

# HYDROPHILIDAE:

## 3. The genus *Laccobius* ERICHSON in China and neighbouring areas (Coleoptera)

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### Abstract

General information about the Hydrophilid genus *Laccobius* ERICHSON is provided. A systematic approach to the Chinese members of the genus is attempted. In China and its vicinity 6 subgenera and 51 species presently are known; 7 new species are described: *Laccobius munus* (Nepal), *L. sharmai* (Nepal), *L. egregius* (India, Uttar Pradesh), *L. inermis* (India, Uttar Pradesh), *L. almoranus* (India, Uttar Pradesh), *L. fuscus* (India, Uttar Pradesh), *L. globulus* (India, Uttar Pradesh). *Laccobius nanulus* ROTTEMBERG is established as a new synonym of *L. biguttatus* GERHARDT. A lectotype is designated for *L. biguttatus*. Each species is figured. Keys for determination and data on the geography and ecology are provided.

**Key words:** Hydrophilidae, *Laccobius*, China, new species, key, lectotype designation, new synonym

### Introduction

This paper deals with the Chinese species of *Laccobius* ERICHSON (Coleoptera, Hydrophilidae) known and with those of the surrounding states, namely North Korea, Russia (Primorsky Krai, Amur Province, Evrei Okrug, Cita Province, Gorno-Altaj Republic), Mongolia, Kazakhstan (Oriental Kazakhstan, Semipalatinsk, Alma Ata), Kirgizstan, Tadzhikistan (Gorno-Badakhshan), Afghanistan (Badakhshan), Pakistan (Azad Kashmir), India (Kashmir, Himachal Pradesh, Uttar Pradesh, Sikkim, Assam, Arunachal Pradesh), Nepal, Bhutan, Burma (Shan, Kachin), Laos, Vietnam (northern Vietnam, formerly Tonkin).

D'ORCHYMONT (1935) cites only 7 species from China, PU (1981) only 2 from Tibet, while SHATROVSKIY (1984) cites 30 species from the former "Soviet Union". Presently 21 species are known from China and 30 from the surrounding areas; an additional species, *L. discicollis* RÉGIMBART was recorded from "Indochina" by ZAITZEV (1908b), however, this species is so far known only from South India and Sri Lanka and the "Indochina" record is very doubtful; 7 new species are described herein. More will certainly be discovered in the course of the "China Water Beetle Survey".

The aim of this work is to provide keys for the Chinese species of *Laccobius*, to specify their synonyms and type specimens, to review their ecology and distribution, and to provide biological data and a bibliography concerning these subjects.

### Acronyms and CWBS localities

BMI	Bishop Museum, Honolulu
CASB	Chinese Academy of Sciences, Zoological Institute, Beijing
CASS	Chinese Academy of Sciences, Institute of Applied Ecology, Shenyang
CFHD	Collection Franz Hebauer, Deggendorf

CMSN	Collection Masataka Satô, Nagoya
CNCO	Canadian National Collection, Biosystematics Research Centre, Ottawa
CTN	Collection Takehiko Nakane, Japan
CWBS	China Water Beetle Survey
FMC	Field Museum of Natural History, Chicago
HNHM	Hungarian Natural History Museum, Budapest
IMC	Indian Museum, Calcutta
IPEF	Institut für Pflanzenschutzforschung, Eberswalde-Finow
ISNB	Institut royal des Sciences naturelles de Belgique, Brussels
IZUL	Institute of Zoology of the University, Lund
MHNG	Muséum d'Histoire naturelle, Geneva
MHNP	Muséum National d'Histoire naturelle, Paris
MSNM	Museo Civico di Storia Naturale, Milan
MSNV	Museo Civico di Storia Naturale, Verona
MZC	Zoologisk Museum, Copenhagen
NHMB	Naturhistorisches Museum, Basel
NHML	The Natural History Museum, London
NHRS	Naturhistoriska Riksmuseet, Stockholm
NMP	Národní Muzeum, Prague
NMW	Naturhistorisches Museum, Vienna
NSMT	National Science Museum, Tokyo
NTU	National Taiwan University, Taipei, Republic of China
USNM	United States National Museum (Smithsonian Institution), Washington
ZIL	Academy of Sciences, Zoological Institute, St. Petersburg
ZMH	Universitetes Zoologiska Museum, Helsingfors
ZMUB	Zoologisches Museum der Humboldt Universität, Berlin
ZMUC	Zoological Museum, University of Cambridge
ZMUM	Museum of Zoology, Moscow University, Moscow

CWBS loc. 9: **Beijing Municipality**; Ming Tombs; small, unshaded rain puddles; 1.VII.1992; leg. Jäch

CWBS loc. 10: **Beijing Municipality**; Xiang Shan (Fragrant Hills), ca. 35 km NW Beijing City; small stream (epirhitron), flowing through forest; 2.VII.1992; leg. Jäch & Ji

CWBS loc. 14: **Yünnan Province**; Dali Autonomous Prefecture; Weishan County; Weibao Shan, 60 km S Xiaguan City and 12 km S Weishan City; pool in a small, shaded, unpolluted stream, 2500 - 3000 m a.s.l.; 1. - 17.VII.1993; leg. Ji

CWBS loc. 15: **Yünnan Province**; Dali Autonomous Prefecture; Weishan County; Weibao Shan, 60 km S Xiaguan City and 12 km S Weishan City; small, ca. 1 m deep, man made rain water pool, unshaded, unpolluted, 2500 - 3000 m a.s.l.; 1. - 17.VII.1993; leg. Ji

CWBS loc. 20: **Hunan Province**; Xiangxi Prefecture; Dayong County; Zhangjiajie Forest National Park, Suoxiyü Nature Reserve, Wulingyüan section (ca. 30 km N Dayong City); Pipa Xi ('Chinese Lute' River), ca. 2 - 3 m wide, shaded, very shallow, sometimes even vanishing beneath the gravel of sandstone and occasional limestone, ca. 650 m a.s.l.; 29.X.1993; leg. Schönmann, Schillhammer & Ji

CWBS loc. 21: **Hunan Province**; Xiangxi Prefecture; Dayong County; Zhangjiajie Forest National Park, Suoxiyü Nature Reserve, Wulingyüan section (ca. 30 km N Dayong City); small, right side tributary of Pipa Xi, short steep stretch with small waterfalls and big boulders, accumulations of decaying plant material, rocks partly covered with moss, shaded, ca. 650 m a.s.l.; 29.X.1993; leg. Schönmann, Schillhammer & Ji

CWBS loc. 23: **Hunan Province**; Xiangxi Prefecture; Dayong County; Zhangjiajie Forest National Park, Suoxiyü Nature Reserve, Wulingyüan section (ca. 30 km N Dayong City); ca. 2 km downstream Shuiraosimen; small

branch of Jinbian Xi, ca. 1 - 2 m wide, slowly flowing, with riffle areas and pools; 30.X.1993; leg. Schönmann, Schillhammer & Ji

- CWBS loc. 24: **Hunan Province**; Xiangxi Prefecture; Dayong County; Zhangjiajie Forest National Park, Suoxiyü Nature Reserve, Wulingyuan section (ca. 30 km N Dayong City); ca. 3 km upstream Suoxiyü City; Suo Xi (river), furcation area in a wide riverbed (50 - 100 m), river divided into several, ca. 2 - 5 m wide streamlets, sandstone and little limestone, ca. 400 m a.s.l.; 31.X.1993; leg. Schönmann, Schillhammer & Ji
- CWBS loc. 76: **Jilin Province**; Yanbian Korean Autonomous Prefecture; Antu County; Changbai Shan Biosphere Reserve; 6 km W Baihe City; Toudao Bai He (= 1st White River), ca. 20 m wide, basalt, 600 m a.s.l.; 17.VIII.1994; leg. Jäch, Ji & Wang
- CWBS loc. 77: **Jilin Province**; Yanbian Korean Autonomous Prefecture; Antu County; Changbai Shan Biosphere Reserve; springfed pool, ca. 50 m from loc. 76, unshaded; 17.VIII.1994; leg. Jäch, Ji & Wang
- CWBS loc. 79: **Jilin Province**; Yanbian Korean Autonomous Prefecture; Antu County; Changbai Shan Biosphere Reserve; near Hongsi Forest Station, ca. 30 km NE Baihe City; shallow pool with muddy edges; 17.VIII.1994; leg. Jäch, Ji & Wang
- CWBS loc. 81: **Jilin Province**; Yanbian Korean Autonomous Prefecture; Antu County; Changbai Shan Biosphere Reserve; near Baihe City; Erdao Bai He, below the power plant dam, ca. 4 m wide, degraded primary forest, ca. 650 m a.s.l.; 17.VIII.1994; leg. Jäch, Ji & Wang
- CWBS loc. 83: **Jilin Province**; Yanbian Korean Autonomous Prefecture; Antu County; Changbai Shan Biosphere Reserve; ca. 80 km SE Baihe City; ca. 80 km SE Baihe City; near Yüan Chi (Round Lake); shallow, unshaded roadside rain pools; 18.VIII.1994; leg. Jäch, Ji & Wang
- CWBS loc. 88: **Jilin Province**; Yanbian Korean Autonomous Prefecture; Antu County; Changbai Shan Biosphere Reserve; ca. 10 km SE Baihe City; roadside pool, unshaded, ca. 50 cm deep; 18.VIII.1994; leg. Jäch
- CWBS loc. 89: **Jilin Province**; Yanbian Korean Autonomous Prefecture; Antu County; Baihe City, Baohujü District; surroundings of Changbai Mountain Research Station, along the road to Changbai Mountain; unshaded roadside pools, ca. 750 m a.s.l.; 19.VIII.1994; leg. Jäch
- CWBS loc. 90: **Jilin Province**; Yanbian Korean Autonomous Prefecture; Antu County; Baihe City, Baohujü District; near Power Plant of Baihe City; forest pool, obviously springfed, rich in decaying organic matter, in primary forest, cool water, ca. 750 m a.s.l.; 19.VIII.1994; leg. Jäch
- CWBS loc. 93: **Jilin Province**; Yanbian Korean Autonomous Prefecture; Antu County; Baihe City, Baohujü District; near Power Plant of Baihe City, near loc. 90; unshaded, springfed pools, cold water, ca. 750 m a.s.l.; 19.VIII.1994; leg. Jäch
- CWBS loc. 94: **Jilin Province**; Yanbian Korean Autonomous Prefecture; Antu County; Changbai Shan Biosphere Reserve; ca. 62 km N Baihe City; hot spring, 1 km below the waterfall, temperature varying between 10°C - 50°C within a few centimeters, ca. 1800 m a.s.l.; 20.VIII.1994; leg. Jäch, Ji & Wang
- CWBS loc. 95: **Jilin Province**; Yanbian Korean Autonomous Prefecture; Antu County; Changbai Shan Biosphere Reserve; ca. 62 km N Baihe City; Erdao Bai He, including pools on gravel bank, ca. 1750 m a.s.l.; 20.VIII.1994; leg. Jäch, Ji & Wang
- CWBS loc. 96: **Liaoning Province**; Jinzhou City Region; Beizhen County; Yiwulü Shan; ca. 5 km NW Beizhen City (= Guaning); Toudao Gou He (= 1st Valley River), 2 - 5 m wide, only partly shaded, flowing through Chinese Pine (*Pinus tabulaeformis*) forest, strongly washed out due to heavy spates which occurred 2 weeks before, ca. 200 m a.s.l.; 22.VIII.1994; leg. Jäch, Ji & Wang
- CWBS loc. 98: **Liaoning Province**; Jinzhou City Region; Beizhen County; Yiwulü Shan, ca. 17 km NW Beizhen City; Sandao Gou He, where it enters the plain, 10 m wide, granite, including small pools on the gravel bank, ca. 150 m a.s.l.; 23.VIII.1994; leg. Jäch, Ji & Wang

CWBS loc. 99: **Liaoning Province**; Jinzhou City Region; Beizhen County; Yiwulü Shan, ca. 17 km NW Beizhen City; Sandao Gou He near loc. 98; several shallow pools, rain water or ground water, unshaded, mud, sand; 23.VIII.1994; leg. Jäch, Ji & Wang

CWBS loc. 100: **Liaoning Province**; Jinzhou City Region; Beizhen County; Yiwulü Shan, ca. 10 km W Beizhen City; Erdao Gou He (2nd Valley River), ca. 20 m wide, unshaded, slowly flowing through plain, shallow, sandy bottom and margin; 23.VIII.1994; leg. Jäch, Ji & Wang

### Life History

Various items concerning biology and life history are summarized, chiefly the results of studies and observations carried out by CHEARY (1971), mainly on rearing specimens of American *Laccobius ellipticus* LE CONTE, *L. carri* d'ORCHYMONT and *L. borealis* CHEARY. YANG (1994) has only the annotation: "piercers - herbivors".

Most adults of *Laccobius* live in shallow water, littoral sand and damp places. They inhabit various kinds of standing bodies of fresh water, but some occur also in salt or brackish water: *L. decorus* (GYLLENHAL), some individuals of *L. minutus* (L.) and *L. biguttatus* GERHARDT; or in rapidly flowing streams: *L. striatulus* (F.), *L. simulans* d'ORCHYMONT, *L. oscillans* SHARP; occasionally specimens were collected in litter composed of moist leaves (*L. oscillans* SHARP). Many species prefer cold water, but some occur in thermal sources: the European *L. thermarius* TOURNIER, the North American *L. bruesi* CHEARY.

Adults feed on detritus, small algae and micro-organisms such as diatoms etc.; the detritus appears to be swept into the oral cavity by the maxillae, where the food is ground between the flat grinding inner surfaces of the mandibles.

Adult *Laccobius* are air breathers; therefore periodically they must reach the atmosphere to refresh their air supply. Their antennal club is fringed with hair acting as if they were hydrophilic on one side and hydrofugic on the other. On reaching the water surface the fringe of hair is spread outwards by the surface tension and the air space within is put into contact with the atmosphere. One or both antennae are raised with the unwettable part of the club in contact with the film of air on the hydrofugic pubescence behind the eye. As the top of the antenna reaches the surface, the surface film breaks to form a funnel. The beetle turns a little sideways, and the air is drawn in around the prothorax and an airbubble is formed on the undersides of the beetle and under the elytra. Inhalation is believed to occur chiefly through the mesothoracic spiracles and exhalation by the abdominal spiracles. Besides retaining a film of air around the spiracles, the air bubble is thought to serve an important hydrostatic function, enabling the insect to rise to the surface to renew its air supply. The bubble constitutes an oxygen reserve; and serves as a "physical gill", separating the oxygen dissolved in the water by diffusion. Probably the hydrofugic abdominal pubescence acts as a "plastron" for air storage.

The swimming movements resemble those of *Hydrophilus*, studied by HUGHES (1958). He used movie cameras to film the beetles while they swam freely above a glass plate marked with a grid. He found that retraction of a hind leg is simultaneous with that of the controlateral middle leg. The movement is rectilinear, but the head rotates a little to the side opposite that on which the hindleg is retracting.

The adults fly and are attracted by light, mainly ultraviolet light. Dispersal flights were observed by FERNANDO (1958) in Ceylon and CHEARY (1971) in the USA during periods of high humidity; all these specimens were teneral and sexually immature, probably newly emerged adults.

The eggs are laid in silken cocoons, provided with breathing tubes: the bowl containing the eggs is placed below the water line and the stalk is usually attached to a rock or emergent vegetation, protruding a little above the water line. The numbers of eggs per case varies from two to eleven.

Once it has hatched from the egg, the first larva chews an exit hole through the latero-ventral side of the egg case. Once the first larva hatches, the others usually follow in short order. They resemble those of the genus *Berosus* LEACH, being air breathers and metapneustic. Respiration takes place through the terminal tracheae or stigmatic atrium.

CHEARY (1971) observed that larvae of *Laccobius* are predaceous; they feed on Chironomid larvae or pupae, ingesting their blood and tissues. The prey is grasped by means of the mandibular teeth and held out of the water body. Extra-intestinal digestion takes place; the *Laccobius* larva siphons out the body fluids and tissues of the Chironomid larva until nothing is left but the cuticle and head capsule.

Two larval moults have been observed. When moulting, larvae suspend themselves from the surface film by their float hair. There is a dorsal, longitudinal splitting of the cuticle and the next instar emerges and swims to the bottom leaving the cast skin suspended from the surface film. Just prior to pupation the larvae begin to emerge from the water; pupation takes place for 4 - 5 days in dry or preferably moist earth 1 - 3 feet from the water's edge in a chamber. Starting with the time of copulation, the *Laccobius* life cycle takes from seven to eight weeks under laboratory conditions.

Reproduction is gonochoristic. According to CHEARY (1971), the copulating male usually climbs halfway up the elytra of the female, attaches himself by using the tarsal pads, and inserts his aedeagus. Should the female move away whilst they are coupling, the male releases his hold on the female and immediately attaches himself to some form of anchor such as a rock. Copulation takes place under water, and the female often swims away dragging the male behind her, unless he has had time to make use of its tarsal pads to anchor them.

The method of attraction between males and females has not been established. Stress sounds were recorded by VAN TASSEL (1966) for two species of *Laccobius* in the range extending from 20 cycles per second to 18 kilocycles per second. The pre-mating sounds recorded in the genus *Berosus* would suggest that members of the genus *Laccobius* may also use sounds during courtship.

