N, 129°08.23' E, ca. 700 m, 25.–28.v.2004, J. Cooter leg., 1 ♀ (JCHC); same locality, but 46°47.002' N, 129°04.349' E, ca. 600 m, 26.v.2004, J. Cooter leg., streamside litter, 1 ♀ (JRPC).

Distribution. *Pteroloma forststromii* is a widely distributed Palaearctic species, known also from adjacent areas in the Far East of Russia and North Korea (LAFER 2002, RŮŽIČKA & SCHNEIDER 2003). Specimens from the Heilongjiang province are only tentatively identified, as this species can be reliably separated from related *P. sibiricum* Székessy, 1935 only based on the shape of male genitalia (LAFER 2002). First record from China (Fig. 27).

Key for species of *Pteroloma* Gyllenhal, 1827 of China and adjacent countries

The key is modified from LAFER (2002).

- 1 Elytra almost round (1.2 times as long as wide), with very wide epipleural keel (RŮŽIČKA & SCHNEIDER 1995: 113, Fig. 1) (Russia: Primorye region: south of Sikhote Alin mts). ...
..... *P. plutenkoi* (Růžička & Schneider, 1995)
- Elytra more oval (1.35–1.50 times as long as wide), with narrow epipleural keel (LAFER 2002: 52, Fig. 1). 2
- 2 Body yellowish (becoming light brown in dead specimens); antenna distinctly bicolorous, with antennomeres 1, 2 and 11 yellow and the others black (LAFER 2002: 52, Fig. 1); legs bicolorous, yellow with black tibia and apical part of femora; lateral margin of elytra serrate to three fourths of its length; aedeagus regularly rounded toward apex in lateral view, paramera short, not exceeding half of the length of median lobe (LAFER 2002: 53, Fig. 2C); apex of aedeagus wide, quadrate, symmetrical, very slightly constricted subapically, without median translucent ‘window’ in dorsal view (LAFER 2002: 53, Fig. 2D) (Russia: south-western Primorye region). *P. nigromontanum* Lafer, 2002
- Body dark brown to black in mature specimens (pale brown in teneral adults); antenna and legs uniformly concolorous; lateral margin of elytra serrate only to 1/3 of its length; aedeagus different, but paramera longer than half of the median lobe (LAFER 2002: 53, Figs. 2A,E). 3
- 3 Apex of aedeagus very narrow, forming distinctly asymmetrical spike in dorsal view (LAFER 2002: 53, Fig. 2B), straight in lateral view (LAFER 2002: 53, Fig. 2A) (Russia: Irkutsk region to Sakhalin, Mongolia, Japan: Hokkaido). *P. sibiricum* Székessy, 1935
- Apex of aedeagus wider, subquadrate, slightly asymmetrical, distinctly constricted subapically, with medial translucent ‘window’ in dorsal view (LAFER 2002: 53, Fig. 2F), sinuate in lateral view (LAFER 2002: 53, Fig. 2E) (forest zone across the Palearctic Region).
..... *P. forstromii* (Gyllenhal, 1890)

