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Revisional notes on the genus *Laccobius*. I. Subgenus *Glyptolaccobius* (Coleoptera: Hydrophilidae)

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Abstract. Species of the subgenus *Glyptolaccobius* Gentili, 1989, of the genus *Laccobius* Erichson, 1837, are revised, keyed, and their male genitalia are figured. Twelve species are recognized within the subgenus, of which *L. pluvialis* sp. nov. (India: Meghalaya), *L. shorti* sp. nov. (Thailand: Kanchanaburi) and *L. silvester* sp. nov. (India: Uttar Anchal) are newly described. A historical outline of the studies on the subgenus and its differential characters within the genus *Laccobius* are mentioned and discussed.

Key words. Coleoptera, Hydrophilidae, *Laccobius*, *Glyptolaccobius*, taxonomy, revision, new species, key to species, Oriental region, Himalaya

Introduction

Genus *Laccobius* Erichson, 1837, was subdivided into various subgenera by earlier and recent authors who did not always follow the same criteria. BLACKBURN (1895) described a new species of Australian Hydrophilidae, *Notoberosus zietzi* Blackburn, 1895; later, D'ORCHYMONT (1925) considered *Notoberosus* Blackburn, 1895 as a subgenus of *Laccobius*. GANGLBAUER (1904) erected two new subgenera: *Compsolaccobius* Ganglbauer, 1904 for *L. decorus* (Gyllenhal, 1827) and *Ortholaccobius* Ganglbauer, 1904 for *L. pommayi* Bedel, 1881. ZAITZEV (1938) created *Dimorpholaccobius* Zaitzev, 1938 (for *L. sulcatulus* Reitter, 1909) but this subgenus was overlooked by European entomologists. SATÔ (1966) described two Hydrophilidae from New Caledonia under the new genus *Yateberosus* Satô, 1966, later considered by GENTILI (1980) as a subgenus of *Laccobius*. GENTILI & CHIESA (1975) based their revision of the Palaearctic *Laccobius* on a subdivision into a number subgenera three of which were instated by GENTILI (1974): *Platylaccobius* Gentili, 1974, *Macrolaccobius* Gentili, 1974, and *Microlaccobius* Gentili, 1974. Later on, GENTILI (1989, 1991) described the subgenera *Glyptolaccobius* Gentili, 1989 and *Cyclolaccobius* Gentili, 1991. Finally, HANSEN (1991) considered *Macrolaccobius* a junior synonym of *Dimorpholaccobius* and *Platylaccobius* a junior synonym of *Hydroxenus* Wollaston, 1867.

Moreover, many published taxonomic revisions of the genus *Laccobius* (CHEARY 1971; GENTILI & CHIESA 1975; VAN BERGE HENEGOUWEN 1982; SHATROVSKIY 1984; GENTILI 1981, 1985,

1986a, b, 1995, 2003, 2005) were focused on faunas of particular biogeographic regions or geographic areas rather than on the taxonomy of likely monophyletic groups.

This paper, dealing with the species of the subgenus *Glyptolaccobius*, is the first of a planned series of studies revising and re-evaluating critically the taxonomy of the subgenera of *Laccobius*. It provides a short historical review of the classification and morphological and systematic studies on the subgenus *Glyptolaccobius*, and describes the presently known defining characters of the subgenus. Twelve species are included, of which three are described as new. All species of the subgenus seem to share a Himalayan and peri-Himalayan distribution. Based on known habitat data, they appear to prefer living in seepage habitats, such as near waterfalls, puddles of stagnant water, and along banks of creeks.

Historical review

The subgenus *Glyptolaccobius* was created by GENTILI (1989) for *Laccobius affinis* Knisch, 1927 (type species), *L. celsus* Gentili, 1989, *L. incisus* Gentili, 1989, *L. jaechi* Gentili, 1988, and *L. senguptai* Gentili, 1979. The subgenus was distinguished from all other *Laccobius* subgenera by a parasutural furrow on the elytra.

Surprisingly, KNISCH (1927) did not mention the parasutural furrows in his description of *L. affinis*, although it seems improbable that he did not observe them. He might have been confused about the assignment of this insect of the subtribus Hydrobiae with parasutural sulci to *Laccobius*, and therefore did not mention this feature.

Three additional species of *Glyptolaccobius* were described by GENTILI (1995): *L. egregius* Gentili, 1995, *L. munus* Gentili, 1995, and *L. sharmai* Gentili, 1995. In the same paper, another character distinguishing *Glyptolaccobius* from other subgenera of *Laccobius* was proposed: eyes transverse, reniform or oblique in dorsal view. Finally, HEBAUER (2002) described a new species from Nepal, *L. eliogentilii* Hebauer, 2002, in his study on the Hydrophilidae of northern India and southern Himalaya.

Material and methods

I have examined nearly 300 specimens of *Glyptolaccobius* in the course of this study. Nearly 30 additional locality data were adopted from HEBAUER (2002). The specimens studied are rather uniform in most external characters; I therefore provide full descriptions only for the three new species. I follow morphological nomenclature used in the general description of the genus *Laccobius* by HANSEN (1991). All other species are keyed and their differential diagnoses are presented, allowing their easy identification. The total body sizes of holotypes and lectotypes are given as total length times (×) total width.

The following acronyms are used for museums or collections in which the examined specimens are deposited:

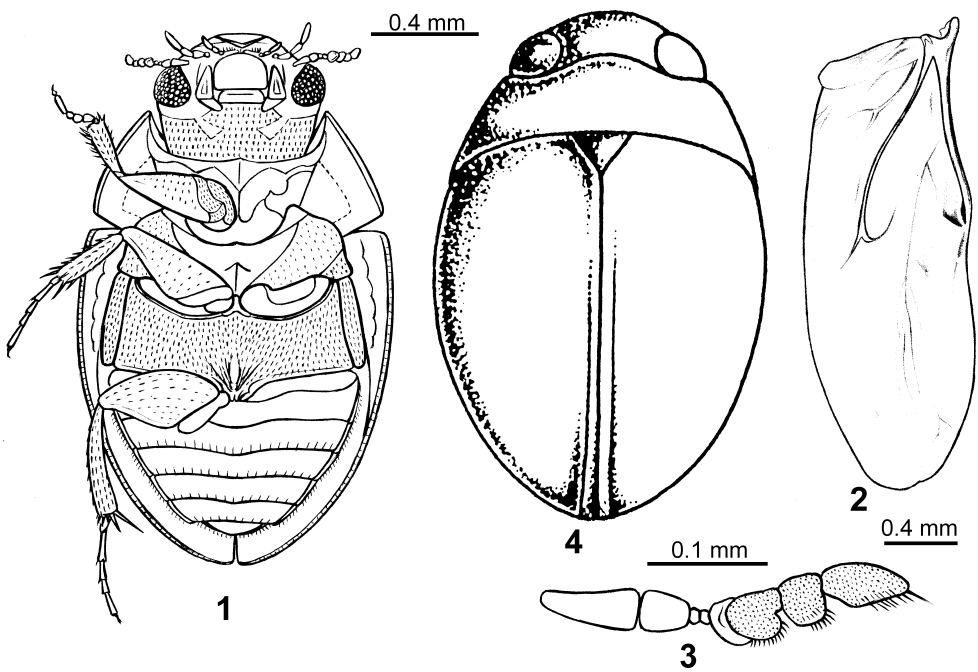
ASCI Andrew E. Z. Short collection, Ithaca, New York, USA;
CFHG Franz Hebauer collection, Grafling, Germany;
CMSN Masataka Satô collection, Nagoya, Japan;
CSHG André Skale collection, Hof/Saale, Germany;

IMZC Indian Museum, Zoological Survey of India, Calcutta, India;
ISNB Institut Royal des Sciences Naturelles de Belgique, Bruxelles, Belgium;
MHNG Muséum d'Histoire Naturelle, Genève, Switzerland;
MSNV Museo Civico di Storia Naturale, Verona, Italy;
MTDG Museum für Tierkunde Dresden, Germany;
NHMW Naturhistorisches Museum Wien, Austria;
NHML Natural History Museum, London, United Kingdom;
NMEG Naturkunde Museum Erfurt, Germany;
NMNH U.S. National Museum of Natural History, Washington, USA;
NSMT Natural Sciences Museum Tokyo, Japan.

Differential diagnosis

As all other subgenera of *Laccobius*, *Glyptolaccobius* exhibits the following autapomorphies of the genus within the tribe *Laccobiini*: six visible abdominal sternites, dilated foretarsi of males, tip of hind trochanters not abutted to hind femora, and the presence of swimming hairs on the dorsal surface but not on the ventral surface of tarsi.

Differential characters of *Glyptolaccobius* within the genus *Laccobius* in my opinion include: (1) eyes reniform and oblique; (2) parasutural furrow on elytral surface; (3) antennal cupule partly asymmetrical; (4) swimming hairs of middle and hind tarsi sparse and short.