The time lapse between copulation and oviposition is probably 3 to 14 days. Females secrete silk from the accessory or collateral glands, and construct egg cases with their spinnerets.

Two methods were suggested for collecting adult *Laccobius*. Following CHEARY (1971) "the easiest method is to take a wire tea-strainer, stir the mud and sand in the shallows along stream margins and scoop up the beetles when they surface to replenish their airbubbles". PERKINS (1976) found *Laccobius* adults "in moist sand and gravel of streambanks, between the streams and adjacent dry soil. They are dislodged quite readily by splashing water from the stream or pond onto the shore, using the hand as a scoop. The water flows back down onto the stream or pond, washing the beetles off the substratum and out onto the surface of the water. The ventral surface of these beetles has a hydrofuge pubescence which holds a bubble of air used in respiration. This bubble causes the beetle to float upon the surface of the stream and, since the beetle cannot swim, permits its easy collection".

## Genus *Laccobius* ERICHSON, 1837

ERICHSON 1837: 202; ZAITZEV 1908b: 391; KNISCH 1924a: 183-192; d'ORCHYMONT 1935b: 206-209; PU 1957: 66; CHEARY 1971: 1-70; GENTILI & CHIESA 1975: 6-28; HANSEN 1991: 136-140; YANG 1994: 367-372. *Brachypalpus* CASTLENAU, 1840: 56. *Hydroxenus* WOLLASTON, 1867: 40. *Notoberosus* BLACKBURN, 1895: 30. *Yateberosus* SATO, 1966: 5.

Following HANSEN (1991) *Laccobius* belongs to the subfamily Hydrophilinae, tribe Oocyclini. The main features characterizing this genus among the related genera are as follows: abdomen with 6 distinct ventrites; posterior trochanters not completely abutted to the femur, but with projecting

apex; scutellum nearly equilateral; maxillary palpi not longer than half of width of head; male foretarsi with 2 broadened segments.

More than 190 species are known, distributed in all zoogeographical regions, except the Neotropics. China includes two regions, the Palaearctic and the Oriental. The Chinese *Laccobius* belong to 6 subgenera, 3 mainly Palaearctic (*Laccobius* ERICHSON s. str., *Compsolaccobius* GANGLBAUER, *Dimorpholaccobius* ZAITZEV), 2 mainly Oriental (*Glyptolaccobius* GENTILI, *Cyclolaccobius* GENTILI) and 1 from both regions (*Microlaccobius* GENTILI).

### Taxonomy and distribution

For the specific determination of adult *Laccobius* firstly it is expedient to state a major subdivision in subgenera. Characters of use for this are ocular shape and size; presence or absence of a parasutural stria; pattern of the mesosternal keel; shape (straight or curved) of hind tibiae; and the nature of the elytral punctation. Other characters are of lesser importance: presence and size of pale preocellar spots on the front; shape of dark pronotal spots; morphology of claws; body shape; surface structures such as the presence of shagreening, striae, etc., and coloration. Male characters are also used: genital structure; in several instances the shape and size of a pair of suckers (Latin: speculum, plural: specula) on the labrum; the presence and density of setose hairs on the midfemur.

### Key to subgenera of *Laccobius*

- A Eyes, in dorsal view, transverse, reniform or oblique (fig. 1) .....B  
 A' Eyes, in dorsal view, nearly circular or slightly oval (figs. 2 - 4).....C  
 B A parasutural furrow is detectable (fig. 5). Elytral epipleura often thin as in *Anacaenini* .....  
 .....A. *Glyptolaccobius* GENTILI  
 B' Parasutural furrow lacking.....B. *Cyclolaccobius* GENTILI  
 C Hind tibiae straight or nearly straight ..... D  
 C' Hind tibiae evidently curved..... E  
 D Elytral epipleuron wide almost to the elytral apex (fig. 6) ..... [C. *Yateberosus* SATÔ]  
 D' Elytral epipleuron wide almost to the metasternum (fig. 7) ..... [D. *Notoberosus* BLACKBURN]  
 E Elytral punctures all scattered (fig. 10) or elytra with 3 - 5 longitudinal striae of dense and minute punctures..... [E. *Hydroxenus* WOLLASTON]  
 E' Elytral punctures arranged in about 20 longitudinal rows (figs. 11 - 13)..... F  
 F Mesosternal keel provided with two lateral spurs (fig. 8). Larger punctures scattered between elytral rows of small punctures and never forming full rows; sometimes punctures not differing much from each other in size (fig. 13)..... F. *Dimorpholaccobius* ZAITZEV  
 F' Mesosternal keel normally without lateral spurs (fig. 9), sometimes with a central swelling; elytral punctation in a different pattern (figs. 11, 12) ..... G  
 G Greatest width of pronotum in middle, its hind angles broadly rounded (fig. 14). Mesosternal keel decreasing anteriorly forming obtuse angle, and provided with a minute denticle (fig. 15). Claws long and straight (fig. 18)..... G. *Compsolaccobius* GANGLBAUER  
 G' Greatest width of pronotum at base, its hind angles rounded at tip. Mesosternal keel decreasing anteriorly forming a right angle, and provided with a large tooth (figs. 16 - 17). Claws usually evenly curved (figs. 19 - 22)..... H  
 H All elytral punctures alike; large, with almost equally broad intervals. Rows straight, more rarely slightly confused near scutellum and apex (fig. 11); occasional punctures sometimes out-of-line ..... H. *Laccobius* s. str. ERICHSON

- II' Elytral punctures of 2 sizes, large and small. If the size difference is weakly developed, some punctures are distinctly interseriate. Rows broken, or alternate between rows of small and large punctures (fig. 12)..... 1. *Microlaccobius* GENTILI

### A. Subgenus *Glyptolaccobius* GENTILI, 1989

GENTILI 1989: 36; HANSEN 1991: 291.

Type species: *Laccobius affinis* KNISCH, 1927, by original designation.

Five described species belong to this subgenus; 4 from China and neighbouring countries. Two new species from the Himalayas are described herein.

#### Key to the species of the subgenus *Glyptolaccobius*

- |    |   |                           |
|----|---|---------------------------|
| 1  | Elytra shining, with longitudinal rows of punctures .....   | 2                         |
| 1' | Elytra pubescent, with scattered punctures .....  | 4                         |
| 2  | The rows of punctures are sulciform on the whole elytra. Postlabium rugose. Parameres swelling at apices (figs. 23 - 25). 2.4 - 2.6 mm .....                    | 1. <i>celsus</i> GENTILI  |
| 2' | Rows of punctures sulciform only near suture. Parameres not swelling at apices .....  | 3                         |
| 3  | Postlabium smooth. Parasutural sulci nearly as long as one half of elytra. Median lobe rod-like, parameres broad (figs. 26 - 29). 1.9 - 2.2 mm .....            | 2. <i>munus</i> sp.n.     |
| 3' | Postlabium granulated. Parasutural sulci nearly as long as one third of elytra. Median lobe broader than parameres (figs. 30 - 31). 2.0 - 2.15 mm .....         | 3. <i>sharmai</i> sp.n.   |
| 4  | Pale stripes and dots on elytra. Parasutural furrow shorter. Aedeagus as in figs. 32 - 34. 1.7 - 2.0 mm .....   | 4. <i>jaechi</i> GENTILI  |
| 4' | Elytra of the same colour. Parasutural furrow longer (fig. 5) .....   | 5                         |
| 5  | Parasutural furrow not reaching elytral apex. Parameres with a longitudinal incision before apices (figs. 35 - 38). 1.8 mm .....                                | 5. <i>egregius</i> sp.n.  |
| 5' | Parasutural furrow reaching elytral apex. Parameres without longitudinal incision .....   | 6                         |
| 6  | Mesosternal keel posteriorly expanded, anteriorly simply toothed. Parameres hooked at tips; median lobe not excised at apex (figs. 39 - 41). 1.8 - 2.1 mm ..... | 6. <i>incisus</i> GENTILI |
| 6' | Mesosternal keel anteriorly sagittate. Parameres simple; median lobe excised at apex (figs. 42 - 43). 1.7 - 2.0 mm .....  | 7. <i>affinis</i> KNISCH  |

#### 1. *Laccobius (Glyptolaccobius) celsus* GENTILI, 1989 (figs. 23 - 25)

GENTILI 1989: 36-37 (Nepal, Karnali, nr. Jumla, Chautha-Bhulbule 2850 - 3270 m, holotype NSMT).

Distribution: NEPAL, type locality; Karnali, Jumla District, Neurgar 2800 m (GENTILI 1989).

#### 2. *Laccobius (Glyptolaccobius) munus* sp.n. (figs. 26 - 29)

**Holotype** ♂ (MHNG): "NEPAL (Prov. Bagmati) below Tarke Ghyang 2200 m, 19.IV.81 LÖBL & SMETANA".  
**Paratypes:** 1 ♂, same data (CFHD); 1 ♂, "NEPAL (Prov. Bagmati) Malemchi 2800 m, 16.IV.81 LÖBL & SMETANA" (MSNV).

**Description:** Length 1.9 - 2.2 mm (holotype 2.05 mm); width 1.2 - 1.3 mm (holotype 1.3 mm). Oval, very convex. Upper side shining black with yellowish patches. Head shining black, with sparse minute punctures; in dorsal view, eyes oblique and interocular space scarcely larger than an eye. Pronotum shining black with yellowish sides; punctures as on head. Elytra black, with yellow-white dots near base, at third of length and near apex; borders and apex yellowish.

Parasutural sulci on hind elytral half; 2 - 3 rows near suture also sulciform in part; rows of punctures alternately more and less regular. Underside black. Labium in centre with a feeble hollow. Postlabium flat, shagreened at 100 x, without punctures. Prosternum tectiform, with longitudinal keel. Mesosternal keel with an anterior tooth and lateral spurs. Metasternum pubescent except along the central line. First abdominal sternum small, provided with a central jut. The two apical segments of maxillary palpi swollen; antennal club rounded at tip; legs short and stout, mid- and hind femora glabrous, tibiae with thorns mainly near apex, hind tibiae hardly curved, claws short and strong. Elytral epipleura anteriorly thin as in *Anacaena*. Aedeagus nearly 1/3 of body length, medium lobe rod-like, parameres longer and broader, tegmen almost as long as parameres (figs. 26 - 29).

Discussion: Near *L. celsus*, both having longitudinal rows of punctures; but smaller, with a smooth postlabium and a different aedeagus (e.g. parameres without expanded apices).

### 3. *Laccobius (Glyptolaccobius) sharmai* sp.n. (figs. 30 - 31)

**Holotype** ♂ (NMW): "E Nepal: Solukhumbu, Surka La Pass 2875 m, Karka Khola, 5.4.1994, leg. S. SHARMA (109)".  
**Paratypes**: 1 ♀ (MSNV): "E Nepal: Solukhumbu, Kharte, Kharte Khola, 2.4.1994, 2540 m. leg. S. SHARMA (105)";  
 1 ♂ (MSNV) 1 ♀ (NMW): "E Nepal: 5.4.1994; Solukhumbu, Rato Bani, Karka Khola, leg. Moog et al."

Description: Length 2.00 - 2.15 (holotype) mm; width 1,4 mm. Broadly oval, very convex. Upperside blackish, with yellowish patches and stripes. Head as long as pronotum, black, vertex with minute punctures; eyes large, posteriorly reniform, oblique; in dorsal view interocular space wider than both eyes together. Pronotum black with yellowish sides; punctures sparse and faint. Scutellum black, nearly equilateral. Elytra testaceous-blackish, with yellowish dots and stripes on the whole surface, and yellowish borders and apex. Parasutural sulci only on hind elytral third; nearly 20 longitudinal rows of faint punctures, not regularly set along the rows. Underside dark. Labium with a central hollow. Postlabium granulated, with some setae raised between granulations. Prosternum tectiform with a longitudinal keel. Mesoternum with a keel anteriorly T-shaped. Metasternum pubescent with a central glabrous area. First sternum narrow, anteriorly with a median process. Antennae, palpi and legs as in *L. munus* sp.n. Aedeagus nearly one third of body length, median lobe broad, parameres narrower and nearly as long as median lobe; tegmen nearly as long as parameres (figs. 30 - 31).

Discussion: Very near *L. munus* sp.n., but differs in having a less shining and less black upperside, a shorter parasutural furrow, the postlabium granulated and a very different aedeagus.

### 4. *Laccobius (Glyptolaccobius) jaechi* GENTILI, 1988 (figs. 32 - 34)

GENTILI 1988: 32 (Nepal, Buth Kosi 1600 m, nr. Tatopani, Tibetan frontier N of Kathmandu, holotype NMW); 1989: 36.

Distribution: NEPAL, type locality; Tatopani N of Kathmandu, creek 1800 m (GENTILI 1988); Janakpur, Sindhu, Shivino Khola 1920 m, M. Satô 14.XI.1979, 1 ♀ (CMSN); Sagarmatha, Solukhumbu, Khari Khola 2100 m, M. Satô 7.X.1979, 1 ♀ (CMSN).

### 5. *Laccobius (Glyptolaccobius) egregius* sp.n. (figs. 35 - 38)

**Holotype** ♂ (NHML): "Gori Valley, Kumaon, India, 7000 ft. H. G. C. [= CHAMPION]". **Paratypes**: 2 ♂ ♂ and 2 ♀ ♀ (NHML, MSNV), same data; 1 ♂, "Gori R. Valley, Kumaon, India, 5000 ft." (NHML); 1 ♂, "Dhabari, C. Almora, H. G. C. X.1926" (NHML).

Description: Length 1.8 mm; width 1.1 mm. Convex, oval, blackish. Head dark, without pale preocular spots, slightly shagreened at 80 x; labium wide, posteriorly angular; eyes, in frontal view,



wide and oblique. Pronotum blackish with narrowly testaceous sides, shagreened as head, with rare punctures. Elytra blackish with narrowly testaceous sides; parasutural furrow reaching anterior 2/3 of elytral length, posteriorly vanishing before elytral apex; punctures sparse and rare as on the pronotum, giving rise to short oblique setae. Underside black. Postlabium flat and shining, trapezoidal, anteriorly wider; gula provided with central relief. Prosternum short, tectiform and keeled. Mesosternum with a short longitudinal keel with a sharp tooth. Metasternum pubescent with a triangular relief in centre. Palpi and antennae yellowish, legs reddish; penultimate article of maxillary palpi swollen; legs stout, short tarsi, claws hardly curved. Foretarsi of male moderately swollen; mid- and hind femora glabrous; hind tibiae curved. Tegmen as long as parameres; the latter longitudinally excised near tips (figs. 35 - 38). Elytral epipleura wide (but very oblique) up to the level of the hind femora, then narrow and acute.

Discussion: Near *L. incisus* and *L. affinis*, but differs from both in the parasutural furrow not reaching the elytral apex; in the light shagreen on head and pronotum; and has a quite different aedeagus. From *L. affinis* it also differs in having a simple mesosternal keel, not sagittate.

### 6. *Laccobius (Glyptolaccobius) incisus* GENTILI, 1989 (figs. 5; 39 - 41)

GENTILI 1989: 36 (East Nepal, Sagarnatha, Solukhumbu, Monjo 2800 m, holotype NSMT).

Distribution: NEPAL, type locality; INDIA, Uttar Pradesh, Central Almora, Dhabari, leg. H.G. Champion, X.1927, 1 ♂ (NHML).

### 7. *Laccobius (Glyptolaccobius) affinis* KNISCH, 1927 (figs. 42 - 43)

KNISCH 1927: 132 (India, Uttar Pradesh, Kumaon, Gori Valley 2300 m, lectotype NHML by GENTILI 1979); d'ORCHYMONT 1928: 140; GENTILI 1979b: 31; 1989: 36.

Distribution: INDIA, type locality; Uttar Pradesh, Gori River Gorge, 1800 - 3000 m (GENTILI 1979); NEPAL, Bagmati, 2200 m, leg. Löbl & Smetana, 19.IV.1981 (MHNG).

## B. Subgenus *Cyclolaccobius* GENTILI, 1991

GENTILI 1991: 381-382.

Type species: *Laccobius rectus* SHARP, 1890, by original designation.

Seventeen species from Southeast Asia, Arabia and Southeast Africa belong to this subgenus; 10 are known from China and neighbouring countries. Four new species from the Himalayas are described herein.