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References

- ARNETT R. H. jr., SAMUELSON G. A. & NISHIDA G. M. 1993: *The Insect and Spider Collections of the World, 2. edition*. Sandhill Crane Press, Gainesville, vi + 309 pp.
- LAFER G. Sh. 2002: A review of species of the genus *Pteroloma* Gyllenhal (Coleoptera: Pterolominae) from the Russian Far East with the description of a new species from the south of Primorsky Krai. *Baltic Journal of Coleopterology* **2**: 49–61.
- NEWTON A. F., Jr. 1997: Review of Agyrtidae (Coleoptera), with a new genus and species from New Zealand. *Annales Zoologici (Warszawa)* **47**: 111–156.
- NIKOLAEV G. V. 2003: A new *Necrophilus* Latr. species (Coleoptera, Agyrtidae) from Asia. *Tethys Entomological Research* **8**: 149–150 (in Russian, English summary).
- NISHIKAWA M. 2002: *Pteroloma kurosawai*, a new subalpine agyrtid beetle (Coleoptera, Agyrtidae) from Central Japan, with a key to the Asian species. *Elytra* (Tokyo) **30**: 101–107.
- PORTEVIN G. 1905: Troisième note sur les Silphides du Muséum. *Bulletin du Muséum National d'Histoire Naturelle de Paris* **11**: 418–424.
- PORTEVIN G. 1914: Révision des Silphides, Liodides et Clambides du Japon. *Annales de la Société Entomologique de Belgique* **58**: 212–236.
- ROUGEMONT G. M. DE 2001: Description of a new species of *Apteroloma* from China (Coleoptera, Agyrtidae). *Revue Suisse de Zoologie* **108**: 351–353.
- RŮŽIČKA J. 1994: Notes on *Rybinskiella* (Coleoptera: Leiodidae: Cholevinae) with description of a new species from Kazakhstan. *Acta Universitatis Carolinae, Biologica* **38**: 3–11.
- RŮŽIČKA J. 2004: Family Agyrtidae C. G. Thomson, 1859. Pp. 131–133. In: LÖBL I. & SMETANA A. (eds.): *Catalogue of Palaearctic Coleoptera. Volume 2. Hydrophiloidea – Histeroidea – Staphylinoidea*. Apollo Books, Stenstrup, 942 pp.
- RŮŽIČKA J. & SCHNEIDER J. 1995: A new species of *Apteroloma* from the Far East, and new faunistic records on Palaearctic Agyrtidae (Coleoptera). *Entomological Problems* **26**: 111–115.
- RŮŽIČKA J. & SCHNEIDER J. 2003: Interesting distributional records of Agyrtidae and Silphidae (Coleoptera) from the Palaearctic and Oriental region. *Klapalekiana* **39**: 307–311.
- RŮŽIČKA J., SCHNEIDER J. & HÁVA J. 2004: A revision of *Apteroloma* (Coleoptera: Agyrtidae) from China. *Acta Societatis Zoologicae Bohemicae* **68**: 113–126.
- SCHAWALLER W. 1978: Eine neue Gattung und Art, *Pseudosilpha* n.gen. roderi n.sp., aus dem Bhutan-Himalaya. *Entomologica Basiliensia* **3**: 103–108.
- SCHAWALLER W. 1983: Die Arten der Gattung *Ipelates* (sensu lato) (Coleoptera, Silphidae, Agyrtinae). *Revue Suisse de Zoologie* **90**: 101–110.
- SCHAWALLER W. 1986: Die Gattung *Necrophilus* Latreille 1829 im Himalaya (Insecta: Coleoptera: Agyrtidae). *Senckenbergiana Biologica* **66**: 311–319.
- SCHAWALLER W. 1991: Agyrtidae (Coleoptera) aus dem Himalaya und den angrenzenden Gebieten. *Stuttgarter Beiträge zur Naturkunde, Serie A (Biologie)* **468**: 1–22.
- SCHAWALLER W. 1999: A new species of *Agyrtes* from China, and new faunistic data on Palaearctic Agyrtidae (Coleoptera). *Linzer Biologische Beiträge* **31**: 713–718.
- SCHAWALLER W. 2005: New species and records of Agyrtidae (Coleoptera) from the Nepal Himalayas. *Mitteilungen aus dem Museum für Naturkunde in Berlin – Deutsche Entomologische Zeitschrift* **52**: 115–123.
- SEMENOV A. 1893: Revisio specierum ad Silphidarum genera *Pteroloma* Gyllh. et *Lyrosoma* Mannh. spectantium. *Trudy Russkago Entomologicheskago Obshchestva* **27**: 335–346.
- NEWTON A. F. 2005: 11.3. Agyrtidae Thomson, 1859. Pp. 261–269. In: BEUTEL R. G. & LESCHEN R. A. B. (eds.): *Handbook of Zoology, Volume IV: Arthropoda: Insecta, Part 38: Coleoptera, Beetles. Volume 1: Morphology and Systematics (Archostemata, Adephaga, Myxophaga, Polyphaga partim)*. Walter de Gruyter, Berlin & New York, xi + 567 pp.
- SEMENOV-THIAN-SHANSKIJ A. 1932: Le caractère zoogéographique du groupe des Pterolomini (Coleoptera, Silphidae) dans la faune paléarctique. *Doklady Akademii Nauk SSSR* **1932**: 338–341 (in Russian and Latin, with French title).
- ZHOU H.-Z., YU X.-D. & LUO T.-H. 2005: Discovery of the subfamily *Necrophilinae* (Coleoptera: Agyrtidae) in China and description of a new species of *Necrophilus* Latreille. *Coleopterists Bulletin* **59**: 62–69.