Figs. 1-4. 1-3 – *Laccobius pluvialis* sp. nov., paratype. 1 – habitus, ventral view; 2 – right wing; 3 – right antenna. 4 – *L. incisus* Gentili, 1989, paratype, habitus, dorsal view.

Key to the species of the subgenus *Glyptolaccobius*

1 Hind tibiae straight. Total length 1.9-2.2 mm. ..... ***L. senguptai*** Gentili, 1979
– Hind tibiae curved. **2**
2 Elytra shining or pubescent, with longitudinal rows of punctures. **3**
– Elytra pubescent, with unordered punctures. **7**
3 Rows of punctures sulciform on whole elytra. Mentum rugose. Apices of parameres swollen. Total length 2.4-2.6 mm. ..... ***L. celsus*** Gentili, 1989
– Rows of punctures not sulciform, or sulciform only near suture. Mentum smooth or microgranulated. Apices of parameres not swollen. Total length less than 2.3 mm. **4**
4 Elytra black, only lateral margins and apex yellowish; striae pubescent, not sulciform. **5**
– Elytra black with yellowish dots and stripes; striae glabrous, not impressed or sulciform. **6**
5 Anterior and posterior pronotal margin entirely black. Phallobase distinctly shorter than parameres. Total length 2.2 mm. ..... ***L. silvester*** sp. nov.
– Anterior and posterior pronotal margins lighter, yellowish near lateral corners. Phallobase nearly as long as parameres. Total length 1.7-2.0 mm. ..... ***L. shorti*** sp. nov.
6 Mentum smooth. Elytra with yellowish dots; parasutural furrow nearly as long as half of elytral length; 2-3 striae near suture partly sulciform. Length 1.9-2.2 mm. .... ***L. munus*** Gentili, 1995
– Mentum microgranulated. Elytra with yellowish dots and stripes; parasutural furrow nearly as long as one third of elytral length; striae not sulciform. Length 2.0-2.2 mm. .... ***L. sharmai*** Gentili, 1995
7 Stripes and dots on elytral surface pale. Parasutural furrow shorter, recognizable barely in the posterior fifth. **8**
– Elytral surface except margins and apex uniformly dark. Parasutural furrow longer. ... **10**
8 Elytra with distinct yellow stripes and spots beside suture. Phallobase distinctly shorter than parameres; median lobe straight without swelling. Total length 1.6-1.8 mm. .... ***L. eliogentilii*** Hebauer, 2002
– Elytra without distinct yellow stripes or spots beside suture. Phallobase nearly as long as parameres, or median lobe with subapical swelling. **9**
9 Elytral base bearing four yellow-white spots; apical half of elytra with yellow-white stripes. Phallobase nearly as long as parameres, median lobe without swelling. Length 1.7-2.0 mm. ..... ***L. jaechi*** Gentili, 1988
– Elytral base without clear spots; apical half with yellow-chestnut stripes. Phallobase distinctly shorter than parameres, median lobe with subapical swelling. Length 1.7-2.2 mm. ..... ***L. pluvialis*** sp. nov.
10 Parasutural furrow not reaching elytral apex. Head and pronotum with light shagreen at 80x magnification. Inner side of parameres with longitudinal subapical excision. Total length 1.8 mm. ..... ***L. egregius*** Gentili, 1995
– Parasutural furrow reaching elytral apex. Head and pronotum smooth, without shagreen at 80x magnification. Parameres without longitudinal excision. **11**

11 Anterior apex of mesosternal keel simple, with vertical tooth. Punctures of head and pronotum bearing black setae. Apex of each paramere hooked at interior side. Length 1.8-2.1 mm. ..... ***L. incisus*** Gentili, 1989

– Anterior apex of mesosternal keel arrowhead-shaped. Punctures of head and pronotum bearing pale setae. Apices of parameres not hooked. Length 1.7-2.0 mm. ..... ***L. affinis*** Knisch, 1927

Taxonomy

The twelve species of *Glyptolaccobius* are ordered alphabetically.

Laccobius (*Glyptolaccobius*) *affinis* Knisch, 1927

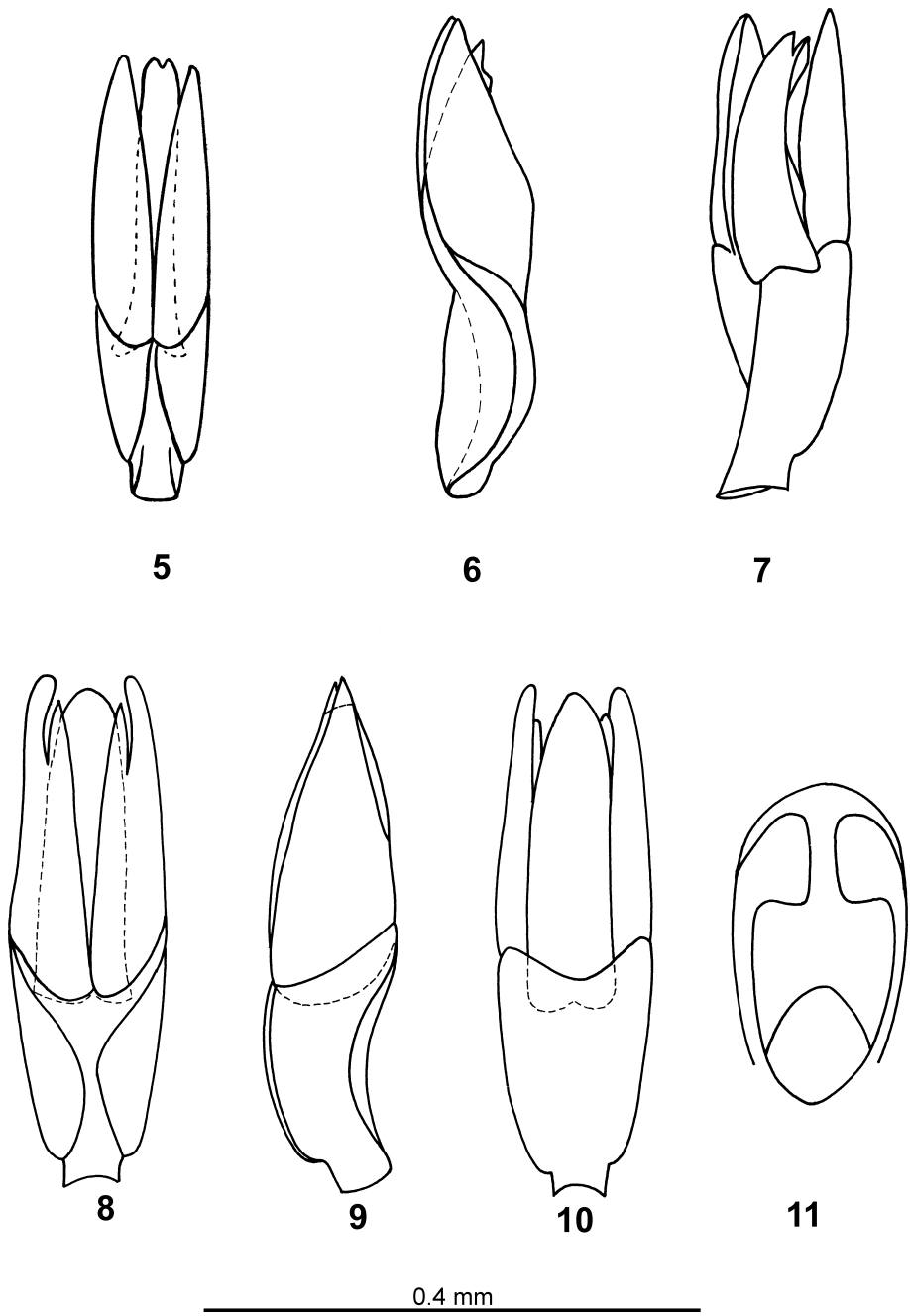
(Figs. 5-7)

Laccobius (s. str.) *affinis* Knisch, 1927: 132.
Laccobius (s. str.) *affinis*: d'Orchymont (1928): 140.
Laccobius (*Platylaccobius*) *affinis*: Gentili (1979): 31.
Laccobius (*Glyptolaccobius*) *affinis*: Gentili (1989): 36; Gentili (1995): 253; Hansen (1999): 130; Hebauer (2002): 12.

Type locality. India, Uttar Pradesh, Kumaon, Gori Valley, 2300 m a.s.l.
Type material examined. Lectotype: ♂, 2.0 × 1.1 mm (NHML): 'Gori Valley, Kumaon, India, 7000 ft H.G.C. / Knisch det. 1925 Laccobius s.str. affinis Kn. [handwritten] / Coll. A.Knisch COTYPUS'. Paralectotypes: 6 spec. (3 NHML, 3 ISNB). The three paralectotypes from NHML are mounted on separate cards, with labels as for the lectotype. Two of the three paralectotypes from ISNB (male and female) are mounted on one card, with labels: 'Coll. R.I.Sc.N.B., Inde, Gori Valley, Kumaon, India, 7000 ft H.G.C. / Knisch det. 1925 Laccobius s.str. affinis Kn. / Coll. A.Knisch COTYPUS'. The last specimen is a male of *L. egregius* (see under that species).