### Key to the species of the subgenus *Cyclolaccobius*

- |    |   |                                 |
|----|---|---------------------------------|
| 1  | Elytral punctures scattered; body length over 3 mm .....  | 2                               |
| 1' | Elytra with longitudinal rows of punctures; body length under 3 mm .....  | 3                               |
| 2  | Blackish, with convex body; head and pronotum smooth; male with specula; parameres longer than median lobe (figs. 45 - 46). 3.4 - 4.3 mm .....              | 1. <i>zugmayeri</i> KNISCH      |
| 2' | Testaceous, with depressed body; head and pronotum shagreened; male without specula; parameres shorter than median lobe (figs. 47 - 48). 3.0 - 3.2 mm ..... | 2. <i>hingstoni</i> d'ORCHYMONT |
| 3  | Primary elytral rows nearly sulciform; aedeagus as in fig. 44. 2.0 - 2.1 mm .....   | 3. <i>cribratus</i> GENTILI     |
| 3' | Primary elytral rows normal, or only rows 1 - 3 nearly sulciform .....  | 4                               |
| 4  | At least 7th elytral row sulciform; aedeagus as in figs. 49 - 51. 2.1 - 2.2mm .....   | 4. <i>inermis</i> sp.n.         |

- 4' Elytral rows normal, 7th row not sulciform ..... 5
- 5 Elytral borders and epipleura swollen at base. Aedeagus as in figs. 52 - 53. 2.0 - 2.8 mm ..... 5. *nitidus* GENTILI
- 5' Elytral base normal, without swelling ..... 6
- 6 Upper side normally rough, dull, with punctures very conspicuous at 40 x ..... 7
- 6' Upper side normally smooth, shining, with very small punctures; elytral rows of punctures scarcely detectable at 40 x ..... 10
- 7 Elytral base with a small yellow spot; upper side often with green reflection. Aedeagus as in figs. 54 - 55. 2.6 - 2.8 mm ..... 6. *regalis* KNISCH
- 7' Elytral base entirely dark; upper side without green reflection ..... 8
- 8 Upper side shagreened. Most of elytral rows consisting of punctures out-of-line, not forming straight lines. Postlabium rugose. Aedeagus as in figs. 56 - 58; median lobe nearly as long as parameres. 2.2 mm ..... 7. *almoranus* sp.n.
- 8' Upper side smooth, without shagreen. Primary elytral rows consisting of punctures regularly disposed in straight lines. Postlabium shagreened, not rugose, with detectable punctures ..... 9
- 9 Aedeagus more slender, median lobe as long and nearly as broad as parameres (figs. 59 - 61). 2.5 mm ..... 8. *fuscus* sp.n.
- 9' Aedeagus more stout, median lobe shorter and wider than parameres (figs. 62 - 63). 1.9 - 2.8 mm ..... 9. *patruelis* KNISCH
- 10 Elytral base with a small yellow spot ..... 11
- 10' Elytral base entirely dark ..... 13
- 11 Upper side often with metallic reflection. Body convex. Aedeagus as in figs. 64 - 65. 1.7 - 2.2 mm .... 10. *imperialis* KNISCH
- 11' Upper side without metallic reflection. Aedeagus different ..... 12
- 12 Less convex. Median lobe excised at apex, wider and nearly as long as parameres (figs. 66 - 67). 1.8 - 2.0 mm ..... 11. *bacchusi* GENTILI
- 12' More convex. Median lobe of aedeagus rounded at apex, narrower and shorter than parameres (figs. 68 - 70). 2.0 mm ..... 12. *globulus* sp.n.
- 13 Yellow pronotal border widening anteriorly. Elytral punctures more numerous and scattered near elytral base; base of 5th elytral row not regular. Parameres acute (figs. 71 - 73). 2.2 - 2.5 mm ... 13. *kumaonicus* GENTILI
- 13' Yellow pronotal border widening only posteriorly. Elytral punctures regularly set in rows, even near elytral base; 5th row straight. Parameres with rounded apices (figs. 74 - 75). 1.9 - 2.0 mm ... 14. *politus* GENTILI

### 1. *Laccobius (Cyclolaccobius) zugmayeri* KNISCH, 1910 (figs. 45 - 46)

KNISCH 1910: 454 ("Tibet W, Lakes Panggong 50 km N", 1 specimen, lost; neotype NMW, designated by GENTILI 1991); 1924a: 192; d'ORCHYMONT 1928: 102; 1935b: 209; 1943a: 13; GENTILI & CHIESA 1975: 89-90; PU 1981: 337; GENTILI 1989: 39; 1991: 384-386.

Distribution: CHINA, Tibet, type locality; Qinghai-Tibet Plateau (PU 1981); NEPAL, Karnali, Jumla District, Jaljalé Khola Valley 3430 m (GENTILI 1989); Jumla District, near Talphí (GENTILI 1991).

### 2. *Laccobius (Cyclolaccobius) hingstoni* d'ORCHYMONT, 1926 (figs. 47 - 48)

d'ORCHYMONT 1926: 104-106 (Tibet, "Kampa Dzong" [= Gamba, Gamba Xian, ca. 150 km SW Jiangzi Xian] 4420 m, holotype NHML); 1928: 101, 140; 1935b: 209; 1937b: 252; 1943a: 12-13; GENTILI & CHIESA 1975: 90-91;

GENTILI 1979b: 33; PU 1981: 387. *championi*: KNISCH 1927: 132-133 (India, Uttar Pradesh, N Kumaon, Sheshel 5200 m, holotype NHML; synonymy by d'ORCHYMONT 1935b).

Distribution: CHINA, type locality; Tibet, "Chushol" 4300 m (d'ORCHYMONT 1943); "Tingri" [= Dingri Xian, ca. 400 km W Lhasa] 4500 m (d'ORCHYMONT 1926); Qinghai-Tibet Plateau (PU 1981); INDIA, Uttar Pradesh, Kumaon, Sheshel 4700 m (KNISCH 1927).

### 3. *Laccobius (Cyclolaccobius) cribratus* GENTILI, 1989 (fig. 44)

GENTILI 1989: 35 (Nepal, Sagarmatha, Solukhumbu, Monjo 2800 m, holotype NSMT); 1991: 387.

Distribution: NEPAL, type locality; Tatopani, N of Kathmandu, Tibetan frontier (GENTILI 1991); INDIA, Uttar Pradesh, Central Almora, Dhabari, H. G. Champion, 1 ♀ (MSNV).

### 4. *Laccobius (Cyclolaccobius) inermis* sp.n. (figs. 49 - 51)

**Holotype** ♂ (NHML): "Gori Valley, Kumaon, India, 7000 ft, H. G. C. [= CHAMPION]". **Paratypes**: 1 ♀, same data (MSNV).

Description: Length 2.1 - 2.2 mm (holotype 2.2 mm); width 1.1 - 1.25 mm (holotype 1.25 mm). Convex, oval, black with a narrow lateral testaceous strip on elytra and pronotum. Head entirely black, shining smooth but here and there shagreened, with punctures separated by spaces nearly 3 times their breadth; eyes oblique, posteriorly reniform. Pronotum black with a narrow lateral testaceous strip, shining smooth but here and there shagreened, with punctures less numerous than on head. Scutellum black with very small punctures. Elytra black with testaceous border; nearly twenty longitudinal rows of punctures, very conspicuous at 40 x, alternately more and less regular, more and less punctate; some primary rows are sulciform, even the seventh. Underside black, with elytral epipleura and legs testaceous-reddish. Postlabium flat, shagreened and slightly punctate; prosternum tectiform with longitudinal keel; mesosternum with a keel anteriorly V-shaped and posteriorly elevated in a minute tooth; metasternum pubescent with a central relief widely glabrous on the midline. Profemora strongly pubescent at base, meso- and metafemora with scattered setigerous punctures; hind tibiae curved, on ventral side with two longitudinal grooves; tarsi short with weak claws. Aedeagus (figs. 49 - 51) 1/4 - 1/5 of body length, tegmen shorter than parameres and slightly enlarged.

Discussion: Near *L. cribratus*, but with less sulcate rows on elytra; aedeagus less swollen at base.

### 5. *Laccobius (Cyclolaccobius) nitidus* GENTILI, 1984 (figs. 52 - 53)

GENTILI 1984: 32 (China, Shaanxi, 32 km S Xian, Nan Wutai, holotype NHML).

Distribution: CHINA, type locality; Hunan: 2 ♂♂ 2 ♀♀ (NMW, MSNV) CWBS loc. 20, 21.

### 6. *Laccobius (Cyclolaccobius) regalis* KNISCH, 1924 (figs. 54 - 55)

KNISCH 1924b: 34-35 (India, Uttar Pradesh, Kumaon, W Almora, lectotype NHML by GENTILI 1979); d'ORCHYMONT 1928: 102; GENTILI 1979b: 46.

Distribution: INDIA, type locality; Uttar Pradesh, Sunderdhunga Valley, 3000 - 4000 m (GENTILI 1979); Gori River Gorge (GENTILI 1979); Chakrata, Khedar Kud., Bangar (d'ORCHYMONT 1928); Himachal Pradesh, Simla Hills, Kotgarh and Gahan (d'ORCHYMONT 1928).

### 7. *Laccobius (Cyclolaccobius) almoranus* sp.n. (figs. 56 - 58)

**Holotype** ♂ (NHML) INDIA, Uttar Pradesh, "Dhabari, C. Almora, H. G. C. [= CHAMPION] X.26".

Description: Length 2.2 mm; width 1.35 mm; maximum breadth at first elytral third. Head black, shagreened or micropunctured, with larger punctures between eyes; eyes large, transverse, reniform, in frontal view each wide, nearly half the interocular space. Pronotum black with narrow lateral yellowish border, slightly wider in centre; shagreened or micropunctured as on head, with larger punctures on the disc. Scutellum nearly equilateral, black. Elytra black with yellowish border, larger near elytral apex; shagreened or micropunctured; elytral punctation comprising about 20 longitudinal rows alternately more and less marked, the majority not complete and consisting of out-of-line punctures. Underside black. Labium straight, without specula. Postlabium wavy, rugose, without conspicuous punctures. Prosternum tectiform with longitudinal keel. Mesosternal keel anteriorly sagittate. Metasternum glabrous only in a narrow central area. Maxillary palpi very short, each shorter than interposed space. Legs short; profemora pubescent at base, meso- and metafemora glabrous; tibiae spinulose, anteriorly with a longitudinal furrow; metatibiae arched; tarsi short, slightly swollen in males; tarsal ratio 4.5.4.3.10; 5.12.5.5.12; 6.18.8.7.15; claws curved only at their tip. Elytral epipleura very oblique, disappearing near metafemora. Aedeagus as in figs. 56 - 58.

Discussion: Near *L. patruelis*, but differs from it in having the whole upper side shagreened, the elytral rows not well defined, the postlabium rugose, and a different aedeagus.

### 8. *Laccobius (Cyclolaccobius) fuscus* sp.n. (figs. 59 - 61)

*patruelis* KNISCH [partim], 1924; GENTILI 1989: 38.

**Holotype** ♂ (NHML), Uttar Pradesh, "Gori R. Gorge, N Kumaon, India, 5-9000 ft. H. G. C. [= CHAMPION]".

Description: Length 2.5 mm; breadth 1.45 mm; body short oval, convex. Head black, hardly paler before the lateral branches of the Y-suture; convex, but anteriorly (labrum and fore part of vertex) nearly vertical; the convex part markedly punctured; eyes reniform, transverse; interocular space, in frontal view, nearly three times the breadth of one eye. Pronotum black, with yellowish borders; the yellow strip widens in centre, not reaching the hind pronotal angles; surface shining and smooth, with punctures as on head. Elytra shining black, with yellowish borders becoming larger in the apical zone; 20 (or nearly 20) longitudinal rows of punctures, alternately more and less conspicuous, the first 10 rows straight and regular, the external rows more confused. Underside dark. Labium without specula; postlabium slightly wavy, smoothly shining, without punctures; gula nearly smooth. Prosternum with a longitudinal keel; mesosternal keel anteriorly sagittate; metasternum pubescent, with a central glabrous area. Legs reddish, short; only the basal part of forefemora pubescent; metatibiae curved; foretarsi of male scarcely swollen. Aedeagus (figs. 59 - 61) nearly 1/4 of body length.

Discussion: Very near *L. patruelis*; differs chiefly in the shape of the aedeagus: more slender, with the median lobe as long and nearly as broad as the parameres; while *L. patruelis* has the median lobe shorter and wider than the parameres. Another difference possibly is the almost vertical outline of the labium and the forehead of *L. fuscus*.

### 9. *Laccobius (Cyclolaccobius) patruelis* KNISCH, 1924 (figs. 62 - 63)

KNISCH 1924b: 36 (India, Uttar Pradesh, Bodiar Haldwani, lectotype NHML by GENTILI 1979); d'ORCHYMONT 1928: 102; GENTILI 1979b: 46; 1989: 38.

Distribution: INDIA, type locality; Uttar Pradesh, Haldwani District (GENTILI 1979); W Almora, Sunderdhunga Valley 2600 - 3600 m (id.); E Almora, Dhakuri (id.); Kumaon, Gori Valley 2300 m (id.); Himachal Pradesh, Simla Hills, Gahan and Kotgarh 2300 m (id.); Simla 2000 - 3000 m (id.); Punjab, Dharamsala (id.); Kulu, Bhabbu Pass 3000 m (id.); Parbatti Valley (id.); PAKISTAN, Hazara, Upper Kagan Valley 2600 m (id.); NEPAL, Karnali, Jumla District, Neurgar 2800 m

(GENTILI 1989); Jumla District, Chautha-Bhulbule 2850 - 3270 m (id.); Jumla District, Rara Lake 3000 m, M. SAKAI 25.IX.1981, 1 ♂ (CMSN); Jumla 2340 m, M. SAKAI 20.IX.1981, 1 ♂ (CMSN); Ghughuti 2660 m, M. SAKAI 21.IX.1981, 1 ♂ (CMSN); Central, Parbat District, Hinku Doban 2400 m (GENTILI 1989); Sagarmatha, Solukhumbu, Thame Og 3800 m (id.); Solukhumbu, Shyangboche 3780 m (id.); Solukhumbu, Monjo 2800 m (id.); Dhaulagiri, Dobang Kharka 2400 m (id.).

#### 10. *Laccobius (Cyclolaccobius) imperialis* KNISCH, 1924 (figs. 64 - 65)

KNISCH 1924b: 35-36 (India, Uttar Pradesh, W Almora, Kumaon, lectotype NHML by GENTILI 1979); d'ORCHYMONT 1928: 101; GENTILI 1979b: 44-45.

Distribution: INDIA, type locality; Gori River Gorge (GENTILI 1979); Central Almora, Dhabari, leg. H.G. Champion, X.1927, 1 ♂ (NHML); Kaligad, Dehra Dun (GENTILI 1979); Ranikhet (d'ORCHYMONT 1928); N Garhwal (d'ORCHYMONT 1928); Haldwani District, leg. H.G. Champion, 17 exs. (NHML); West Bengal, Darjeeling District, Rally Khola 600 m, leg. B. Bhakta, 9.VIII.1981, 1 ♂ 2 ♀♀ (NHMB); Gorubathan 186 m, leg. C.J. Rai, VI.1982, 1 ♀ (NHMB); NEPAL, Bagmati, Kathmandu, leg. M. Satô, 18-27.IX.1979, 1 ♀ (CMSN); Janakpur, Lamosangu, Sindhu 900 m, leg. M. Satô, 18-21.X.1979, 2 ♂♂ 3 ♀♀ (CMSN); Nungarpa, Sindhu 2000 m, leg. M. Satô, 11.IX.1979, 1 ♀ (CMSN); Sagarmatha, Kharikhola, Solukhumbu 2100 m, leg. M. Satô, 7.X.1979, 5 ♂♂ 8 ♀♀ (CMSN); E Nepal, Dolakha District, Kabre 1700 - 1760 m, leg. M. Tomokuni, 17.X.1979, 1 ♂ 1 ♀ (CMSN); Dhaulagiri, Bogara 2200 m, 83°23'E 28°35'N, leg. A. Nakanishi, 21.IX.1971, 1 ♂ 1 ♀ (CMSN); Tini Odhar, Chakkhola, Kabre 730 m, leg. M. Satô, 9.XI.1979, 1 ♀ (CMSN); BHUTAN, Sargham 1000 m, leg. C.J. Rai, VIII.1982, 1 ♀ (NHMB).

#### 11. *Laccobius (Cyclolaccobius) bacchusi* GENTILI, 1979 (figs. 66 - 67)

GENTILI 1979b: 44 (India, Himachal Pradesh, Mandi, Jhatingri 2000 m, holotype NHML).

Distribution: INDIA, type locality; Uttar Pradesh, Landsdowne Div.; NEPAL, Bagmati 2700 m, leg. Löbl & Smetana 19.IV.1981 (MHNG).

#### 12. *Laccobius (Cyclolaccobius) globulus* sp.n. (figs. 68 - 70)

*bacchusi* GENTILI [partim], 1979; GENTILI 1989: 38.

**Holotype** ♂ (NHML), "Haldwani Dist., Kumaon, India, H.G. CHAMPION". One ♀ (MSNV), "Gori R. Gorge, N. Kumaon, India, 5-9000 ft. H.G.C." "*Laccobius imperialis*, KNISCH", possibly belongs to the species.

Description: Length 2.0 mm; breadth 1.3 mm. Externally close to *L. bacchusi*; aedeagus differing by parameres longer than tegmen, median lobe shorter than parameres and not excised at apex (figs. 68 - 70).

#### 13. *Laccobius (Cyclolaccobius) kumaonicus* GENTILI, 1988 (figs. 71 - 73)

GENTILI 1988: 36 (India, Uttar Pradesh, Kumaon, Haldwani District, holotype NHML).

Distribution: INDIA, type locality.

#### 14. *Laccobius (Cyclolaccobius) politus* GENTILI, 1979 (figs. 74 - 75)

GENTILI 1979: 46 (Taiwan, Taipei and vicinity, holotype BMH).

Distribution: CHINA, Taiwan: type locality; Hwalien Hsien, Tienhsang, leg. C.F. Lee 12.VIII.1988, 2 ♂♂ (NTU, NMW, MSNV).

### F. Subgenus *Dimorpholaccobius* ZAITZEV, 1938

ZAITZEV 1938: 120; SHATROVSKIY 1984: 312-313; GENTILI 1988: 40; HANSEN 1991: 290. *Brachypalpus* CASTELNAU, 1840: 56 (synonymy by HANSEN 1991: 290). *Macrolaccobius* GENTILI, 1974: 550 (synonymy by SHATROVSKIY 1984: 312-313).

Type species: *Laccobius sulcatulus* REITTER, 1909, by monotypy.

There are 26 species known, 5 from China and neighbouring countries.

#### Key to the species of the subgenus *Dimorpholaccobius*

- 1 Pronotum shagreened. Male without specula. Mentum shagreened, weakly punctate. Aedeagus as in figs. 78 - 79. 2.8 - 3.6 mm ..... 1. *bipunctatus* (FABRICIUS)
- 1' Pronotum not shagreened. Male with specula ..... 2
- 2 Elytral punctures more or less scattered, only here and there in conspicuous rows. Mentum flat, weakly punctate. Midfemora of male without bristly hairs. Aedeagus as in figs. 76 - 77. 3.0 - 3.4 mm ..... 2. *kashmirensis* d'ORCHYMONT
- 2' Elytral punctures in conspicuous rows, more or less regular ..... 3
- 3 Mentum coarsely rugose-punctate; surface appearing granulate because of close punctation. Midfemora of male with well-developed bristly hair (fig. 90). Elytral punctate rows rather irregular, punctures of 5th row not in straight line (fig. 92). Aedeagus as in figs. 80 - 81. 3.1 - 4.6 mm ..... 3. *striatulus* (FABRICIUS)
- 3' Mentum moderately or weakly punctate; surface never appearing granulate because punctures separated or, if approximate, as in some individuals of *hindukuschi*, with surface strongly shagreened ..... 4
- 4 Punctures of 5th elytral row not in straight line (fig. 161). Fore margin of male head sinuate because of large specula. Mentum flat, not or weakly shagreened. Aedeagus as in figs. 82 - 83. 3.2 - 4.2 mm ..... 4. *simulans* d'ORCHYMONT
- 4' Punctures of 5th elytral row in straight line (fig. 162). Fore margin of male head nearly evenly curved. Mentum granulated and shagreened. Aedeagus as in figs. 84 - 85. 2.7 - 3.8 mm ..... 5. *hindukuschi* CHIESA

#### 1. *Laccobius (Dimorpholaccobius) bipunctatus* (FABRICIUS, 1775) (figs. 78 - 79)

FABRICIUS 1775: 229 (*Hydrophilus*, Sweden, Uppsala, lectotype MZUC by GENTILI & CHIESA 1975); d'ORCHYMONT 1930: 33-39; 1936: 437-438; GENTILI & CHIESA 1975: 120-126; VAN BERGE HENEGOUWEN 1982: 74-76; 1989: 13; SHATROVSKIY 1984: 322-323. *alutaceus* THOMSON, 1868: 311-313 (Lapponia, lectotype IZUL by GENTILI & CHIESA 1975; synon. by d'ORCHYMONT 1930). *emeryanus* ROTTENBERG, 1874: 318 (Italy, Palermo, lectotype IPEF by GENTILI & CHIESA 1975; synonymy by d'ORCHYMONT 1936). *graecus* ROTTENBERG, 1874: 317-318 (*alutaceus* var., Greece, Nauplia, lectotype IPEF and synonymy by GENTILI & CHIESA 1975). *biguttatus* (non GERHARDT, 1877); KUWERT 1890 et al., cfr. GENTILI & CHIESA 1975: 120.

Distribution: KAZAKHSTAN, Alma Ata, Djarkent (= Panfilov), Semirjetchensk, ex coll. Winkler, 1 ♂ (NMW); EUROPE, N AFRICA, TURKEY.

#### 2. *Laccobius (Dimorpholaccobius) kashmirensis* d'ORCHYMONT, 1943 (figs. 76 - 77)

d'ORCHYMONT 1943b: 1-3 (India, Kashmir Valley 1500 - 2000 m, holotype IMC); GENTILI & CHIESA 1975: 130-131; GENTILI 1979b: 36; 1982: 36.

Distribution: INDIA, type locality; Kashmir, Gangribal (d'ORCHYMONT 1943); Kiuhnus, L. Wuhlar (id.); "Bengal Inf." (GENTILI & CHIESA 1975); PAKISTAN, Azad Kashmir, Dras, M. Sooroo 3100 m (GENTILI 1982); Parkutta, Indus River Valley 2350 m (id.).

### 3. *Laccobius (Dimorpholaccobius) striatulus* (FABRICIUS, 1801) (figs. 80 - 81; 90)

FABRICIUS 1801: 254 (*Hydrophilus*, Germany, holotype MZUC); GANGLBAUER 1904: 253 (*nigriceps*); d'ORCHYMONT 1930: 264-265; BALFOUR-BROWNE 1958: 56-59; GENTILI & CHIESA 1975: 107-116; GENTILI 1979a: 48; 1980a: 32; VAN BERGE HENEGOUWEN 1982: 81; SHATROVSKIY 1984: 319-320. *nigriceps* THOMSON, 1853: 50 (Sweden, Öland, lectotype IZUL by GENTILI & CHIESA 1975; synonymy by d'ORCHYMONT 1930). *maculiceps* ROTTENBERG, 1874: 308-310 (*nigriceps* var., Germany, Eppelsheim, lectotype IPEF by GENTILI & CHIESA 1975; synonymy by GANGLBAUER 1904). *purpurascens* NEWBERY, 1908: 30 (Great Britain, Shaldon, Devon, present vic. Exeter, lectotype ZMUC by GENTILI & CHIESA 1975; synonymy by BALFOUR-BROWNE 1958). *bucciarellii* GENTILI, 1974: 550 (Caucasus, Beiseho, holotype MSNM; synonymy by SHATROVSKIY 1984).

Distribution: KIRGIZSTAN, Say-Chelek, Chaktal' Range (SHATROVSKIY 1984); KAZAKHSTAN, Dzhambul [= Aulie Ata] (GENTILI 1979a); Semirech'je, Kurday Pass (SHATROVSKIY 1984). EUROPE, TURKEY, CAUCASUS, UZBEKISTAN.

### 4. *Laccobius (Dimorpholaccobius) simulans* d'ORCHYMONT, 1923 (figs. 82 - 83)

d'ORCHYMONT 1923: 7-8 (China, Yünnan, holotype ISNB); 1928: 102; 1932: 401; 1935b: 209; 1937: 37; GENTILI & CHIESA 1975: 137-138; GENTILI 1979b: 35-36; 1988: 41. *knischi* BALFOUR-BROWNE, 1938: 30-31 (India N, Uttar Pradesh, Almora, Khaula 1500 m, holotype BMNH; synonymy by GENTILI & CHIESA 1975).

Distribution: CHINA, Yünnan: type locality; 2 ♀♀ (NMW) CWBS loc. 14 or 15; Diaolin Nat. Res., 100 km W Kunming, leg. E. Jendek & O. Sausa, 22.V.-2.VI.1993, 5 ♂♂ 8 ♀♀ (NMW, MSNV); W Yünnan, nr. Baoshan, leg. E. Jendek & O. Sausa, 5.-8.VI.1993, 1 ♂ 1 ♀ (NMW); INDIA, Himachal Pradesh, Kangra District, Bajaura (GENTILI 1979b); Simla District, Simla Hills (d'ORCHYMONT 1932); Uttar Pradesh, Kumaon Lakes (GENTILI 1979b); Kumaon, Ranikhet (BALFOUR-BROWNE 1939); Almora, Khaula 1400 m (id.); Hardwar, River Ganga (id.); Naini Tal 2000 m (d'ORCHYMONT 1923); Punjab, Salt Range, Khewra Gorge (d'ORCHYMONT 1937); Bihar, Pusa (d'ORCHYMONT 1923); Senchal nr. Ghooms 2100 m (id.); West Bengal, Kurseong 1800 m (id.); Darjeeling (d'ORCHYMONT 1932); Darjeeling District, Sitong, Jor Pokri 1600 m (GENTILI 1979b); NEPAL, Gandaki, Pokhara Valley, Lumle 1600 m (GENTILI 1988); Pokhara Valley, Landrung 1500 - 2000 m (id.); Bagmati, Kathmandu Valley, Godawari 1500 m (id.); Bagmati River at Bagmati (id.); E Nepal, Thamur Valley, Dhankuta-Hile 1200 m (id.); E Nepal, Arun Valley, Mure-Num 2000 m (id.).

### 5. *Laccobius (Dimorpholaccobius) hindukuschi* CHIESA, 1966 (figs. 84 - 85)

CHIESA 1966: 302 (Afghanistan, Ejan, Salangtal, Hindukusch, holotype HMNH); GENTILI & CHIESA 1975: 97-98; GENTILI 1979a: 48; 1980a: 33; 1982: 35; 1988: 42; 1991: 388; SHATROVSKIY 1984: 316-319. *farsicus* GENTILI, 1975: 128 (Iran, Farsistan, Shiraz, holotype NMP; synonymy by SHATROVSKIY 1984).

Distribution: AFGHANISTAN, type locality; Badakhshan, Faizabad, Kokshatal 1450 m (GENTILI & CHIESA 1975); Baghlan; Kabul; Nurestan; PAKISTAN, Azad Kashmir, Baltistan, Skardu 2200 m (GENTILI 1979a); North West Frontier, Hazara, Lower Kagan Valley 1100 m (NHML); INDIA, Uttar Pradesh, W Almora, Kumaon (GENTILI 1988); NEPAL, Karnali, Jarkot 4000 m (id.); Ghora Pani Pass (id.); IRAN; IRAK; TURKEY; RUSSIA; GEORGIA; ARMENIA; UZBEKISTAN; TURKMENISTAN; TADZHIKISTAN.

### G. Subgenus *CompsoLaccobius* GANGLBAUER, 1904

GANGLBAUER 1904: 251; GENTILI 1974: 549; SHATROVSKIY 1984: 302-303; HANSEN 1991: 290.

Type species: *Hydrophilus decorus* GYLLENHAL, 1827, by monotypy.

Of the 2 species belonging to this subgenus 1 may occur in China.

### 1. *Laccobius (Compsolaccobius) decorus* (GYLLENHAL, 1827) (figs. 14 - 15, 18, 163 - 164)

GYLLENHAL 1827: 275 (*Hydrophilus*, Sweden, lectotype NHRS by GENTILI & CHIESA 1975); GENTILI 1973: 57; GENTILI & CHIESA 1975: 30-32; SHATROVSKIY 1984: 122-124. *pallidissimus* (non REITTER, 1899); ZAITZEV 1938: 114 (partim); 1953: 107.

Distribution: MONGOLIA, Bajanchongor Ajmak, SE Orog Nur 1200 m (GENTILI 1973); Tujn Gol nr. Bogd 1250 m (id.); Tujn Gol, 4 km S Zinst 1480 m (id.); AFGHANISTAN, Badghis nr. Kushka (GENTILI & CHIESA 1975); Baltic littoral: SWEDEN, FINLAND, ESTONIA, LATVIJA; UKRAINA, Crimea; GEORGIA; KAZAKHSTAN; TURKMENISTAN; UZBEKISTAN; TADZHIKISTAN; RUSSIA, Krasnodar Territory, Kalmyk Republic, Novosibirsk Province.

### H. Subgenus *Laccobius* s. str. ERICHSON, 1837

ERICHSON 1837: 202; GENTILI 1974: 549; GENTILI & CHIESA 1975: 21; SHATROVSKIY 1984: 304; HANSEN 1991: 290.

Type species: *Chrysomela minuta* LINNAEUS, 1758, by monotypy.

Ten species are known in the Old World; 9 were recorded from China and neighbouring areas.

#### Key to the species of the subgenus *Laccobius*

- 1 Claws not evenly curved, upper edge straight for a considerable distance, convex below (fig. 19). Midfemur of male with bristly hair (fig. 91). Pronotum smooth, not shagreened. Elytra with small confused rows of punctures. Aedeagus as in figs. 88 - 89. 2.5 - 3.3 mm ..... 1. *binotatus* d'ORCHYMONT
- 1' Claws evenly curved (figs. 21 - 22) ..... 2
- 2 Hind tarsal segment 3 approximately half as long as 2 (fig. 96). Pronotum not shagreened. Specula present in male ..... 3
- 2' Hind tarsal segment 3 approximately 3/4 as long as 2 (fig. 97). Specula absent in male ..... 6
- 3 Punctures around scutellum somewhat confused, not regularly set. Male without specula. Aedeagus as in figs. 100 - 101. 2.6 - 3.1 mm ..... 2. *nobilis* GENTILI
- 3' Punctures around scutellum more regularly set in longitudinal rows ..... 4
- 4 Aedeagus as in figs. 98 - 99; penis sharply broadened in apical third: parameres without apical spines. 2.8 - 3.3 mm ..... 3. *bedeli* SHARP
- 4' Aedeagus different; penis evenly broadened in apical half; parameres with small spines directed outwardly. 2.6 - 3.1 mm ..... 5
- 5 Aedeagus as in figs. 92 - 93. Penis without preapical straightening ..... 4. *inopinus* GENTILI
- 5' Aedeagus as in figs. 86 - 87. Penis with a preapical straightening ..... 5. *kmashiricus* SHATROVSKIY
- 6 Elytra with pale area around scutellum and with similar preapical spots; pale spots around punctures reduced. Pronotum normally not shagreened. Aedeagus as in figs. 104 - 105. 2.5 - 3.1 mm ..... 6. *biguttatus* GERHARDT
- 6' Elytra without pale area around scutellum and sometimes without preapical spots. Pronotum always shagreened ..... 7
- 7 Pronotum and basal part of elytra strongly shagreened, narrower and parallel-sided; elytra pointed at tips (fig. 94). Aedeagus as in figs. 106 - 107. 2.2 - 2.9 mm ..... 7. *cinereus* MOTSCHULSKY
- 7' Pronotum more weakly shagreened, elytra not shagreened; broadened, oval; elytra usually rounded apically (fig. 95) ..... 8
- 8 Midfemur of male with bristly hair (fig. 90). Elytral rows of punctures somewhat irregular or less straight, chiefly around scutellum. Aedeagus as in figs. 108 - 109. 2.4 - 3.0 mm ..... 8. *expectans* GENTILI



- 7' Midfemur of male without bristly hair. Elytral rows more regular and straight. Aedeagus as in figs. 102 - 103. 2.5 - 3.3 mm ..... 9. *minutus* (LINNAEUS)

### 1. *Laccobius (Laccobius) binotatus* d'ORCHYMONT, 1935 (figs. 19, 88 - 89, 91)

D'ORCHYMONT 1935a: 109-110 (China, Beijing, holotype ISNB); 1935b: 208; GENTILI & CHIESA 1975: 51-52; GENTILI 1979b: 34; 1982: 32; 1984: 31; 1988: 40; 1991: 387; SHATROVSKIY 1984: 308-309; 1989: 291. *czerskii* ZAITZEV, 1938: 116 (Russia, Primorye, Spass District, Novovladimirovka, lectotype ZIL and synonymy by SHATROVSKIY 1984).

Distribution: CHINA, Jilin: 67 ♂♂ 82 ♀♀ (NMW, MSNV) CWBS loc. 67, 77, 79, 81, 88 - 90, 93 - 95; Liaoning: 3 ♂♂ 17 ♀♀ (NMW, MSNV) CWBS loc. 69, 98 - 100; Beijing: type locality; Badaling (GENTILI 1988); CWBS loc. 9, 10; Shaanxi, Xian 20 km S, Nan Wutai (GENTILI 1988); Heilongjiang, Erlungshan (GENTILI & CHIESA 1975); Heilongjiang, Harbin (id.); Anhui, Jiuhua Shan (GENTILI 1979b); Shandong, Qingdao (GENTILI & CHIESA 1975); Shandong, Jinan Shi (GENTILI 1982); Fujian, Fuzhou Shi (GENTILI 1979b); Guangdong, Lungmen nr. Honanfu (GENTILI 1988); Henan, Luoyang Shi (GENTILI & CHIESA 1975); Henan, "Lin Hsien" [= Lin Xian, Anyang Prefecture, ca. 40 km NW Hebi City] (id.); Hubei, Hankou (d'ORCHYMONT 1935); Sichuan, "Tatsienlu" [= Kangding Xian, W Chengdu] (GENTILI & CHIESA 1975); Sichuan, Wa Shan 2000 m (GENTILI 1979b); Tibet, Yalong Jiang basin 2000 m (id.); Yunnan (GENTILI & CHIESA 1975); RUSSIA, Khabarovsk Territory, Teploye Lake on Bira River (SHATROVSKIY 1984); Khekhtsir Range (id.); Primorye, Bak River (id.); Kuleshkova River at Krasny kut Village (id.); Khanka District, Novoselishkhe (id.); Mountain Taiga Station (id.); Artem (id.); Tigrovoy (id.); Lazovskiy Residence (id.); Vladivostok (GENTILI & CHIESA 1975); Vladivostok, Nakhodka (SHATROVSKIY 1984); Vladivostok, Popova (id.); Sakhalin Island, Smirnye, old course of Orlovka River (id.); Primorye, nr. Arsenev, leg. M. Strba, VI.1991, 1 ♀ (NMW); NORTH KOREA, Cheongjin (GENTILI & CHIESA 1975); SOUTH KOREA, Busan (GENTILI 1991); 13 km E Seoul, River Han 100 m (GENTILI 1982).

### 2. *Laccobius (Laccobius) nobilis* GENTILI, 1979 (figs. 96, 100 - 101)

GENTILI 1979b: 34-35 (China, Yunnan, holotype MHNP).