Following the text of Knisch (1927): 'Typus im British Museum, London' I designated one of the specimens in NHML as a lectotype (Gentili 1978). The three specimens from ISNB come from the Knisch collection: 'Sieben Exemplare liegen nur durch Güte des Herrn G. C. Champion vor, von welchen drei freundl. meiner Sammlung überlassen wurden' ['There are seven specimens available due to the kindness of Mr. G. C. Champion, three of which were kindly donated for my collection.'] (Knisch 1927).
Additional material examined. INDIA: Uttar Pradesh, Gori Valley, Kumaon 7000′, H. G. Champion leg., 1 ♂ 1 ♀ (MSNV). **NEPAL:** Annapurna Mts., Baglung Lekh, ca 18 km W Baglung, upp. Okhle village, 2300 m a.s.l., 13.v.2004, J. Schmidt leg., 1 ♂ 2 ♀♀ (NHMW); Sankua Sabha Distr., above Pahakhola, 2600-2800 m a.s.l., *Quercus semecarpifolia*, *Rhododendron*, 31.v-3.vi.1988, Martens & Schawaller leg., 1 ♂ (CFHG); Solukhumbu Distr., above Nunthala, 2300-2500 m a.s.l., 13.v.1997, W. Schawaller leg., 1 ♂ (CFHG).
Material not examined. NEPAL: 'Prov. Gandaki, Distr. Kaski, Ghorepani nr. Tatapani, 2800-2500 m, leg. Wolf 23.4.2000 (NMEG)' (Hebauer 2002).

Differential diagnosis. *Laccobius affinis* belongs to species with unordered elytral punctures and curved hind tibiae. It resembles *L. egregius* and *L. incisus* by the dark elytral colour without clear spots and stripes. From these species it is chiefly distinguished by its aedeagus (Figs. 5-7) with simple parameres, i.e. not excised or hooked at apices. Externally, *L. affinis* differs from the latter two species by the lack of shagreen and black hairs on the head and pronotum, arrowhead-shaped anterior margin of the mesosternal keel, and the parasutural furrow reaching elytral apex.
Distribution. India (Uttar Pradesh), Nepal.



Figs. 5-11. 5-7 – *Laccobius affinis* Knisch, 1927, aedeagus. 5 – paralectotype, dorsal view; 6 – lectotype, lateral view; 7 – lectotype, ventral view. 8-11 – *L. egregius* Gentili, 1995, holotype. 8 – aedeagus, dorsal view; 9 – ditto, lateral view; 10 – ditto, ventral view; 11 – genital segment.

Laccobius (*Glyptolaccobius*) *celsus* Gentili, 1989

(Figs. 12-14)

Laccobius (*Glyptolaccobius*) *celsus* Gentili, 1989: 36.
Laccobius (*Glyptolaccobius*) *celsus*: Hansen (1999): 130; Hebauer (2002): 13; Gentili (2003): 412.

Type locality. Nepal, Mid-Western Region, near Jumla, Chautha – Bhulbhule.
Type material examined. Holotype: ♂, 2.4 × 1.6 mm (NSMT): '(W NEPAL) / nr. Jumla / Chautha (2850 m) - / Bhulbhule (3270 m) / 23.IX.1981 / M. Sakai // E. Gentili det. 1988 / Laccobius ♂ / celsus n.sp. // [red label] Holotypus ♂'. Paratype: ♂ (MSNV): '(W. NEPAL) / Neurgar / 2800 m alt. / Jumla Dist. / 28.IX.1981 / M. Tomokuni // [red label] Paratypus ♂ // E. Gentili det. 1988 / Laccobius ♂ / celsus n.sp'.
Additional material examined. NEPAL: Mid-Western Region, Karnali Prov., Distr. Dolpa, Kagmara Lekh, stream on a steep slope, 3800 m a.s.l., 13.v.1995, A. Weigel leg., 2 ex. (NHMW); Distr. Dolpa, Kagmara Lekh, stream near steep cliff, 3800 m a.s.l., 13.v.1995, A. Weigel leg., 3 ♂♂ 7 ♀♀ (MSNV, NMEG).

Differential diagnosis. *Laccobius celsus* belongs to the group of species with curved hind tibiae and longitudinal rows of punctures on the elytra. The rows are sulciform on the whole elytra and the parameres have swollen apices (Figs. 12-14). The latter two characters distinguish it from all other species of *Glyptolaccobius*.
Distribution. Nepal (Mid-Western Region, Jumla and Dolpa districts).

Laccobius (*Glyptolaccobius*) *egregius* Gentili, 1995

(Figs. 8-11)

Laccobius (*Glyptolaccobius*) *egregius* Gentili, 1995: 252.
Laccobius (*Glyptolaccobius*) *egregius*: Hansen (1999): 130; Hebauer (2002): 13.

Type locality. India, Uttar Pradesh, Kumaon, Gori Valley, 2300 m a.s.l.
Type material examined. Holotype: ♂, 1.8 × 1.1 mm (NHML): 'Gori R. Valley / Kumaon, India / 7000 ft H.G.C. // E. Gentili det. 1994 / Laccobius ♂ / egregius m. // [red label] Holotypus'. Paratypes: 2 ♂♂ 2 ♀♀ (NHML, MSNV) same data as holotype; 1 ♂ (NHML): 'Gori R. Valley / Kumaon, India / 5000 ft H.G.C. //; 1 ♂ NHML: // Dhabari, C. Almora / H.G.C. X.1926'.
Additional material examined. INDIA: Uttar Pradesh, N Kumaon, Gori R. Gorge, 1400-2600 m a.s.l., H. G. Champion leg., 1 ♂ (ISNB): 'Knisch det. 1925 / Laccobius s.str. affinis Kn. // Coll. A. Knisch / Cotypus // Laccobius egregius ♂ / E. Gentili det. 2003'. This specimen is a syntype of *L. affinis*.

Differential diagnosis. *Laccobius egregius* belongs to the group with unordered elytral punctures and curved hind tibiae. Within the group it is characterized by the dark elytra without clear spots and stripes, thus resembling *L. affinis* and *L. incisus*. It is chiefly distinguishable from these two species by the shape of the aedeagus (Figs. 8-11), with parameres excised along interior margin. It also has light shagreen and lacks black hairs on the head and pronotum, and the parasutural furrow does not reach the elytral apex.
Distribution. India (Uttar Pradesh).

Laccobius (*Glyptolaccobius*) *eliogentilii* Hebauer, 2002

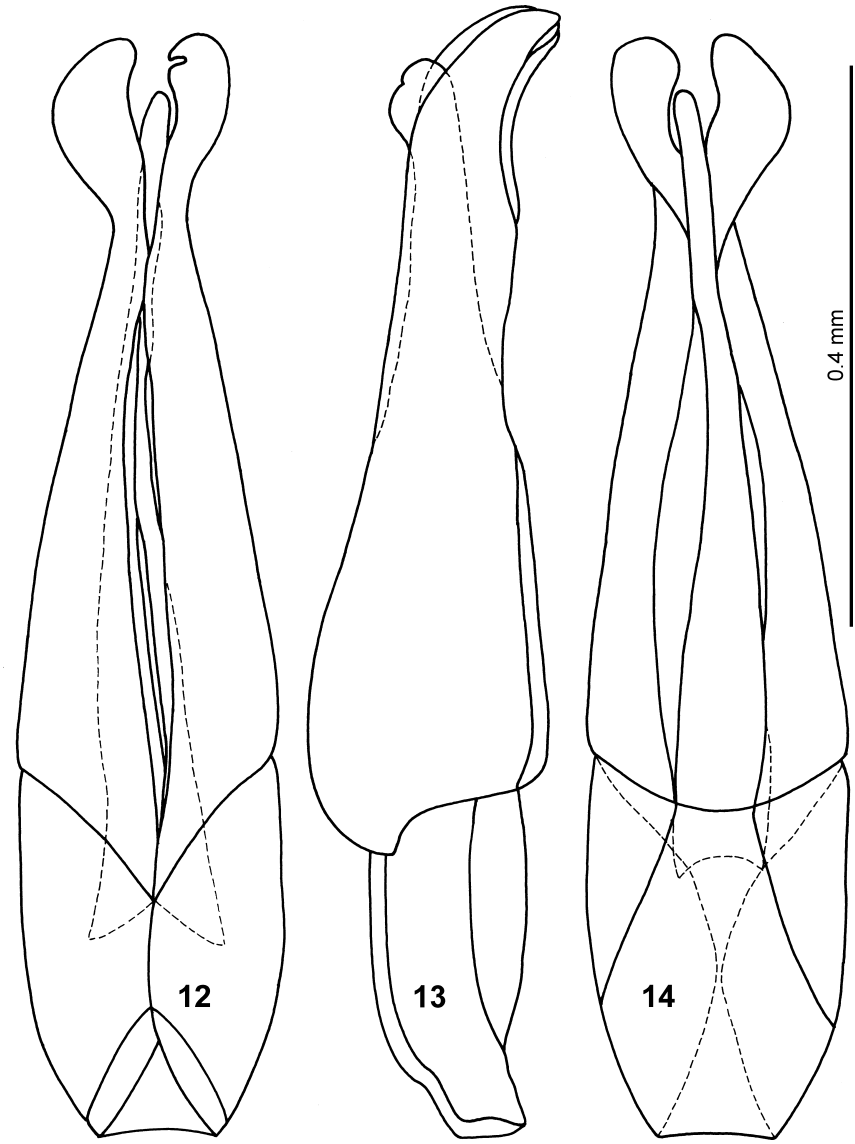
(Figs. 15-16)