Distribution: CHINA, type locality; Yunnan, 100 km W Kunming, Diaolin Nat. Reserve, leg. E. Jendek & O. Sausa, 22.V.-2.VI.1993 (NMW); Fujian, "Sung Chi" (GENTILI 1979b).

### 3. *Laccobius (Laccobius) bedeli* SHARP, 1884 (figs. 98 - 99)

SHARP 1884: 455 (Japan, Hokkaido, Hakodate, lectotype NHML by GENTILI & CHIESA 1975); ZAITZEV 1908b: 392; JACOBSON 1911: 856; KAMIYA 1935: 4; BALFOUR-BROWNE 1946: 458; GENTILI & CHIESA 1975: 46-47; SHATROVSKIY 1984: 308; 1989: 291; LEE, CHO & LEE 1988: 72.

Distribution: CHINA, Heilongjiang, "Cheng-Chin", Hingan Ling, "Hsiao King an ling Shan mo" (BALFOUR-BROWNE 1946, determination not sure); Liaoning, "Jehol, Ai-tao-tzu-lian" (KAMIYA 1935); Liaoning, "Kelan Point" (BALFOUR-BROWNE 1946); RUSSIA, Primorye, Khasan, Mongugai (GENTILI & CHIESA 1975); Spassk District, Khasan Lake, Novovladimirovka (SHATROVSKIY 1984); mouth of Radzol'nyy River (id.); SOUTH KOREA (LEE, CHO & LEE 1988); JAPAN, Hokkaido, Honshu, Shikoku, Kyushu, Tsushima.

### 4. *Laccobius (Laccobius) inopinus* GENTILI, 1980 (figs. 92 - 93)

GENTILI 1980: 30 (Japan, Honshu, Tokyo, Sikuwana, holotype USNM); 1984: 31; 1988: 40; 1991: 387. *miyuki* MATSUI, 1986: MATSUI 1986, 86-87 (Japan, Kyushu, Kagoshima Pref., Sata, holotype CTN; synonymy by GENTILI 1988). *nobilis* GENTILI, 1979: SHATROVSKIY 1984: 308; 1989: 291.

Distribution: CHINA, Jilin: 31 ♂♂ 23 ♀♀ (NMW, MSNV) CWBS loc. 67, 77, 79, 83, 88, 89; RUSSIA, Khabarovsk Territory, Khekhstir Range (SHATROVSKIY 1984); Primorye, Bak River at confluence of Ussuri River (id.); Kirovskiy District, Krylovka (id.); Blagodatnoye (id.); Spassk District, Novovladimirovka in Imanskogo Uyesda (id.); Artemovka River (id.); Puyatina Island, Gulf of Peter the Great (id.); Primorye, Ussurijsk, Kaimanovka, leg. D. Boukal, 2.-9.8.1992, 1 ♂ (NMW); Primorye, Tigrovoy, leg. D. Boukal, 19.-21.8.1992, 7 ♀♀ (NMW, MSNV); JAPAN, Honshu, Kyushu, Yakushima.

Discussion: SHATROVSKIY (1984) wrote: "The name *L. nobilis* is here accepted provisionally, inasmuch as the figures of the genitalia in the description are rather schematic and the type will have to be studied". *L. inopinus* differs from *L. nobilis* in possessing specula, more regular rows of punctures on the elytral disc near the scutellum, a less slender aedeagus, and an even broadened penis in the apical half (the broadening of *L. nobilis* is near the apex).

### 5. *Laccobius (Laccobius) kunashiricus* SHATROVSKIY, 1984 (figs. 86 - 87)

SHATROVSKIY 1984: 308 (Russia, Kuril Islands, Kunashir Island, Golovnin volcano, holotype ZIL); 1989: 291; GENTILI 1989: 37; 1991: 387.

Distribution: RUSSIA, type locality; JAPAN (GENTILI 1989), Hokkaido, Honshu.

### 6. *Laccobius (Laccobius) biguttatus* GERHARDT, 1877 (figs. 104 - 105)

GERHARDT 1877: 23 (Poland, Legnica) GANGLBAUER 1904: 252; d'ORCHYMONT 1930: 33-39; GENTILI & CHIESA 1975: 42-46; SHATROVSKIY 1984: 307; GENTILI 1988: 40; SHATROVSKIY 1989: 291. *colon* STEPHENS, 1829: 133 (*Hydrobius*; lectotype NHML by GENTILI & CHIESA 1975; *nomen oblitum*). *nanulus* ROTTENBERG, 1874: 316-317 (*minutus* var.; Hannover, types not seen; syn.n.). *mongolicus* GENTILI, 1973: 62-65 (Mongolia, Bajanchongor Ajmak, 4 km S Zinst, Tujn Gol 1480 m, holotype HMNH; synonymy by GENTILI 1988); GENTILI & CHIESA 1975: 131-133.

A neotype (MSNV) was designated by GENTILI & CHIESA (1975). However, two syntypes, one male and one female, mounted on one pin (NMW) were recently retrieved: "♀", "*biguttatus* Gerh. type Liegnitz", "*biguttatus*". The male is herewith designated as lectotype. The neotype designation is thus invalid.

Distribution: CHINA, Heilongjiang, Harbin (GENTILI & CHIESA 1975); MONGOLIA, Bajanchongor Ajmak, 4 km S Zinst, Tujn Gol 1480 m (GENTILI 1973, as *L. mongolicus*); mouth of River Khankhin Gol (SHATROVSKIY 1984); W KAZAKHSTAN; UZBEKISTAN; RUSSIA: Central Siberia, European part; EUROPE except W and S.

### 7. *Laccobius (Laccobius) cinereus* MOTSCHULSKY, 1860 (figs. 94, 106 - 107)

MOTSCHULSKY 1860: 103 (Russia, Sibiria Orientalis, Station Turuntaewsk, lectotype ZMUM by GENTILI & CHIESA 1975); ZAITZEV 1908b: 392 (partim); 1938: 111-113 (partim); JACOBSON 1911: 856 (partim); GENTILI 1973: 59-60; GENTILI & CHIESA 1975: 40-42; BERLOV 1978: 70; SHATROVSKIY 1984: 305-307; 1989: 291. *littoralis* J. SAHLBERG, 1900: 189 (E Kirgizstan, Lake Issyk-Kul, lectotype ZMH and synonymy by GENTILI & CHIESA 1975).

Distribution: RUSSIA, type locality; Amur, Zeya (SHATROVSKIY 1984); Republic Jakutija: Olenek, Jakutsk, Verkhojansk (id.), Olekminsk, Ytik-haya (GENTILI & CHIESA 1975); Irkutsk Prov. (BERLOV 1978); Rep. Buriatija: Tibelti, Ulan Ude (GENTILI & CHIESA 1975); MONGOLIA, Uvs Ajmak, Baruunturuun 1280 m (GENTILI 1973); Bajanchongor Ajmak, Bogd, river Tujn 1250 m (id.); Uburchangaj Ajmak, Arbajcher, river Ongijn 1800 m (id.); Archangaj Ajmak, lake Ogij Nur 1350 m (id.); Central Ajmak, Bajandelger, river Kerulen 1340 m (id.); Choibalsan Ajmak, 32 km SE Bajan Uul 750 m (id.); Chentej Ajmak, Norovlin 900 m (id.); KIRGIZSTAN, Lake Issyk-Kul (SAHLBERG 1900); UZBEKISTAN, Tashkent; E EUROPE (*nanulus*).

**8. *Laccobius (Laccobius) expectans* GENTILI, 1980 (figs. 108 - 109)**

GENTILI 1980a: 30 (China, Shandong, Jinan, holotype USNM).

Distribution: CHINA, type locality; Beijing (GENTILI 1980a).

**9. *Laccobius (Laccobius) minutus* (LINNAEUS, 1758) (figs. 11, 21, 95, 102 - 103)**LINNAEUS 1758: 372 (*Chrysomela*; "habitat in Europae aquis", neotype MSNV by GENTILI 1979); GENTILI 1973: 58-59; 1979a: 43; GENTILI & CHIESA 1975: 34-40; SHATROVSKIY 1984: 307; 1989: 291.

Distribution: RUSSIA, Chita (SHATROVSKIY 1984); KIRGIZSTAN, Frunze (id.); MONGOLIA, Uvs Ajmak (GENTILI 1973); Chovsgol Ajmak (id.); Gobi Altai Ajmak (id.); Chovd Ajmak (id.); Bajanchongor Ajmak (id.); Uburchangaj Ajmak (id.); Archangaj Ajmak (id.); Central Ajmak (id.); Choibalsan Ajmak (id.); EUROPE; SIBERIA; TURKEY.

**I. Subgenus *Microlaccobius* GENTILI, 1974**

GENTILI 1974: 550; GENTILI &amp; CHIESA 1975: 22; SHATROVSKIY 1984: 302-303; HANSEN 1991: 290-291.

Type species: *Laccobius gracilis* MOTSCHULSKY, 1855, by original designation.

Fifty-two species belong to this subgenus; 22 are known from China and neighbouring countries.

**Key to the species of the subgenus *Microlaccobius***

- |    |   |                                |
|----|---|--------------------------------|
| 1  | Eyes larger: frons between eyes twice (or less) width of one eye (fig. 3). Pale preocular spots large and confluent. Dark pronotal spot small .....   | 2                              |
| 1' | Eyes of normal size: frons between eyes 2.5 - 3 times width of one eye (fig. 4). Head and pronotum usually darker .....   | 5                              |
| 2  | Pronotum slightly shagreened; pronotal dark spot often subdivided into a number of dots. Aedeagus as in figs. 110 - 111. 1.8 - 2.5 mm .....   | 1. <i>laotianus</i> GENTILI    |
| 2' | Pronotum smooth, at most with sparse traces of shagreen; pronotal dark spot entire or divided into 2 paired spots .....   | 3                              |
| 3  | Mesosternal keel forming a simple tubercle. Anterior third of lateral margins of the pronotum nearly straight; pronotal dark spot divided into 2 paired spots. Aedeagus as in figs. 112 - 113. 2.0 - 2.8 mm ..... | 2. <i>gangeticus</i> GENTILI   |
| 3' | Mesosternal keel as a lamina with a tubercle. Lateral margins of the pronotum anteriorly clearly curved .....   | 4                              |
| 4  | Pronotal dark spot divided into 2 paired spots. Mesosternal keel with a tooth anteriorly. Aedeagus as in figs. 114 - 117. 2.0 - 2.4 mm .....  | 3. <i>argillaceus</i> SAHLBERG |
| 4' | Pronotal dark spot normally entire, with 4 protruding corners. Mesosternal keel with a tooth in centre. Aedeagus as in figs. 118 - 120. 2.1 - 2.9 mm .....  | 4. <i>himalayanus</i> GENTILI  |
| 5  | Pronotum shagreened, at least on anterior half; the shagreen is sometimes conspicuous only at high magnification (100 x) .....  | 6                              |
| 5' | Pronotum without shagreen, smooth and shining .....   | 11                             |
| 6  | Body more slender and smaller. Dark pronotal spot reduced, normally not reaching anterior margin. Tegmen nearly as long as parameres .....  | 7                              |
| 6' | Body broader and larger. Dark pronotal spot larger, normally reaching the anterior margin. Foretarsi of males as broad as apices of foretibiae. Tegmen short .....  | 9                              |
| 7  | Postlabium shagreened. Pale preocular spots normally larger, reaching the eyes. Foretarsi of males clearly narrower than apices of foretibiae. Length 1.7 - 2.5 mm. Aedeagus as in figs. 126 - 127 .....          | 5. <i>roseiceps</i> RÉGIMBART  |

- 7' Postlabium smooth. Pale preocular spots only before the lateral branches of the Y-suture ..... 8
- 8 Foretarsi of males narrower than apices of foretibiae. Shagreen of pronotum and head conspicuous at 60 x. Length 1.5 - 2.1 mm. Aedeagus as in figs. 121, 125 ..... 6. *indonesiae* GENTILI
- 8' Foretarsi of males as broad as apices of foretibiae. Shagreen of pronotum and head conspicuous at 100 x. Length 1.7 - 2.0 mm. Aedeagus as in figs. 128 - 129 ..... 7. *nepalensis* GENTILI
- 9 Interocular space broader, nearly 3 times the breadth of one eye..... 10
- 9' Interocular space narrower, nearly 2.5 times the breadth of one eye ..... 11
- 10 Sides of pronotum broadly pale yellow; elytra also pale yellow. Base of longitudinal rows of punctures I - V less regular. Length 2.2 - 2.9 mm. Aedeagus as in figs. 159 - 160..... 8. *fragilis* NAKANE
- 10' Sides of pronotum and elytra darker. Elytral rows of punctures more regular, primary and secondary rows markedly differing from each other. Length 2.2 - 3.5 mm. Aedeagus as in figs. 132 - 133 ..... 9. *oscillans* SHARP
- 11 Head and pronotum entirely shagreened. Aedeagus with median lobe much shorter than parameres (figs. 130 - 131). Length 1.9 - 2.4 mm ..... 10. *formosus* GENTILI
- 11' Head shagreened; pronotum shagreened only on anterior part. Median lobe as long as parameres (figs. 134 - 135). Length 2.5 mm ..... 11. *florens* GENTILI
- 12 Eyes larger: interocular space about 2.5 times the breadth of one eye ..... 13
- 12' Interocular space about 3 times the breadth of one eye ..... 14
- 13 Basal part of elytral rows I - V somewhat confused near scutellum. Aedeagus as in figs. 136 - 137. Length 2.2 - 2.6 mm ..... 12. *elegans* GENTILI
- 13' Elytral rows straight and regularly incised from the base. Colour of pronotum and elytra darker. Aedeagus as in figs. 142 - 143. Length 2.1 - 2.5 mm ..... 13. *hammondi* GENTILI
- 14 Punctures of fifth elytral row more out-of-line, not forming straight line (fig. 161) ..... 15
- 14' Punctures of fifth elytral row more uniform, in straight line (fig. 162) ..... 20
- 15 Only the basal part of fifth elytral row is out-of-line. Aedeagus as in figs. 146 - 147. Length 2.2 - 2.6 mm ..... 14. *tonkinensis* GENTILI
- 15' The entire fifth elytral row is out-of-line ..... 16
- 16 Punctures of third elytral row more out-of-line ..... 17
- 16' Punctures of third row more uniform, in straight line ..... 19
- 17 Punctures of head, pronotum and elytra abundant and conspicuous. Apices of parameres spoon-shaped in frontal view, median lobe straight in lateral view (figs. 140 - 141). Length 2.7 - 3.2 mm ..... 15. *kaszabi* CHIESA
- 17' Punctures of head, pronotum and elytra sparse and faint. Apices of parameres spatulate, median lobe curved in lateral view ..... 18
- 18 Median lobe of the aedeagus narrower; parameres with a basal indentation (figs. 144 - 145). Length 2.8 - 3.0 mm ..... 16. *sinicus* GENTILI
- 18' Median lobe of aedeagus broader; parameres without basal indentation (figs. 148 - 149). Length 2.8 - 3.2 mm ..... 17. *sublaevis* SAHLBERG
- 19 Median lobe of the aedeagus broad at base (figs. 150 - 152). Length 2.4 - 3.0 mm ..... 18. *problematicus* GENTILI
- 19' Median lobe of the aedeagus narrow at base, then broadened (figs. 153 - 155). Length 2.4 - 2.9 mm ..... 19. *mistus* GENTILI
- 20 Punctures of fifth elytral row dense and close; fifth row straight but some punctures slightly out-of-line. Dark spot of pronotum with a clear pale dot in lateral projection. Aedeagus as in figs. 123 - 125. Length 2.4 - 2.9 mm ..... 20. *orientalis* KNISCH

- 20' Punctures of fifth elytral row more scarce and not out-of-line. Spot of pronotum entirely dark ..... 21
- 21 Dark spot of pronotum often smaller; elytral punctures often fainter. Median lobe of aedeagus uniformly broad (figs. 156 - 158). Length 1.9 - 2.9 mm ..... 21. *quaesitus* GENTILI
- 21' Dark spot of pronotum reaching anterior and posterior margins, laterally reaching the external level of eyes. Median lobe narrower in apical half (figs. 138 - 139). Length 2.2 - 2.7 mm ..... 22. *exilis* GENTILI

### 1. *Laccobius (Microlaccobius) laotianus* GENTILI, 1979 (figs. 110 - 111)

GENTILI 1979b: 40-41 (Laos, Vientiane, Gi Sion Village, de Tha Ngone, holotype BMH).

Distribution: NEPAL, Mid West, Dang, Amiliya, Rapati Nadi, leg. S. Sharma, 22.12.1993, 1 ♂ (NMW); LAOS, type locality; Vientiane (GENTILI 1979); Vientiane, Ban Van Euc (id.).

### 2. *Laccobius (Microlaccobius) gangeticus* GENTILI, 1979 (figs. 112 - 113)

GENTILI 1979b: 37-38 (India, Uttar Pradesh, Hardwar, River Ganges 650 m, holotype NHML); 1988: 44.

Distribution: INDIA, type locality; West Bengal, Malda 110 m (GENTILI 1979); Sukna, 55 km S of Darjeeling (id.).