Laccobius (*Glyptolaccobius*) *eliogentilii* Hebauer, 2002: 14.
Laccobius (*Glyptolaccobius*) *eliogentilii*: Gentili (2003): 412.

Type locality. Nepal, Annapurna Region (NW of Pokhara), S slope of Krapa Danda, 1800-1900 m a.s.l.
Type material (not examined). Holotype: ♂ (MTDG): 'NEPAL, Annapurna-Region / (nordöstlich Pokhara) / südl. unterh. Krapa Danda, / 1800-1900 mNN / 27.-28.V.1997, leg. O. Jäger'. Paratypes: 2 ♂♂ 2 ♀♀ (MTDG,

CFHG, MSNV), same data as holotype; 2 ♂♂ (MTDG), 'Nepal, Mt. Panchase (15 km W Pokhara) E slope, Creek upper Sidhane, 2000 m, O. Jäger 18.5.1997'.

Additional material examined. BHUTAN: SARPANG prov., 13 km SE Damphu, Sarpung-Damphu Pass, E slope, ca 1700 m a.s.l., 26°56′52″N 90°12′35″E, 27.xi.2005, M. Jäch leg., 2 ♀♀ (NHMW). **NEPAL:** Manasiu Mts., Bara Pokhari Lekh, Chhandi Khola valley, 2000-2200 m a.s.l., 11-12.iv.2003, J. Schmidt lgt., 1 ♂ 1 ♀ (NHMW).



Figs. 12-14. *Laccobius celsus* Gentili, 1989, holotype. 12 – aedeagus, dorsal view; 13 – ditto, lateral view; 14 – ditto, ventral view.

Differential diagnosis. HEBAUER (2002) provided the following differential diagnosis for this species: '[…] extremely close to *L. jaechi* in body shape and colour, corresponding with that species also in its pubescent surface with irregular punctuation and in sutural stria [= parasutural furrow] recognizable barely in the apical fifth. The less extended dark colour of the elytra in contrast leaves besides the suture distinct yellow stripes and isolated spots. The basal piece [= phallobase] of the aedeagophore is distinctly shorter than in *L. jaechi*, the parameres are much more slender, the median lobe surpasses the parameres' (Figs. 15-16).
Distribution. Bhutan, Nepal.

Laccobius (*Glyptolaccobius*) *incisus* Gentili, 1989

(Figs. 4, 17-19)

Laccobius (*Glyptolaccobius*) *incisus* Gentili, 1989: 36.
Laccobius (*Glyptolaccobius*) *incisus*: HANSEN (1999): 130; HEBAUER (2002): 16.

Type locality. Nepal, Solukhumbu, Monjo, 2800 m a.s.l.
Type material examined. HOLOTYPE: ♂, 1.9 × 1.2 mm (NSMT): 'Monjo, 2800 m / Solukhumbu, NEPAL / Sept. 30, 1979 / M. Sato leg. // [red label] Holotypus / E. Gentili'. PARATYPES: 11 ♂♂ 10 ♀♀ (NSMT, MSNV), same data as holotype.
Material not examined. NEPAL: 'Annapurna Mts. N of Pokhara, small river near Siklis 2200 m, 24.04.1996, leg. O. Jäger (MTDG)'. **INDIA:** 'UTTAR PRADESH, C. Almora, Dhabari (NHML)' (all data after HEBAUER 2002).

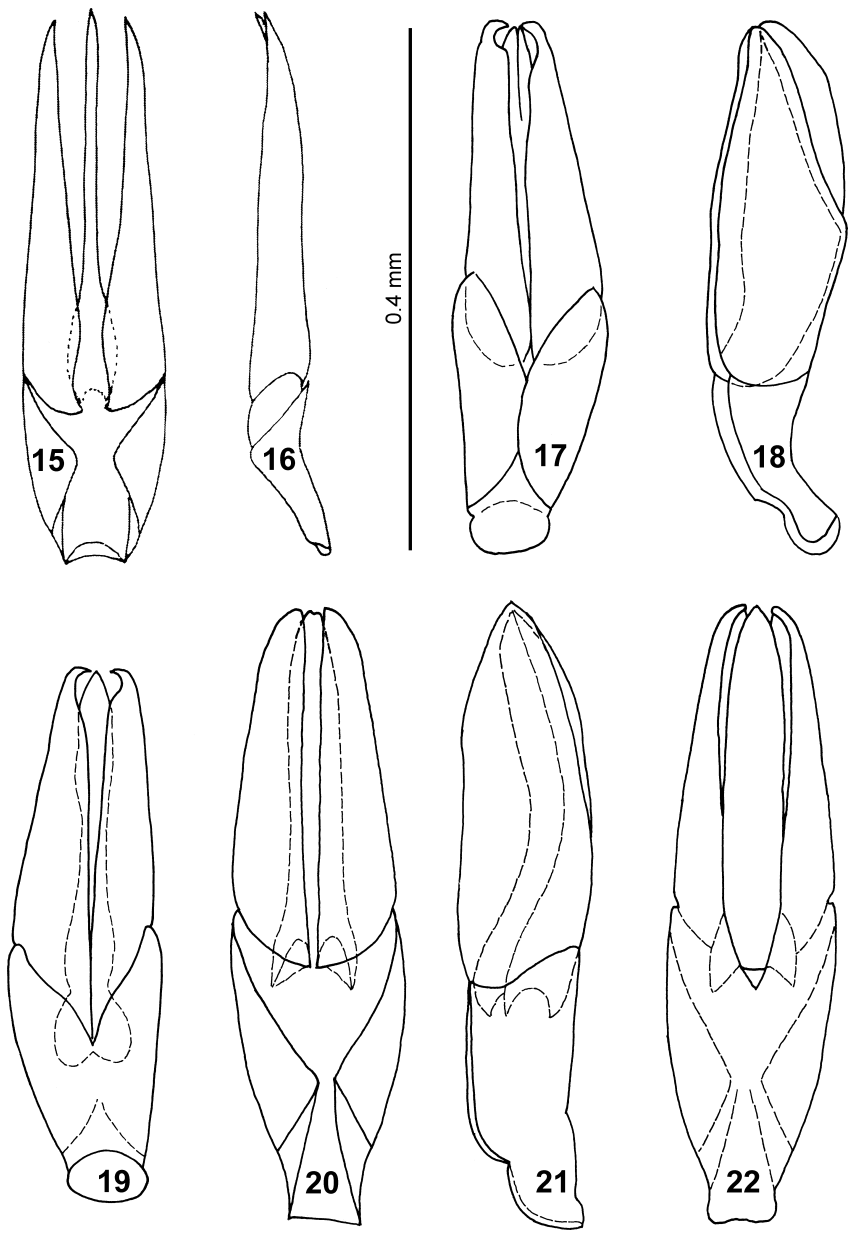
Differential diagnosis. *Laccobius incisus* belongs to the group of species with unordered elytral punctures and curved hind tibiae. Within this group it resembles *L. affinis* and *L. egregius* by the dark elytral colour without clear spots and stripes. It is chiefly distinguishable from these two species by the shape of the aedeagus (Figs. 17-19), with inner margin of the parameres hooked before the apex. Externally, it differs from these species by the lack of shagreen and black hairs on head and pronotum and by the parasutural furrow reaching elytral apex.
Distribution. India (Uttar Pradesh), Nepal.

Laccobius (*Glyptolaccobius*) *jaechi* Gentili, 1988

(Figs. 20-22)

Laccobius (*Platylaccobius*) *jaechi* Gentili, 1988: 32.
Laccobius (*Glyptolaccobius*) *jaechi*: GENTILI (1989): 36; GENTILI (1995): 252; HANSEN (1999): 130; HEBAUER (2002): 16.

Type locality. Nepal, N of Kathmandu, Tibetan frontier near Tatopani, river Buth Khosi.
Type material examined. HOLOTYPE: ♂, 1.7 × 1.0 mm (NHMW): 'Nepal 27.II.81 / Tibetan Grenze / leg. M. Jäch N29 // Tatopani // E. Gentili det. 1987 / Laccobius / jaechi n.sp. // [red label] Holotypus ♂ / E. Gentili 1987'. PARATYPES: 1 ♂ (MSNV): 'NEPAL, Tibetan grenze / Tatopani / M. Jäch 1.3.1981 // [red label] Paratypus ♂ / E. Gentili 1987 // E. Gentili det. 1987 / Laccobius jaechi n.sp.'; 3 ♀♀ (NHMW, MSNV): 'Nepal 1.3.81 / Tibetan.Grenze / leg. M. Jäch N31 // Tatopani // E. Gentili det. 1987 / Laccobius / jaechi n.sp. // [red label] Paratypus ♀ / E. Gentili 1987'.
Additional material examined. NEPAL: 'Janakpur, Sindhu, Shivino Khola 1920 m, leg. M. Satô, (CMSN)' (GENTILI 1995); 'Sagarmatha, Solukhumbu, Khari Khola 2100 m, leg. M. Satô, (CMSN)' (GENTILI 1995); Langtan Area, E Dhunche, small brook, N big road bridge, 28°06′N 85°18′E, 13.xi.2003, Freitag leg., 1 ♂ (NHMW); Kosi, 2 km E Mangsingma, 1900 m a.s.l., Löbl & Smetana leg., 1 ♀ (CFHG); Taplejung Distr., Omje Kharka NW Yamputhin, 2300-2500 m a.s.l., 1.-6.v.1988, Schawaller leg., 1 ♀ (CFHG); BAGMATI prov., below Tarke Ghyang, 2200 m a.s.l., 19.iv.1981, Löbl & Smetana lgt., 2 ♂♂ (CFHG).



Figs. 15-22. 15-16 – *Laccobius eliogentilii* Hebauer, 2002 (after HEBAUER 2002). 15 – aedeagus, dorsal view; 16 – ditto, lateral view. 17-19 – *L. incisus* Gentili, 1989, holotype. 17 – aedeagus, dorsal view; 18 – ditto, lateral view; 19 – ditto, ventral view. 20-22 – *L. jaechi* Gentili, 1988, holotype. 20 – aedeagus, dorsal view; 21 – ditto, lateral view; 22 – ditto, ventral view.

Material not examined. NEPAL: 'Annapurna, W Pokhara, Mt. Panchhase 2000-2300 m, leg. Schmidt (NMEG); Annapurna Region, Ulleri – Ghorepani 2100-2800 m, leg. A. Skale (CSHG); S Annapurna, Lamjung Himal, Madi Khola Tal, 3 km N Siklis, creek under Dhara Kharka 1750 m, leg. O. Jäger (MTDG)' (all data after HEBAUER 2002).

Differential diagnosis. *Laccobius jaechi* belongs to the group of species with unordered elytral punctures and curved hind tibiae. Within this group it resembles *L. eliogentilii* and *L. pluvialis* sp. nov. by the pale spots and stripes on elytra. It is chiefly distinguishable from them by the shape of the aedeagus (Figs. 20-22) with the phallobase nearly as long as the parameres. Externally, it differs from the latter two species by smaller black elytral areas leaving four pale spots near base and longitudinal stripes in the posterior half.
Distribution. Nepal.

Laccobius (*Glyptolaccobius*) *munus* Gentili, 1995

(Figs. 23-26)

Laccobius (*Glyptolaccobius*) *munus* Gentili, 1995: 251.
Laccobius (*Glyptolaccobius*) *munus*: HANSEN (1999): 130; HEBAUER (2002): 17.

Type locality. Nepal, Bagmati province, below Tarke Ghyang, 2200 m a.s.l.
Type material examined. HOLOTYPE: ♂, 2.1 × 1.3 mm (MHNG): 'NEPAL (Prov. Bagmati) / below Tarke Ghyang 2200 m / 19.IV.81 / Löbl & Smetana // E. Gentili det. 1992 / Laccobius (Glyptol.) / munus n. sp. // [red label] HOLOTYPUS / E. Gentili 92'. PARATYPES: 1 ♂ (CFHG), same data as holotype; 1 ♂ (MSNV): 'NEPAL (Prov. Bagmati) / Malemchi, 2800 m / 16.IV.81 / Löbl & Smetana // [red label] PARATYPUS / E. Gentili 92 // E. Gentili det. 1992 / Laccobius (Glyptol.) / munus n. sp.'.
Additional material examined. NEPAL: Annapurna region, near Ghorepani, 2800 m a.s.l., 28°24′N 83°42′E, 22.iv.2000, A. Skale leg., 1 ♂ (CFHG); Annapurna Mts. N of Pokhara, small river near Siklis, 2200 m a.s.l., 24.iv.1996, O. Jäger leg., 1 ♂ 1 ♀ (CFHG); Annapurna Region, Siklis Mts., nr. Pokhara, Nyauli-Kharka, small stream, 2400-2500 m a.s.l., 22.iv.1996 O. Jäger leg., 1 ♀ (CFHG); Annapurna Region, Ulleri-Ghorepani, 2100-2800 m a.s.l., 21.iv.2000, A. Skale leg., 1 ♂ (CFHG); Siklis Mts., SE Annapurna Mts., stream by Kyojo-Kharka, 1850 m a.s.l., 28.vi.1996, O. Jäger leg., 1 ♀ (CFHG); BAGMATI prov., Malemchi, 2800 m a.s.l., 18.iv.1981, Löbl & Smetana leg., 1 ♂ (CFHG).
Material not examined. **NEPAL**: same data as holotype and paratypes; 'Annapurna region, Siklis mts ca 15 km N Pokhara, creek over Chipli/Khilang 2300 m, 24.IV.1996, leg. O. Jäger (MTDG); Siklis mts, Nyauli-Kharka, small stream 2400-2500 m, 22.IV.1996, leg. O. Jäger (MTDG); Siklis mts, creek near Kyojo-Kharka 1850 m, 28.IV.1996, leg. O. Jäger (MTDG, CFHG); Annapurna, W Pokhara, mt. Panchase 2000-2300 m, 18.V.1997, leg. Schmidt (CFHG); mt. Panchase, 20 km W Pokhara, NE Hang, temporary creek 2300 m, 20.V.1997, leg. O. Jäger (MTDG); Annapurna mts, Lamjung Himal, Taunja Danda NW slope 2300 m, 6.V.1996, leg. O. Jäger (MTDG); Narayani province, Sauraha, Rapti River 180 m, 27°35′N 84°30′E, 18.IV.2000, leg. F. Wolf (NMEG); GANDAKI province, Kaski district, Ghorepani near Tatopani 2800-2500 m, 23.IV.2000, leg. F. Wolf (NMEG)' (all data adopted from HEBAUER 2002).

Differential diagnosis. *Laccobius munus* belongs to the group of species with curved hind tibiae and longitudinal rows of elytral punctures. The rows are glabrous (in contrast to *L. shorti* sp. nov. and *L. silvester* sp. nov.) and sulciform only near the elytral suture (in contrast to *L. celsus* and *L sharmai*). Apices of parameres are not swollen and with inner margin excised (Figs. 23-26). Other distinguishing characters of *L. munus* include large eyes with the interocular space scarcely wider than one eye diameter, the flat postlabium without punctures, and the median carina on ventrite 1.
Distribution. Nepal.

Laccobius (*Glyptolaccobius*) *pluvialis* sp. nov.