### 3. *Laccobius (Microlaccobius) argillaceus* SAHLBERG, 1900 (figs. 114 - 117)

SAHLBERG 1900: 188 (Kirgizstan, Tokmak, river Tschu, lectotype ZMUB by GENTILI & CHIESA 1975); ZAITZEV 1908b: 392; 1938: 114; JACOBSON 1911: 856; KNISCH 1924a: 184; d'ORCHYMONT 1928: 101; 1935b: 208; 1936: 433-435; GENTILI & CHIESA 1975: 62-64; GENTILI 1979b: 42; 1982: 32; 1988: 43; 1991: 388; SHATROVSKIY 1984: 311; HEBAUER 1991: 176.

Distribution: KIRGIZSTAN, type locality; TADZHIKISTAN, Scravshan, Ura-Tjube (HEBAUER 1991); NEPAL, Bagmati, Kathmandu (GENTILI 1988); Bagmati, Gokarna 1500 m, mixed primary forest, leg. M.G. Allen, 1.VIII.1983 (NHML); Dahran (GENTILI 1988); Koshi, Dhankuta, Leoti Khola 370 m, leg. M. Satô, 3.XI.1979, 1 ♂ 1 ♀ (CMSN); Central Nepal, Gorkha, , leg. I. Jenis 26-31.V.1992, 1 ♂ (NMW); INDIA, Uttar Pradesh, River Ganges (GENTILI & CHIESA 1975); West Bengal, Darjeeling district, Renok (GENTILI 1991); BURMA, Sagaing, Katha (GENTILI 1982).

### 4. *Laccobius (Microlaccobius) himalayanus* GENTILI, 1988 (figs. 118 - 120)

GENTILI 1988: 34 (Nepal, Bagmati, Kathmandu Distr., Gokarna 1400 m, holotype NHML).

Distribution: NEPAL, West, Syanga Galyang 650 m, Andhi Khola, leg. Moog & al., 7.11.1993, 1 ♂ 1 ♀ (NMW); West, Kaski Pokhara, Seti Nadi, leg. Moog et al., 11.11.1993, 2 ♂ ♂ 7 ♀ ♀ (NMW); type locality; Bagmati, Kathmandu District, Kathmandu (GENTILI 1988); Bagmati, Godavari 1600 - 2200 m, leg. H. Makihara, 18.VIII.1972 (CMSN); Gokarna Ban 1370 m, leg. M. Satô, 17.X.1979 (CMSN); Gandaki, Pokhara Valley (GENTILI 1988); Gandaki, Phewa Tal (id.); Koshi, Dhankuta, Leoti Khola 370 m, leg. M. Satô, 3.XI.1979 (CMSN); Thamur Khola, M. Satô 3.XI.1979 (CMSN); near Birganj, Lothar 150 m (GENTILI 1988); Central, Kabrepalanchowk Distr., Dolalgat, Cha Khola, leg. Moog et al., 7.11.1993, 1 ♂ 1 ♀ (NMW); INDIA, West Bengal, Darjeeling District, Ralle, leg. B. Bhakhta, 2.V.1987, 1 ♀ (NHMB); Darjeeling District, Sindepung 23.IV.1987, leg. B. Bhakhta, 1 ♀ (NHMB).

### 5. *Laccobius (Microlaccobius) roseiceps* RÉGIMBART, 1903 (figs. 126 - 127)

RÉGIMBART 1903b: 59 (Vietnam, "Annam", Thuan an, lectotype MHNP by GENTILI 1979); GENTILI 1979b: 46-47; 1980b: 398-400; 1981: 274; 1988: 43; 1989: 38; 1991: 338.

Distribution: CHINA, Hong Kong: Tai Po Kau, leg. D. Dudgeon, 14.VII.1983, 1 ♂ (NMW); New Territories, leg. D. Dudgeon, 20.IV.1981, 1 ♀ (MSNV); INDIA, Uttar Pradesh, Hardwar, River Ganges 700 m (GENTILI 1979b); Bihar; Maharashtra; Tamil Nadu (id.); VIETNAM, type locality; "Annam", Nha Trang, Nhuoi Nhi (GENTILI 1979b); "Cochinchina" (id.); Quang Tri Province, Quang Tri 1.5 km N (GENTILI 1988); Quang Tri Province, Cam Lo 11 km N (id.); PHILIPPINES, Is. Mindanao; Is. Leyte; INDONESIA, Sulawesi; Borneo; Ambon; NEW GUINEA, Papua New Guinea; Irian Jaya; AUSTRALIA, Northern Territory.

#### 6. *Laccobius (Microlaccobius) indonesiae* GENTILI, 1979 (figs. 121, 125)

GENTILI 1979b: 47-48 (Indonesia, Java, Jogjakarta, holotype ISNB).

Distribution: LAOS, Vientiane (GENTILI 1979); Vientiane Province, Ban Van Euc (id.); VIETNAM, "Tonkin", Hoa Binh (id.); MALAYSIA; INDIA, West Bengal; INDONESIA, Java; Sumatra.

#### 7. *Laccobius (Microlaccobius) nepalensis* GENTILI, 1982 (figs. 128 - 129)

GENTILI 1982: 33 (Nepal, Lothar nr. Birganj, 150 m, holotype CNCO); 1988: 44.

Distribution: NEPAL, type locality; Abhabhar, nr. Simra, 200 m (GENTILI 1982); Kathmandu, 1 ♀, leg. M. Satô, 18.-27.IX.1979 (CMSN); Central Nepal, Sauraha, leg. I. Jenis, 20.-25.V.1992, 1 ♀ (NMW); INDIA, West Bengal, Darjeeling District, Rang 580 m (GENTILI 1988); New Jalpai, Guri 175 m (id.).

#### 8. *Laccobius (Microlaccobius) fragilis* NAKANE, 1966 (figs. 159 - 160)

NAKANE 1966: 57 (Japan, Honshu, Aichi Pref., Moriyama, holotype CTN); GENTILI & CHIESA 1975: 60-61; GENTILI 1979: 45; 1988: 43; MATSUI 1986: 87; LEE, CHO & LEE 1988: 72-73.

Distribution: CHINA, Liaoning: 1 ♂ (NMW) CWBS loc. 100; SOUTH KOREA (LEE, CHO & LEE 1988); JAPAN, Honshu, Shikoku, Kyushu.

#### 9. *Laccobius (Microlaccobius) oscillans* SHARP, 1884 (figs. 132 - 133)

SHARP 1884: 455 (Japan, Hokkaido, Hakodate, lectotype NHML by GENTILI & CHIESA 1975); GENTILI & CHIESA 1975: 56-57; GENTILI 1982: 33; 1988: 43; LEE, CHO & LEE 1988: 73; SHATROVSKIY 1984: 312; 1989: 292. *nipponicus* GENTILI, 1979a: 43-44 (Japan, Mt. Kirishima, holotype NHML; synonymy by GENTILI 1988).

Distribution: CHINA, Jilin: 49 ♂♂ 57 ♂♂ (NMW, MSNV) CWBS loc. 76, 77, 94, 95; Beijing (GENTILI 1982); RUSSIA, Primorye, Vladivostok, Botsad, River Ussuri (GENTILI & CHIESA 1975, with some doubt); NORTH KOREA, Sokam, NW Sunan, 1 ♀, leg. Josifov, 28.VIII.1970 (CFH); SOUTH KOREA (LEE, CHO & LEE 1988); JAPAN, Hokkaido; Honshu; Kyushu; Shikoku.

#### 10. *Laccobius (Microlaccobius) formosus* GENTILI, 1979 (figs. 130 - 131)

GENTILI 1979b: 48 (CHINA, Taiwan, "Taihoku" [= Taipei], holotype BMH); 1984: 31; 1988: 44; 1989: 39; SHATROVSKIY 1984: 312; 1989: 292.

Distribution: CHINA, Shaanxi, Xian (GENTILI 1984); Taiwan, type locality; S Taiwan, "Liu Kui" [= Lioquiu] and vicinity (GENTILI 1989); S Taiwan, Shi Nan Shan, Kaohsiung Hsien (id.); Fukukoo, Toen Ken (id.); Shijukei spa, Heito Ken (id.); Antung spa, Hualien (id.); Chipon (id.); Hutieku (id.); Nanshanxi (id.); Ilan Hsien, Luenbei, M.L. "Jang" [= Jeng] 29.III.1991, 4 ♂♂ 5 ♀♀ (NTU, NMW, MSNV); RUSSIA, Primorye, Kamenushka near Ussurijsk (SHATROVSKIY 1984); NORTH VIETNAM, Sapa [= Lao Cai] 22°20'N 103°50'E, leg. E. Jendek, 25.V.-10.VI.1991, 1 ♂ 1 ♀

(NMW, MSNV); THAILAND, Trang Province, Khaophappa Khaochang 200 - 400 m, G.A. Samuelson 12.I.1964 light trap, 2 ♂♂ 3 ♀♀ (BMH, MSNV).

**11. *Laccobius (Microlaccobius) florens* GENTILI, 1979 (figs. 134 - 135)**

GENTILI 1979b: 48 (China, Fujian, Shao Wu 500 m, holotype ISNB); 1988: 44.

Distribution: CHINA, type locality; Shandong nr. Jinan Shi (GENTILI 1979b); Guangdong, Guangzhou (GENTILI 1988).

**12. *Laccobius (Microlaccobius) elegans* GENTILI, 1979 (figs. 136 - 137)**

GENTILI 1979a: 46-47 (China, Yunnan, holotype ISNB); 1979b: 42-43.

Distribution: CHINA, type locality; Shaanxi, Hua Shan (GENTILI 1979a); Henan, "Lin Hsien" (id.); Henan, Luoyang (id.); Shandong, Jinan Shi (id.); Fujian, Shaowu, "Shupei-kai" (id.); THAILAND, Chiangmai, Chiangdao 450 m (id.); VIETNAM, S Hanoi, Hoa Binh (id.).

**13. *Laccobius (Microlaccobius) hammondi* GENTILI, 1984 (figs. 142 - 143)**

GENTILI 1984: 31-32 (China, Shaanxi, Nan Wutai, 32 km S Xian, holotype CASB); 1989: 39.

Distribution: CHINA, type locality; Hunan: 16 ♂♂ 18 ♀♀ (NMW, MSNV) CWBS loc. 23, 24; Taiwan: Nanshanxi (GENTILI 1989); Fukukoo, Toen-Ken (id.); Antung spa, Hualien (id.); Ilan Hsien, Luenbei, leg. M.L. Jeng, 29.III.1991, 1 ♂ 3 ♀♀ (NMW, NTU).

**14. *Laccobius (Microlaccobius) tonkinensis* GENTILI, 1979 (figs. 146 - 147)**

GENTILI 1979b: 42 (North Vietnam, Tonkin, Hoa Binh region, holotype MHNP); 1988: 44; 1991: 389.

Distribution: VIETNAM, type locality; "Tonkin", Pa Ham (GENTILI 1979b); "Annam", Quang Nam Province, Da Nang, Monkey m. 200 m (GENTILI 1988); THAILAND, Central Region, Saraburi (GENTILI 1991); West Region, NW Kanchanaburi, Sai Yok Yai NP, leg. M. Jäch, 2.XII.1990, 1 ♂ (NMW); Northwest Region, Mae Hong Son, Huai Sua Tao, leg. J. Strnad 11.-17.V.1992, 7 ♂♂ 3 ♀♀ (NMW, MSNV).

**15. *Laccobius (Microlaccobius) kaszabi* CHIESA, 1966 (figs. 140 - 141)**

CHIESA 1966: 300-301 (NE Afghanistan, Nuristan, Bashgultal 1100 m, holotype HMNH); GENTILI & CHIESA 1975: 80-81; GENTILI 1982: 34.

Distribution: AFGHANISTAN NE, type locality; Khinjan, Andarabtal (GENTILI & CHIESA 1975); PAKISTAN, Azad Kashmir, Sind Valley, Kangan 2000 m (GENTILI 1982); INDIA, Kashmir, Gilgit 1500 m (id.).

**16. *Laccobius (Microlaccobius) sinicus* GENTILI, 1975, new status (figs. 144 - 145)**

*sublaevis sinicus* GENTILI, 1975: 129-130 (China, "Turkestan, King Schewer, Kashgar" [= Xinjiang, nr. Kashi] 2000 m, holotype ZMUB); GENTILI & CHIESA 1975: 81-82.

Distribution: CHINA, type locality.

**17. *Laccobius (Microlaccobius) sublaevis* SAHLBERG, 1900 (figs. 148 - 149, 161)**

J. SAHLBERG 1900: 189 (Kirgizstan, Tokmak, Tschu River, holotype ZMH); ZAITZEV 1908b: 395; 1938: 114;

JACOBSON 1911: 856; KNISCH 1924a: 191; GENTILI & CHIESA 1975: 81-82; GENTILI 1979b: 42; 1989: 38; SHATROVSKIY 1984: 312.

Distribution: KAZAKHSTAN, Dzhambul [= Aulic Ata], Syr Darya (GENTILI & CHIESA 1975); KIRGIZSTAN, type locality; Gultsha, Alaj Mountains 1600 m (id.); TADZHIKISTAN, Ramit Ravine, Kafirnigan River (SHATROVSKIY 1984); UZBEKISTAN, Zarafshan, Tashkent (id.); INDIA: Uttar Pradesh, Mussourie, Mossy Falls (GENTILI 1979b); Dehra Dun, Rispana River (id.); Kumaon, W Almora (id.); Punjab, Parbatti Valley, Kulu (id.); NEPAL: Karnali, Jumla 2450 m (GENTILI 1989); Gandaki, Pokhara 40 km NW, Ghorapani 3000 m (id.).

### 18. *Laccobius (Microlaccobius) problematicus* GENTILI, 1988 (figs. 150 - 151)

GENTILI 1988: 35-36 (India, Uttar Pradesh, Kumaon, W Almora, holotype NHML).

Distribution: INDIA, Uttar Pradesh, type locality; Dehra Dun, Song River (GENTILI 1988); Central Almora (id.); Gangani 1250 m, leg. M. Brancucci, 13-20.VI.1981, 1 ♂ 1 ♀ (NHMB); West Bengal, Darjeeling District, Gorubathan 185 m (GENTILI 1988); Darjeeling District, Rang 580 m, leg. Bhakta, 23-24.3.1983, 1 ♀ (NHMB); NEPAL, nr. Hetauda (GENTILI 1988); Gandaki, Birethanti 1100 m, 30 km NW Pokhara (id.); Koshi, Thamur Valley, Dhankuta-Hile 1150 - 2000 m, leg. M. Brancucci, 24-25.V.1983, 1 ♂ (NHMB); Janakpur, Ramechap District, Shivalaya 1800 m, leg. Tomokuni, 15.X.1979, 1 ♀ (CMSN); Janakpur, Dolakha, Tama Koshi 850 - 1100 m, leg. M. Brancucci, 24-29.V.1989, 1 ♀ (NHMB); BHUTAN, Sargham 1000 m (GENTILI 1988).

### 19. *Laccobius (Microlaccobius) mistus* GENTILI, 1989 (figs. 153 - 155)

GENTILI 1989: 35 (Nepal, Janakpur, Sindhu, Lamosangu 900 m, holotype NSMT).

Distribution: NEPAL, type locality; Kabhre, Chak Khola, Tini Odhar 730 m (GENTILI 1989); Kathmandu, Bagmati River 1350 m (id.); INDIA, West Bengal, Darjeeling District, Rang 580 m (id.).

### 20. *Laccobius (Microlaccobius) orientalis* KNISCH, 1924 (figs. 122 - 124)

KNISCH 1924b: 33 (India, Uttar Pradesh, Ranikhet, Kumaon Mountains, lectotype NHML by GENTILI & CHIESA 1975); SHATROVSKIY 1984: 311-312 (partim); GENTILI 1988: 43; HEBAUER 1991: 176. *gracilis orientalis*: GENTILI & CHIESA 1975: 75; GENTILI 1979b: 42 (partim); 1982: 34 (partim).

Distribution: INDIA, Uttar Pradesh, type locality; Kumaon, W Almora (GENTILI 1988); Kumaon, Central Almora (id.); Kumaon, Haldwani District (id.); Kumaon, Tanakpur (id.); Dehra Dun, Phandowala, Suswa River (id.); Kempty 1200 m (id.); Punjab, Parbatti Valley, Kulu 2000 - 2600 m (id.); Lori 700 m, Sullej River (id.); West Bengal, Darjeeling District, Sukna (id.); Darjeeling District, Gharap 1300 m (id.); NEPAL, Bagmati, Kathmandu (id.); Bagmati, N Kathmandu, Lamosangu (id.); Koshi, nr. Dahran (id.); Koshi, Dhankuta, Dharapani, 1000 m, M. SATÓ 4.XI.1979, 1 ♂ (CMSN); Gandaki, near Pokhara, Nau Danda, 2100 m, leg. M. Sakai, 12.X.1981, 1 ♀ (CMSN); Dhaulagiri, Mustang District, 2650 m, leg. Löbl & Smetana, 1.X.1983 (MHNG); Central Nepal, Gorkha, leg. I. Jenis, 26-31.V.1992, 1 ♂ 2 ♀ (NMW); Central Nepal, Kaski District, Suikhet, 1050 m, leg. M. Tomokuni, 12.X.1981, 1 ♂ (CMSN); BHUTAN, Sargham, 1000 m (GENTILI 1988); IRAN, Makran, Isin (id.); TADZHIKISTAN, Pamir Alai, Seravshan Valley nr. Novabad 1100 m (HEBAUER 1991); TURKMENISTAN, Mary, 20 km N Kushka, Ghindukush Mts, Paropamiz Ridge, Badghiz 800 m, leg. P. Cechovsky, 30.III-6.IV.1992 (MSNV).

### 21. *Laccobius (Microlaccobius) quaesitus* GENTILI, 1988 (figs. 156 - 158)

GENTILI 1988: 35 (Central Iran, Kavir NP, holotype MSNV); 1989: 39.



Distribution: NEPAL, Kabhre, Chak Khola, Tini Odhar 700 m (GENTILI 1989); Janakpur, Sindhu, Bhote Kosi, Bahrabise 820 m (id.); PAKISTAN, Punjab, Salt Range, Khewra Gorge (GENTILI 1988); TURKMENISTAN, 12 km N Merw, Morgunovka, River Kuschka, leg. A.D. Dostal, 17.IV.1993, 1 ♂ 1 ♀ (NMW, MSNV); IRAN, Central; Khorasan; Fars; Makran; Sistan-Baluchestan.

## 22. *Laccobius (Microlaccobius) exilis* GENTILI, 1974 (figs. 138 - 139)

GENTILI 1974: 560-562 (NE Afghanistan, Nuristan, Bashgultal 1100 m, holotype MSNV); 1988: 44; 1991: 388; GENTILI & CHIESA 1975: 79 (partim). *orientalis* KNISCH, 1924; GENTILI & CHIESA 1975 (partim); SHATROVSKIY 1984: 311-312.

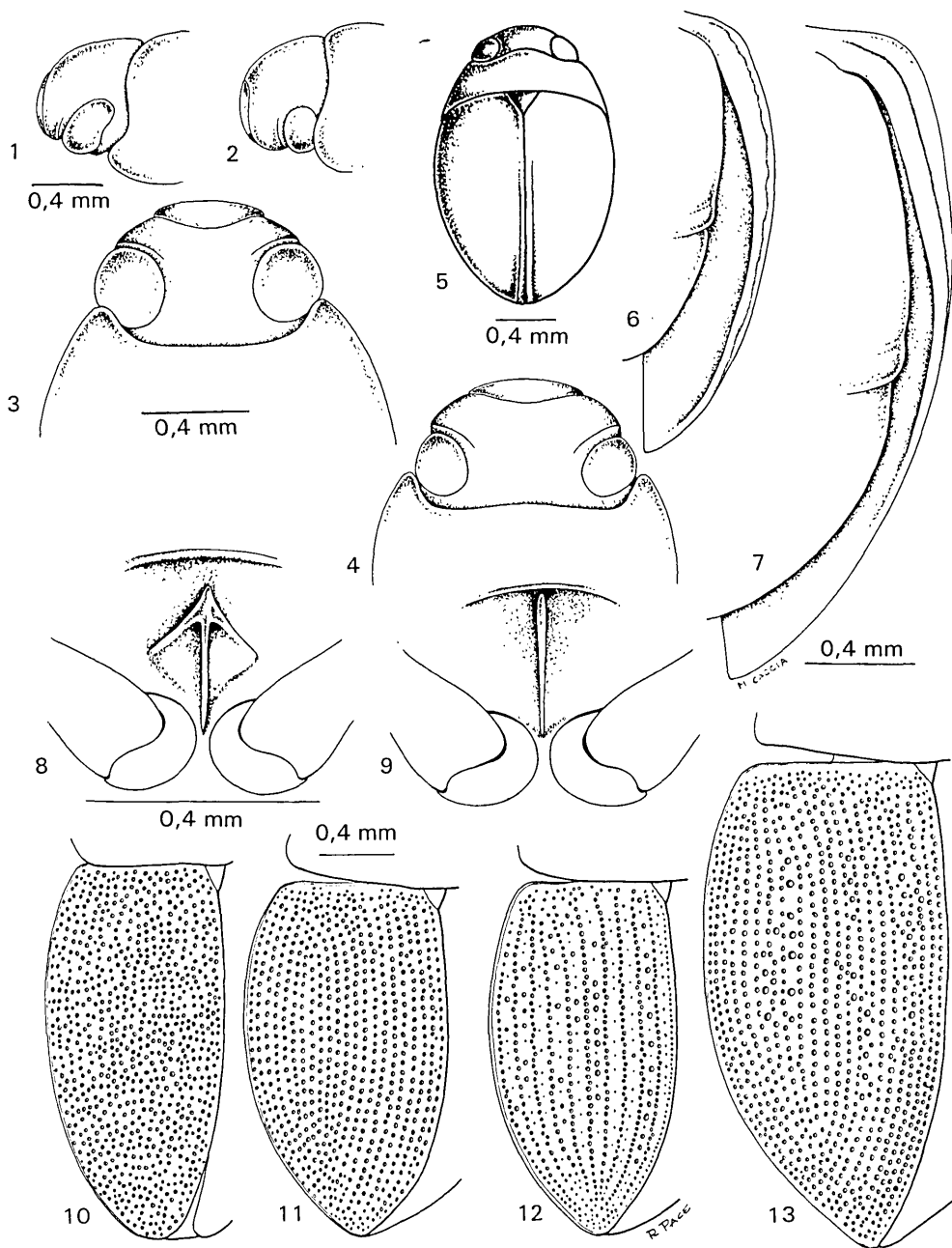
Distribution: TADZIKHISTAN, Javroz (GENTILI 1988); Hissar Dag, leg. F. Hauser, 1896, 2 ♀♀ (NMW, FMC); TURKMENISTAN (SHATROVSKIY 1984); UZBEKISTAN, E-Buchara, Tschitschantan (GENTILI 1991); Mts. Karateghin, Baldschuan, leg. F. Hauser, 1896, 1 ♀ (NMW); 6 km N Sherabad, leg. D. Král, 26.-28.IV.1988, 1 ♂ 1 ♀ (NHMB); AFGHANISTAN, type locality; PAKISTAN, Hazara, Lower Kagan Valley 1200 m (GENTILI 1988); INDIA, Uttar Pradesh, Kumaon, Haldwani Div. (id.); Kumaon, West Almora (id.); Kumaon, Ranikhet, leg. H.G. Champion, 1 ♂ 1 ♀ (NHML); Dehra Dun, River Song (GENTILI 1988); Kempty 1200 m (id.); Punjab, Lori, River Sutlej 500 m (id.); West Bengal, Darjeeling District, Gharap 1300 m (id.); Darjeeling District, Gorubathan 180 m (id.); Darjeeling District, Khani Khola 600 m, leg. B. Bhakta, 1.IV.1983, 1 ♂ (NHMB); Darjeeling District, Rally Khola 600 m, leg. B. Bhakta, 9.X.1981, 3 ♂♂ 4 ♀♀ (NHMB, MSNV); NEPAL, Gandaki, Tatopani 1200 m, 55 km NW Pokhara (GENTILI 1988); Birethanti 1100 m, 30 km NW Pokhara (id.); Bagmati, Kathmandu Valley, Godawari 1500 m, leg. M. Brancucci, 23.V.1985, 1 ♀ (NHMB); Janakpur, Lamosangu 900 m, Sindhu, leg. M. Satô, 18-21.X.1979, 1 ♀ (CMSN); Tini Odhar, Chak Khola 730 m, Kabhre, leg. M. Satô, 9.XI.1979, 1 ♀ (CMSN); Central Nepal, Gorkha, leg. I. Jenis, 26-31.V.1992, 1 ♂ 2 ♀♀ (NMW); BHUTAN, Phuntsholing 200 - 400 m (GENTILI 1988); Sargham 1000 m (id.); TURKEY, CYPRUS.

## Acknowledgements

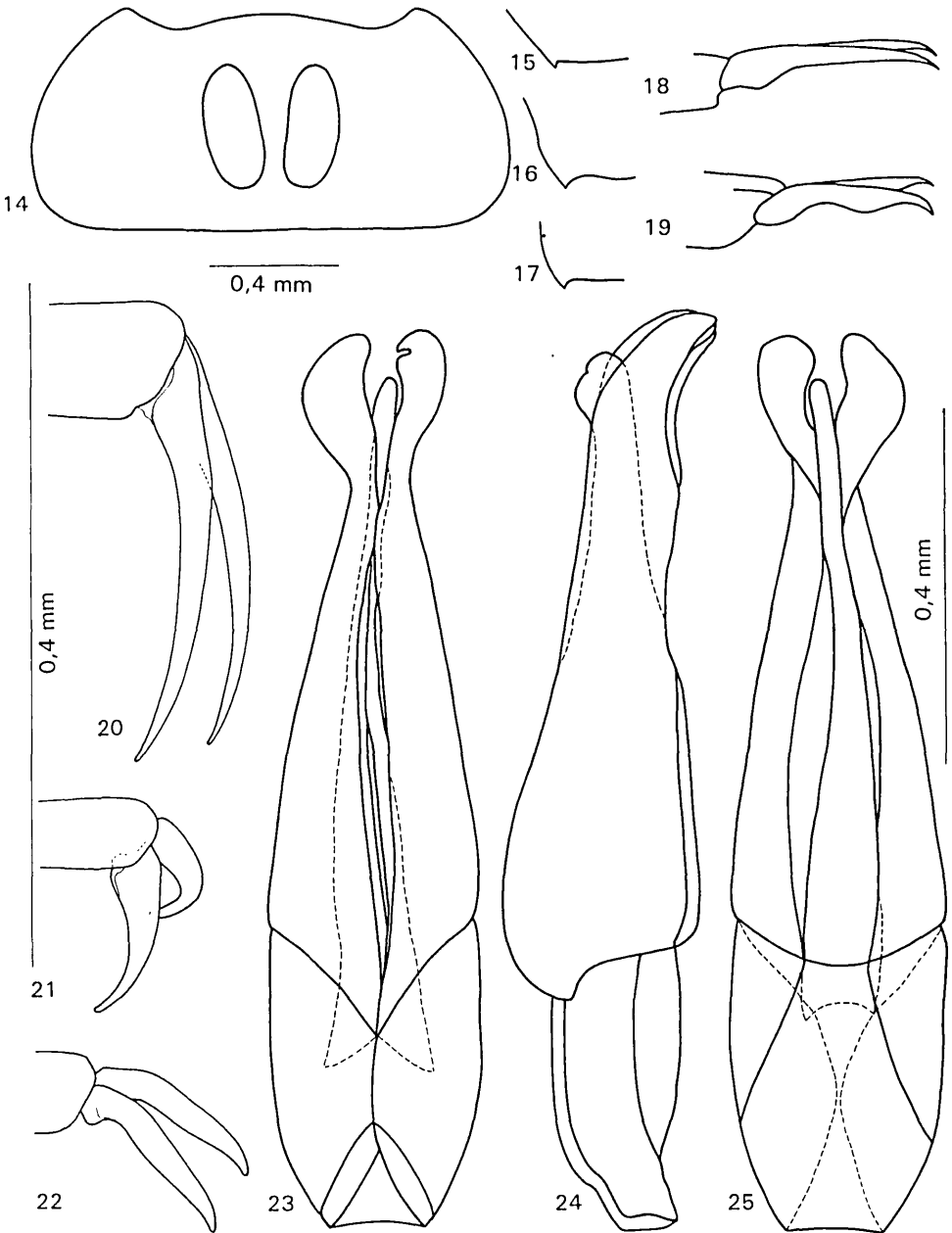
I wish to thank Mrs. Manuela Caccia (Milan) for the production or revision of most figures; Dr. Manfred Jäch (NMW) and Prof. Lanzhu Ji (CASS) for the proposition of this work and for the useful suggestions; Dr. Garth Foster (the Balfour-Browne Club) for the English language revision; Dr. Franz Hebauer (Deggendorf) for the gift of some specimens; Dr. Stuart J. Hine (NHML) for the loan of interesting specimens.

## References

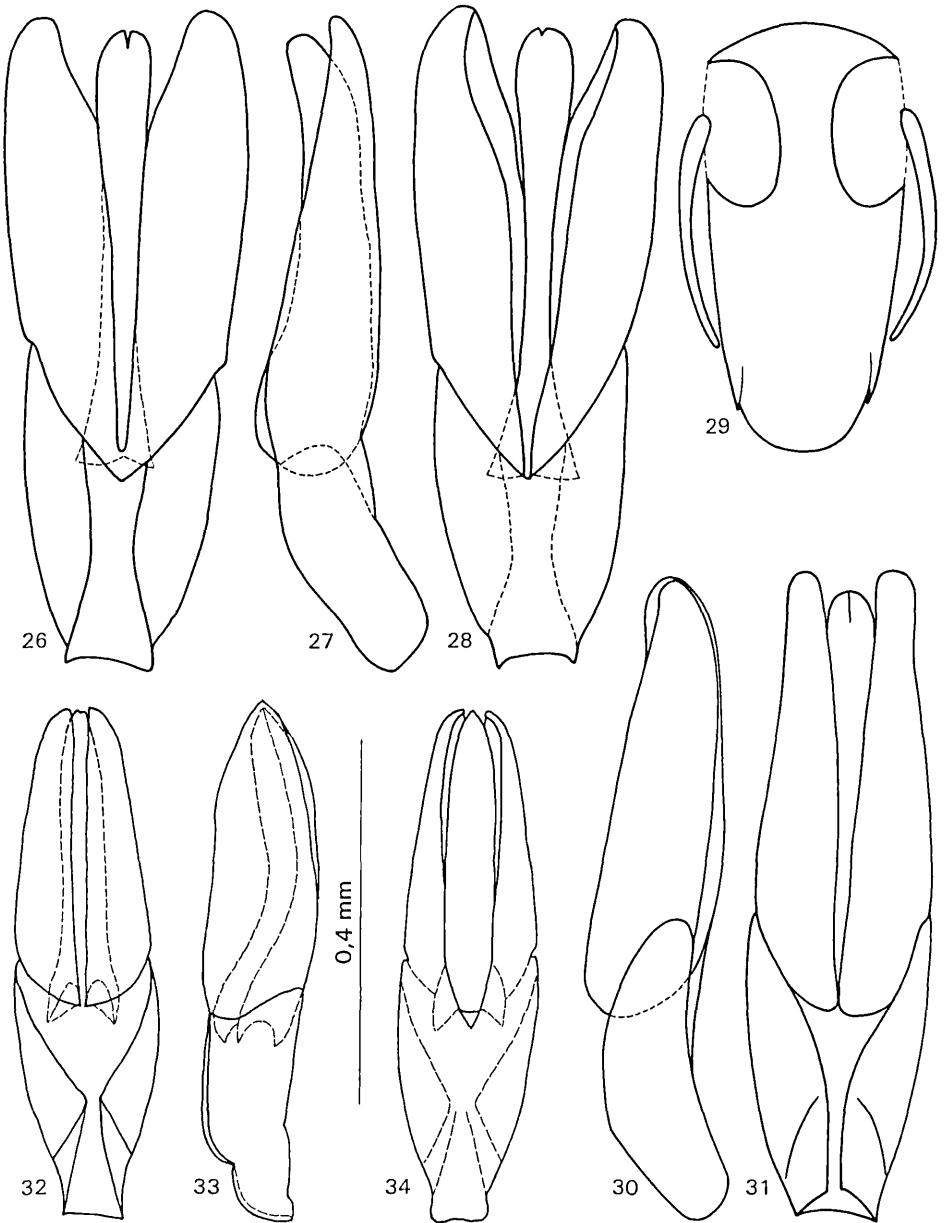
- BALFOUR-BROWNE, F. 1958: British Water Beetles, III. - London: Ray Society, 210 pp.  
BALFOUR-BROWNE, J. 1938: A contribution to the knowledge of the Palpicornia of Palestine. - Bull. Soc. Fouad I Ent. Cairo 22: 28-35.  
BALFOUR-BROWNE, J. 1946: The Aquatic Coleoptera of Manchuria (Weymarn Collection). - Ann. Mag. Nat. Hist., Ser. 11, 13 (103): 433-460.  
BERGE HENEGOUWEN, A.L. van 1982: De Nederlandse Soorten van het Genus *Laccobius* Erichson, een systematische en faunistische studie. - Bijdragen tot de Faunistiek van Nederland IX: 59-84, 4 pl.  
BERLOV, E.J. 1978: Water beetles (Coleoptera, Hydrophilidae) of Irkutsk Province. - Nasek. Vostochn. Sib.: 65-72 (in Russian).  
BLACKBURN, T. 1895: Further notes on Australian Coleoptera, with Descriptions of New Genera and Species. XVII. - Trans. R. Soc. S. Austr. 19: 27-60.  
CHEARY, B.S. 1971: The Biology, Ecology and Systematics of the genus *Laccobius* of the New World. - Riverside: University of California, 178 pp., 15 pl.