(Figs. 1-3, 27-29)

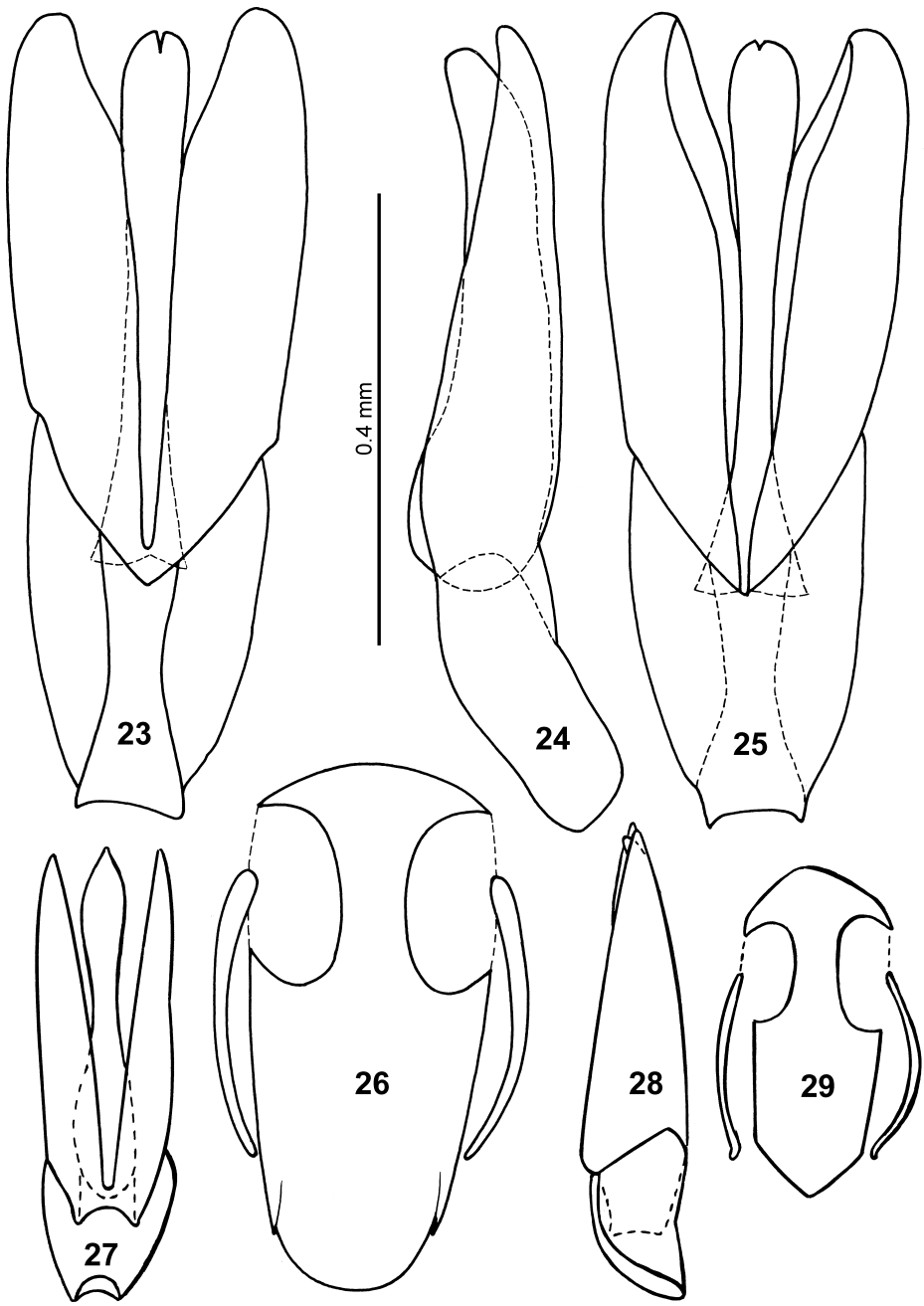
Type locality. India NE, Meghalaya, SW of Cherrapunjee, 900 m a.s.l.
Type material. HOLOTYPE: ♂, 1.9 × 1.1 mm (NHMW): 'NE INDIA, MEGHALAYA, / SW of CHERRAPUNJEE, / 25°13-14′N, 91°40′E, / 5.-24.V.2005, 900 m, / P. Pacholatko leg.'. PARATYPES: 180 spec. (NHMW, MSNV, CFHG), same data as holotype.

Description. Total length 1.7-2.2 mm, total width 1.0-1.2 mm. Body (Fig. 1) oval, convex, its outline not interrupted between pronotum and elytra; elytra not explanate.

Head. Labrum of males without specula; trapezoidal in dorsal view, with straight anterior and posterior margins and faintly oblique sides. Clypeus strongly convex, not deflexed towards margins, black and shining, without distinct 'systematic punctures'. Eyes oblique, slightly reniform in lateral view, straight anteriorly and emarginate posteriorly, weakly convex, not protruding, separated by a little more than 2.5 times the width of one eye. Maxillary palpi less than 0.5x as long as head wide; palpomere 2 not swollen, as wide as palpomere 3; apical segment nearly 0.3 times as long as whole palpus, asymmetrical, outer margin nearly straight, inner margin rounded, with truncate apex. Mentum ca 1.5 times as wide as long, surface punctate, almost flat. Eight antennomeres (Fig. 3); scape (antennomere 1) longer than antennomeres 2-4 together; pedicel (antennomere 2) cone shaped; two intermediate antennomeres (3-4) very short; cupule (antennomere 5) slightly asymmetrical, crescent-shaped in ventral view, nearly flat in dorsal view; segment 3 of club nearly twice as long as segment 1, the latter more stout but nearly as long as segment 2 of club.

Thorax. Pronotum smooth and shining, without distinct 'systematic punctures', only with sparse and faint punctures; disc black, yellow lateral margins wider posteriorly. Prosternum well developed, disc slightly bulging; median carina fine and in part obsolete. Mesoventrite only reaching anterior margin of mesothorax in a single point, rather flat except for median carina, the latter more raised anteriorly and forming a small acute tooth anterior of mesocoxae. Metaventrite with middle portion rather weakly raised and slightly projecting anteriorly between mesocoxae, covered with hydrofuge pubescence except for posteromedian glabrous area on raised middle portion. Anepisternum 3 ca 3.5 times as long as wide, subparallel. Elytra with a hardly visible parasutural stria on posterior third, without trace of serial punctures; dark on disc, near suture and along anterior margin, chestnut-yellow near posterior and lateral margins, with yellow and darker colours mixed in contact zone; lateral margins not serrate nor denticulate; epipleura oblique, pseudepipleura nearly vertical, separated by distinct ridge consisting of small arcs; their anterior widened portion ending before metacoxae. Hind wing (Fig. 2) with r-m crossvein rising from distal half of the pigmented area at anterior wing margin; wedge cell only slightly more than half as long as basal cell; jugal lobe distinctly demarcated from remainder of wing by sharp and rather deep excision at posterior wing margin.

Legs. Fore coxae pubescent, almost contiguous; middle coxae separated by median carina of mesoventrite; trochanters pubescent, especially middle ones; tips of hind trochanters free, not abutted to hind femora. Femora with distinct tibial grooves distally on inner face; base of fore femora pubescent, middle and posterior femora nearly glabrous, middle femora with a subbasal patch of dense stiff setae in both sexes. Tibiae relatively short and stout, progressively wider towards apices, spiny, with three longitudinal series of short spines and two large apical thorns; without swimming hairs; hind tibiae curved inward. Fore tarsomeres 2 and 3



Figs. 23-29. 23-26 – *Laccobius munus* Gentili, 1995, holotype. 23 – aedeagus, dorsal view; 24– ditto, lateral view; 25 – ditto, ventral view; 26 – genital segment. 27-29 – *L. pluvialis* sp. nov., holotype. 27 – aedeagus, ventral view; 28 – ditto, lateral view; 29 – genital segment.

expanded in males; middle and hind tarsi with fine and sparse swimming hairs on dorsal face; hind tarsomere 1 much shorter than tarsomere 2. Claws of moderate size, robust, weakly curved.

Abdomen. Six visible ventrites, ventrites 1-5 rather shiny and sparsely pubescent, ventrite 6 more dull, densely pubescent and somewhat retractable; ventrite 1 not carinate; posterior margin of ventrite 5 subtruncate.

Male genitalia. Aedeagus as in Figs. 27-29; phallobase nearly 0.5 times as long as parameres, median lobe with swelling before apex.

Differential diagnosis. *Laccobius pluvialis* sp. nov. is extremely close to *L. jaechi* and *L. eliogentilii* in body shape and colour, including the pubescent surface with irregular punctation and the parasutural furrow recognizable barely in the apical fifth. The elytra lack basal spots and parasutural stripes but are widely chestnut-yellowish near the lateral margins and apex. The phallobase is distinctly shorter than in *L. jaechi*; finally, the subapical swelling of the median lobe differentiates this species from *L. eliogentilii*.

Etymology. This species is named in reference to the extreme rainfall records reported from the area close to the type locality.

Distribution. India (Meghalaya). So far known only from the type locality.

Laccobius (*Glyptolaccobius*) *senguptai* Gentili, 1979

(Figs. 30-31)

Laccobius (*Notoberosus*) *senguptai* Gentili, 1979: 29.
Laccobius (*Glyptolaccobius*) *senguptai*: Gentili (1989): 36; Hansen (1999): 130.

Type locality. Myanmar, Lower Burma, Amherst Distr., Dawna Hills, 700-1000 m a.s.l.

Type material examined. Holotype: ♂, 1.9 × 1.0 mm (IMZC): 'Dawna Hills / 2000-3000 ft / Amherst Dist. / L. Burma / 3.III.1908 N.A. // E. Gentili det., 1979 / Laccobius (Notob.) / senguptai n.sp. // [red label] Holotypus ♂ // 4.0'. Paratype: without head and pronotum (MSNV): 'Dawna Hills / 2000-3000 ft / Amherst Dist. / L. Burma / 3.III.1908 N.A. // E. Gentili det., 1979 / Laccobius (Notob.) / senguptai n.sp. // [red label] Paratypus // 4.0'.

Differential diagnosis. The most important difference of *L. senguptai* from all other known *Glyptolaccobius* are the straight hind tibiae. The elytral punctures are ordered in primary and secondary rows. Aedeagus as in Figs. 30-31.

Distribution. Myanmar (Amherst District, Dawna Hills).

Laccobius (*Glyptolaccobius*) *sharmai* Gentili, 1995

(Figs. 32-33)

Laccobius (*Glyptolaccobius*) *sharmai* Gentili, 1995: 252.
Laccobius (*Glyptolaccobius*) *sharmai*: Gentili (2003): 413; Hansen (1999): 131; Hebauer (2002): 19.

Type locality. Nepal E, Solukhumbu, Surka La Pass, Karka Khola, 2875 m a.s.l.

Type material examined. Holotype: ♂, 2.1 × 1.4 mm (NHMW): 'e nepal: Solukhumbu / Surka La Pass 2875 m / Karka Khola 5.4.1994 / leg. S. Sharma (109) // [red label] Holotypus / E. Gentili 1994 // Laccobius sharmai m. / E. Gentili 1995'. Paratypes: 1 ♀ (MSNV): 'e nepal: Solukhumbu / Kharte, Kharte Khola / 2.4.1994, 2540 m / leg. S. Sharma (105) // [red label] Paratypus // Laccobius sharmai m. / E. Gentili 1995'; 1 ♂ (MSNV) 1 ♀ (NHMW): 'e nepal: 5.4.1994 / Solukhumbu, Rato Bani / Karka Khola / leg. Moog et al. // [red label] Paratypus // Laccobius sharmai m. / E. Gentili 1995'.

Additional material examined. NEPAL: Annapurna region, Ulleri – Ghorepani, 2100-2800 m a.s.l., A. Skale leg., 21.iv.2000 (CSHG); Manasiu Mts., Bara Pokhari Lekh, Chhandi Khola valley, 2000-2200 m a.s.l., 11-12.iv.2003, J. Schmidt leg., 1 ♂ (NHMW); 20 km W Pokhara, Mt. Panchase, NE slope, temporary forest brook, 2300 m a.s.l., 20.v.1997 O. Jäger, 1 ♂ (CFHG); Western region, W Pokhara, Annapurna Mts., Mt. Panchase, 2000-2300 m a.s.l., 18.v.1997, A. Schmidt leg., 1 ♀ (CFHG).

Differential diagnosis. *Laccobius sharmai* belongs to the group of species with longitudinal rows of elytral punctures and curved hind tibiae. The rows are glabrous (in contrast to *L. shorti* sp. nov. and *L. silvester* sp. nov.), not sulciform near elytral suture (in contrast to *L. celsus* and *L munus*). The apices of parameres are not swollen and their interior margins straight (Figs. 32-33). Other significant distinguishing characters of *L. sharmai* include the granulate postlabium with setae rising from the punctures between granulation; the first abdominal sternum provided anteriorly with a median process.
Distribution. Nepal.

Laccobius (*Glyptolaccobius*) *shorti* sp. nov.

(Figs. 36-38)

Type locality. Thailand, Kanchanaburi Prov., Amphur Tong Pha Phum, 500 m a.s.l.
Type material. HOLOTYPE: ♂, 1.7 × 1.1 mm (NMNH): 'THAILAND, Kanchanaburi Prov. / Amphur Tong Pha Phum; small / waterfall 6.3 km W of Border Police / Stn. at Ban Padsadoo Klang, 500 m / 14°32′N 98°32′E; 10 April 2003 / UMC & CMU teams; L-463 // [red label] HOLOTYPUS ♂ / Lacc. shorti m. / E. Gentili 2006'. PARATYPES: 7 ♂♂ 11 ♀♀ 3 spec.: same locality as holotype; 'Chiang Mai Prov., Doi Inthanon N. Park, 1060 m, Huai Sai Lueung WF, 18°31′N 98°27′E; R.W. Sites 20.03.2002', 1 ♂; 'Chiang Mai Prov., Doi Inthanon N. Park, 1379 m Pha Dum Waterfall, rock face 18°36′N 98°31′E; 3.5.2003 UMC-CMU teams coll.', 2 ♂♂ 3 ♀♀; 'Chiang Mai Prov., Doi Inthanon N. Park, Siritharn Waterfall, 18°32′N 98°34′E 829 m; 2.5.2003; l-497; colls. UMC & CMU teams', 2 ♀♀; 'Chiang Mai Prov., Doi Suthep-Pui Natl. Pk. Namtok Monthathan 700 m L-489 18°49′N 98°55′E 29.4.2003 AV, Thamasenanupap, Ferro', 3 ♂♂ 7 ♀♀; 'Chiang Mai Prov., Doi Suthep-Pui Natl. Pk., Huai Kaew at Monthanatharn 18°49′N 98°55′E, 17.5.2001 G.W. Courtney', 1 ♀ (all these paratypes in ASCI, MSNV).

Description. Total length 1.7-2.0 mm, total width 1.1-1.3 mm (holotype 1.7 × 1.1 mm). Body wide oval, feebly convex, widest in anterior third.

Head. Coloration entirely black, impunctate or with rare and faint punctures, without any trace of frontoclypeal suture and without microsculpture. Labrum black, anterior margin straight, slightly notched medially. Periocular groove and 'systematic punctures' indistinct. Eyes oblong, oblique, closest to each other anteriorly, not protruding; postocular portion of tempora small; maximum eye diameter nearly equal to interocular space in frontal view. Prementum with long black setae. Mentum trapezoid, microgranulate, nearly in one plane. Submentum and gula smooth and shining, with sparse large punctures. Gular sutures converging posteriorly. Maxillary palpi yellow-brown; palpomere 1 thin and short, palpomeres 2 and 3 nearly equal in length, dilated at apex, palpomere 4 elongate, nearly twice as long as palpomere 3, asymmetrical, outer margin straight and inner margin convex. Eight antennomeres.

Thorax. Pronotum transverse, 0.42 times as long as wide, black with yellowish-brown lateral margins, the latter wider posteriorly; smooth as head, without microsculpture, except some sparse and faint punctures. Prosternum black, with longitudinal keel. Scutellar shield equilateral, black, without punctures. Mesoventrite with simple longitudinal keel. Elytra ca 0.9 times as long as wide, black with yellowish-brown margins and apex; with 10 longitudinal

rows of setiferous, more impressed punctures alternating with 10 rows (interstriae) of more sparse and fainter punctures; parasutural furrow covering nearly posterior two thirds of elytra. Epipleura black, nearly horizontal. Pseudepipleura yellowish, nearly vertical, wider than epipleura. Metaventrite setiferous with median longitudinal glabrous area posteriorly.

Legs. Fore coxae granulate; fore femora granulate and setiferous on basal half, smooth distally, with tibial groove; fore tibiae smooth, without longitudinal grooves. Middle femora with tibial grooves; ventral side of middle tibiae with sulcus between two longitudinal ridges. Hind trochanters smooth and shining; hind femora with scarce punctures and tibial grooves; hind tibiae curved, ventral side with longitudinal sulcus between two ridges.

Abdomen. Ventrites 1-6 smooth, with lateral setae.

Male genitalia. Aedeagus (Figs. 36-38) nearly 0.25 times as long as body; parameres nearly as long as phallobase; apex of median lobe nearly at level of apex of parameres.

Differential diagnosis. *Laccobius shorti* sp. nov. belongs to the group of species with longitudinal rows of elytral punctures and curved hind tibiae. It differs from *L. celsus*, *L. munus*, and *L. sharmai* by the small size and uniformly dark elytral surface (excluding lateral borders and apex) without longitudinal furrows but with long setae on the punctures of the primary rows. Apical portion of parameres is neither swollen (in contrast to *L. celsus*) nor excised medially (in contrast to *L. munus*) nor slightly concave externally (in contrast to *L. sharmai*). It differs from *L. silvester* sp. nov. by having a comparatively broader aedeagus with parameres as long as the basal segment (parameres longer than the basal segment in *L. silvester* sp. nov.).

Etymology. It is a great pleasure to dedicate this new species to Andrew Short, a specialist in the Hydrophilidae.

Distribution. Thailand.

Laccobius (*Glyptolaccobius*) *silvester* sp. nov.

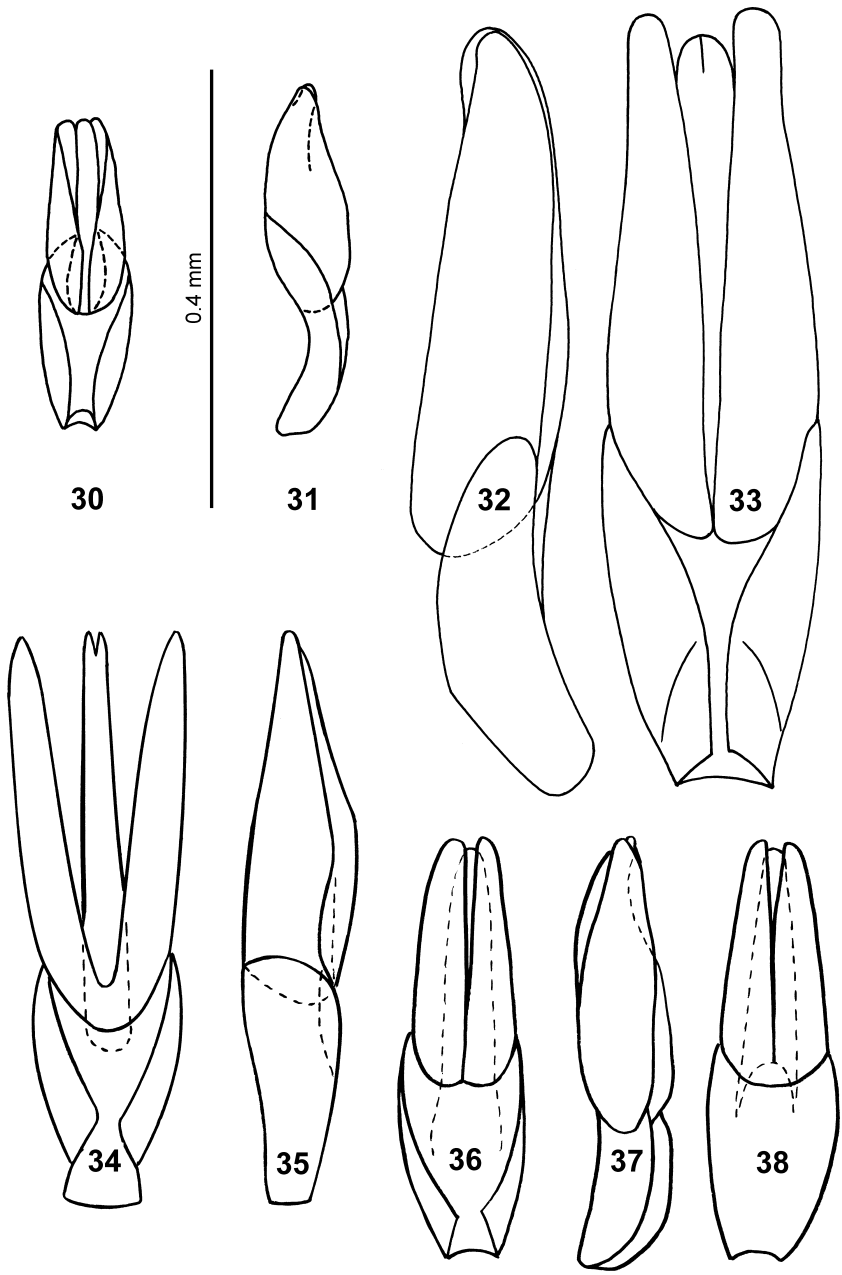
(Figs. 34-35)

Type locality. India, Uttar Anchal, W Loharket Village, 30 km N Bageshwar, 1800-1900 m a.s.l.

Type material. HOLOTYPE: 1 ♂, 2.2 × 1.2 mm (NHMW): 'INDIA: Uttaranchal / 30 km N Bageshwar / W Loharket [village] // 1800-1900 m. / 24.VI.2003; leg. Z. / Kejval & M. Tryzna'.

Description. Small-sized species (holotype 2.2 mm long and 1.2 mm wide). Body oval, moderately convex, its outline not interrupted between pronotum and elytra; elytra not explanate.

Head. Labrum of males without specula; trapezoidal in dorsal view, with straight anterior and posterior margins and feebly oblique sides, shiny black. Clypeus moderately convex, not deflexed towards margins, shiny black, with sparse and faint punctures, without distinct 'systematic punctures'. Eyes oblique, weakly convex, not protruding, separated by slightly more than two times width of one eye, nearly reniform in lateral view, emarginate posteriorly. Maxillary palpi less than 0.5 times as long as head wide; palpomere 2 not swollen, narrower and nearly as long as palpomere 3; palpomere 4 1.5 times as long as palpomere 3, outer margin nearly straight, inner margin rounded, with truncate apex. Mentum ca 0.5 times as wide as long, almost flat, at least in centre, covered with faint punctures. Eight antennomeres; scape (antennomere 1) longer than three following antennomeres together; pedicel (antennomere 2) cone-shaped; two intermediate antennomeres (3-4) very short; cupule (antennomere 5) asymmetrical, oval in ventral view, crescent-shaped and emarginate in dorsal



Figs. 30-38. 30-31 – *Laccobius senguptai* Gentili, 1979, holotype. 30 – aedeagus, dorsal view; 31 – ditto, lateral view. 32-33 – *L. sharmai* Gentili, 1995, holotype. 32 – aedeagus, dorsal view; 33 – ditto, lateral view. 34-35 – *L. silvester* sp. nov., holotype. 34 – aedeagus, dorsal view; 35 – ditto, lateral view. 36-38 – *L. shorti* sp. nov. 36 – holotype, aedeagus, dorsal view; 37 – paratype from Chiang Mai, aedeagus, lateral view; 38 – holotype, ventral view.

view; club with segments 1 and 3 nearly equal in length, segment 1 more stout, segment 2 shorter and narrower.

Thorax. Pronotum without distinct 'systematic punctures' but covered with sparse and faint punctation; smooth and shining; black in centre and along anterior and posterior margins, yellow coloration of lateral margins widening posteriorly. Prosternum well developed, tectiform medially and with fine, clearly traced median carina. Scutellum black, equilateral. Mesoventrite reaching anterior mesothoracic margin at single point, rather flat except for median carina, the latter more raised anteriorly and forming small acute tooth slightly anterior of middle coxae. Metaventrite with rather weakly raised middle portion, the latter slightly projecting anteriorly between middle coxae, with hydrofuge pubescence except for posteromedian glabrous area on raised middle portion. Anepisternum 3 ca 4.5 times as long as wide, subparallel. Elytra with complete parasutural furrow and ca 20 longitudinal series of punctures: ten primary rows of well discernible setigerous punctures, and ten alternate, scarcely visible rows; lateral margins neither serrate nor denticulate; epipleura oblique, pseudepipleura nearly vertical and separated by distinct ridge consisting of small arcs; their anterior dilated portion ending before hind coxae.

Legs. Fore coxae almost contiguous, fore trochanters pubescent; middle coxae separated by median carina of mesoventrite; tip of hind trochanters free, not abutted to hind femora. Femora with distinct tibial grooves distally on inner faces; basal third of ventral side of fore femora covered with hydrofuge pubescence; middle and hind femora nearly glabrous. Tibiae relatively short and stout, progressively wider towards apices, spiny (ventral face with three longitudinal rows of stiff setae, apices with two long spurs), without swimming hairs; hind tibiae curved inwards. Fore tarsomeres 2 and 3 expanded in males. Middle and hind tarsi with fine and sparse swimming hairs on dorsal face; hind tarsomere 1 much shorter than tarsomere 2. Claws of moderate size, robust, weakly curved.

Abdomen. Six distinct ventrites, ventrites 1-5 rather shiny and sparsely pubescent, ventrite 6 more dull, densely pubescent and somewhat retractable; ventrite 1 not carinate; posterior margin of ventrite 5 subtruncate.

Male genitalia. Median lobe slender, straight, excised at apex; parameres nearly as long as median lobe and slightly longer than phallobase (Figs. 34-35).

Differential diagnosis. *Laccobius silvester* sp. nov. pertains to the group of *Glyptolaccobius* species with curved hind tibiae and elytra with longitudinal rows of punctures. Within the group it differs from *L. celsus* and *L. munus* by the lack of sulciform punctural rows, from *L. sharmai* by the lack of yellowish dots and stripes near the elytral base and suture, and from *L. shorti* sp. nov. by the parameres nearly as long as phallobase.

Etymology. The mountain zones of Uttar Anchal are rich of luxuriant forests.

Distribution. India (Uttar Anchal).

Acknowledgements

I am grateful to Andrew E. Z. Short (Ithaca, New York), Franz Hebauer (Grafling, Germany), and Manfred A. Jäch (Naturhistorisches Museum, Wien) for providing interesting specimens from Bhutan, India, Nepal and Thailand, to Martin Fikáček, Andrew E. Z. Short and Albrecht Komarek for critical revision of the text, to David S. Boukal for his revision of the English language; and to Vittorio Pieroni and Manuela Caccia for preparing the drawings.

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