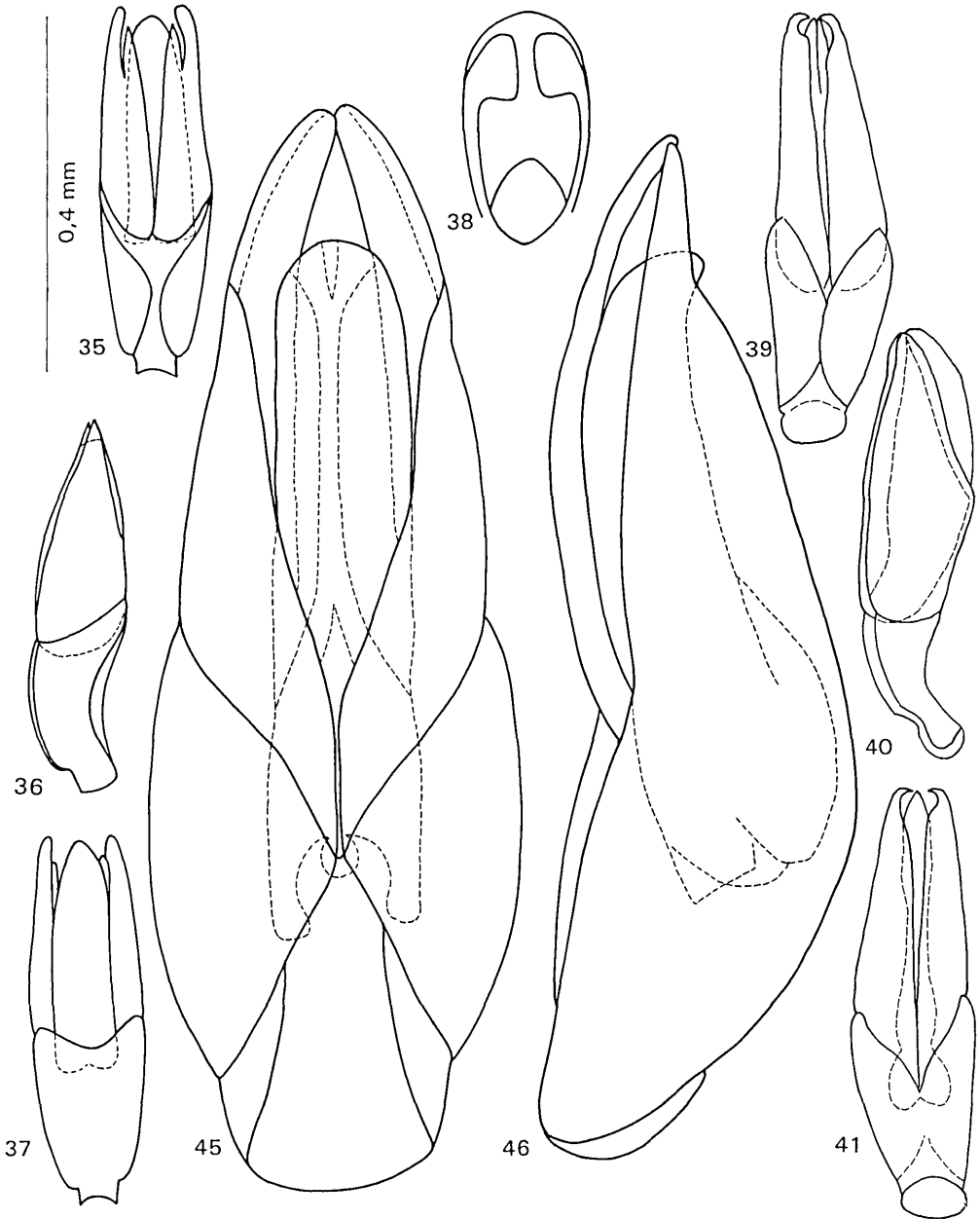
Figs. 1 - 13: 1) *Laccobius patruelis*, eyes, lateral view; 2) *L. ovatus*, eyes, lateral view; 3) id., dorsal view; 4) *L. kunashiricus*, eyes, dorsal view; 5) *L. incisus*, parasutural furrow, dorsal view; 6) *L. maculatus*, clytral epipleura, ventral view; 7) *L. zietzi*, clytral epipleura, ventral view; 8) *L. striatulus*, Poland, Gdansk, mesosternal keel, ventral view; 9) *L. biguttatus*, Great Britain, N Devon, Saunton, mesosternal keel, ventral view; 10) *L. femoralis*, elytral punctation; 11) *L. minutus*; elytral punctation; 12) *L. alternus*, elytral punctation; 13) *L. striatulus*; elytral punctation.



Figs. 14 - 25: *Laccobius decorus*, pronotum, dorsal view (after SHATROVSKIY 1984, redrawn; 15) *L. decorus*, mesosternal keel, lateral view; 16) *L. striatulus*, mesosternal keel, lateral view; 17) *L. gracilis*, mesosternal keel, lateral view; 18) *L. decorus*, metatarsal claws, lateral view; 19) *L. binotatus*, metatarsal claws, lateral view; 20) *Laccobius pommayi*, metatarsal claws, lateral view; 21) *L. minutus*, metatarsal claws, lateral view; 22) *L. albipes*, metatarsal claws, lateral view; 23) *L. celsus*, holotype, aedeagus, dorsal view; 24) id., lateral view; 25) id., ventral view.

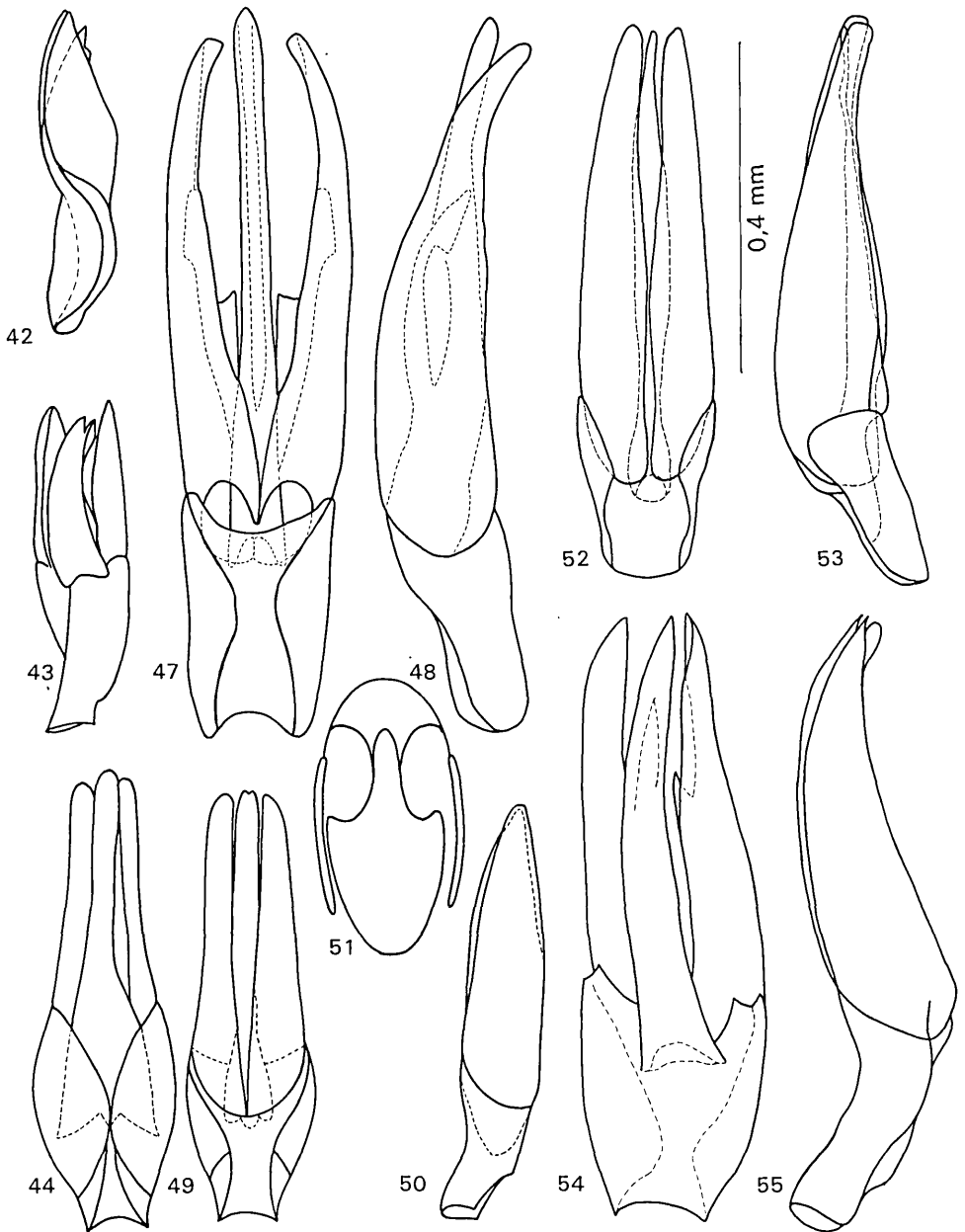


Figs. 26 - 34: *Laccobius mumus* sp.n., holotype, aedeagus, dorsal view; 27) id., lateral view; 28) id., ventral view; 29) id., spiculum gastrale; 30) *L. sharmai* sp.n., holotype, aedeagus, dorsal view; 31) id., lateral view; 32) *L. jacchi*, holotype, aedeagus, dorsal view; 33) id., lateral view; 34) id., ventral view.



Figs. 35 - 41: 35) *Laccobius egregius* sp.n., holotype, aedeagus, dorsal view; 36) id., lateral view; 37) id., ventral view; 38) id., spiculum gastrale; 39) *L. incisus*, holotype, aedeagus, dorsal view; 40) id., lateral view; 41) id., ventral view.

Figs. 45 - 46: 45) *Laccobius zugmayeri*, W Nepal, nr. Jumla, aedeagus, dorsal view; 46) id., lateral view.



Figs. 42 - 44: 42) *Laccobius affinis*, lectotype, aedeagus, ventral view; 43) id., lateral view; 44) *Laccobius cribratus*, holotype, aedeagus, dorsal view.

Figs. 47 - 55: 47) *Laccobius hingstoni*, aedeagus of *L. championi*, holotype, dorsal view; 48) id., lateral view; 49) *L. inermis* sp.n., holotype, aedeagus, dorsal view; 50) id., lateral view; 51) id., spiculum gastrale; 52) *L. nitidus*, holotype, aedeagus, dorsal view; 53) id., lateral view; 54) *L. regalis*, India, W Almora; 55) id., lateral view.

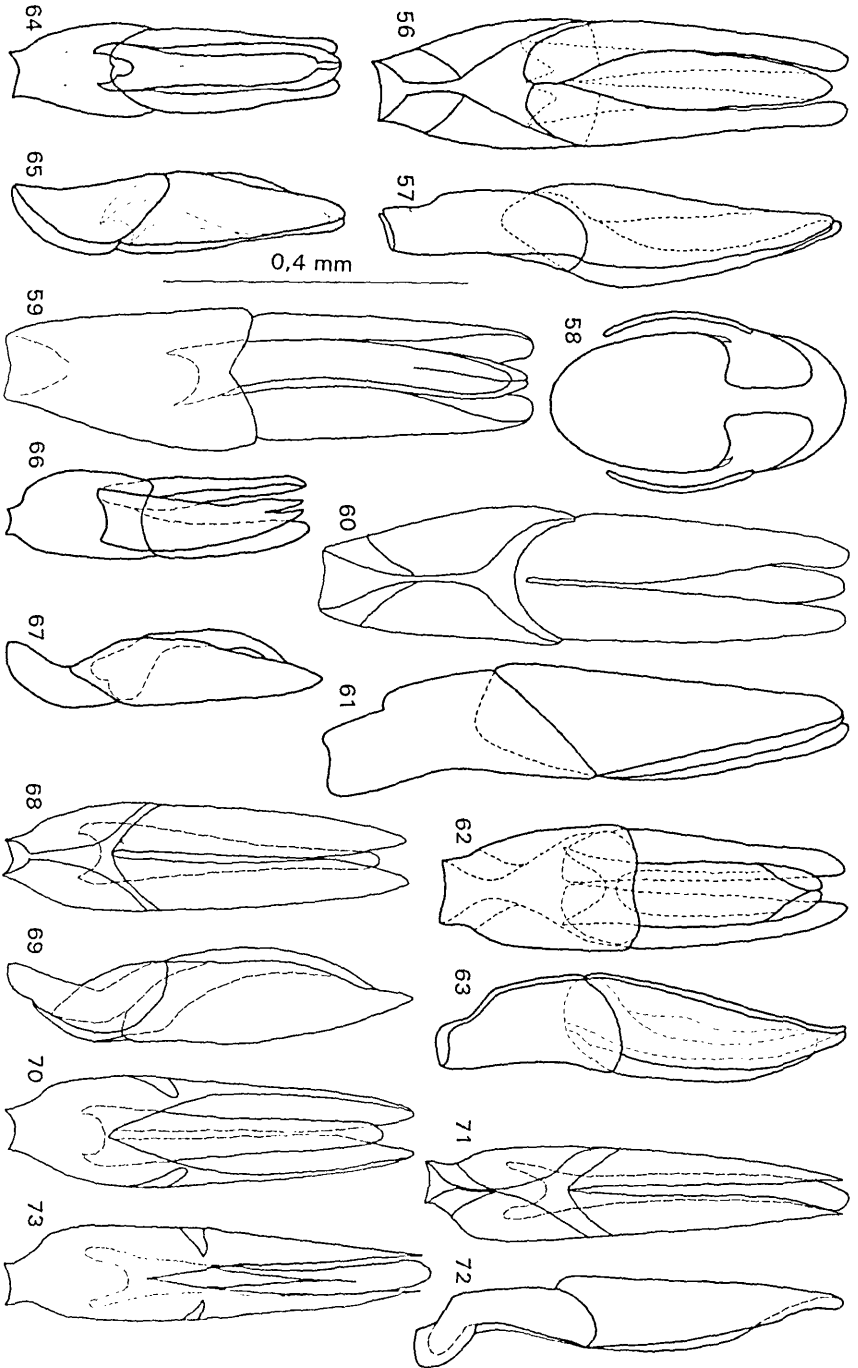
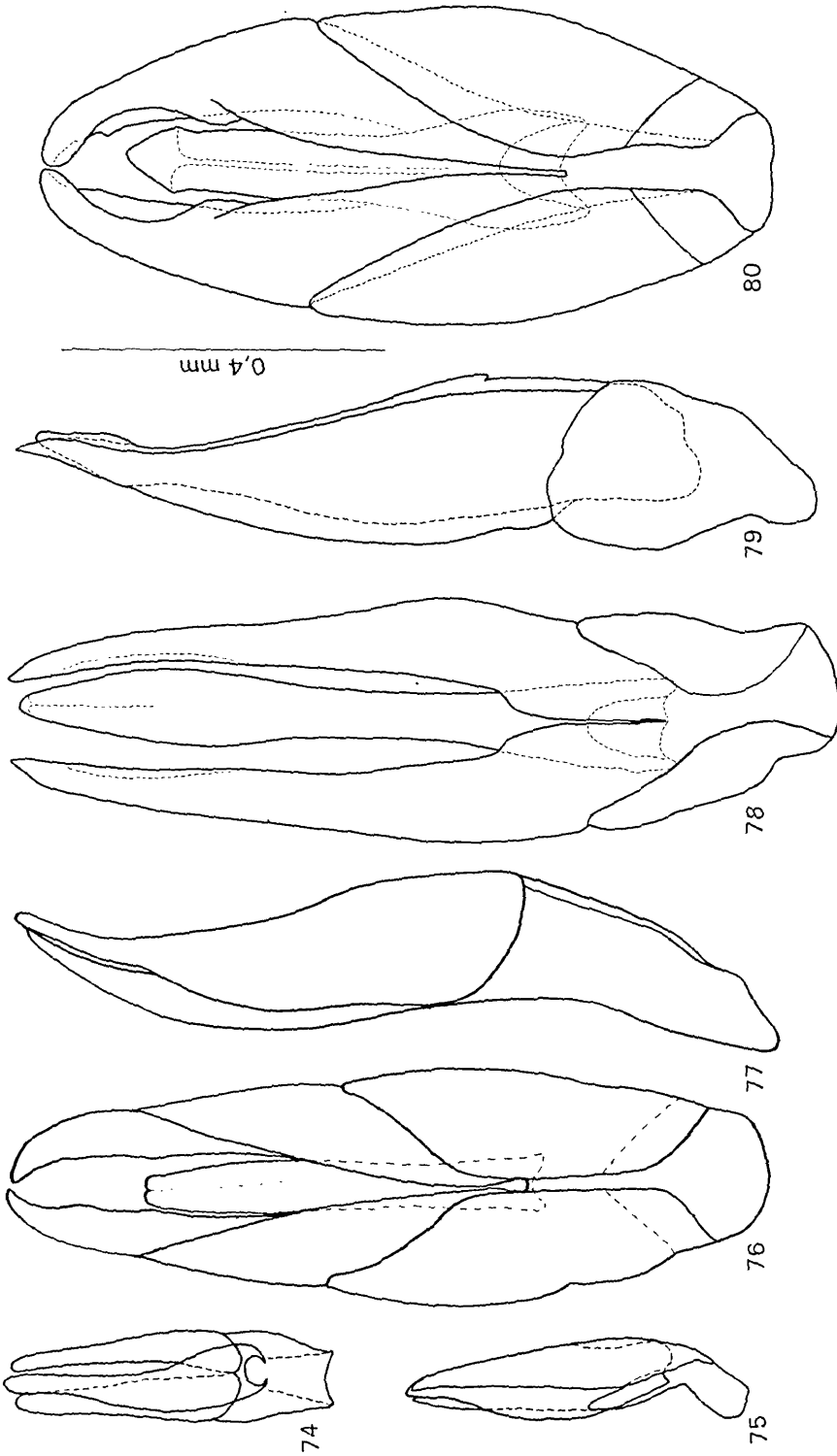
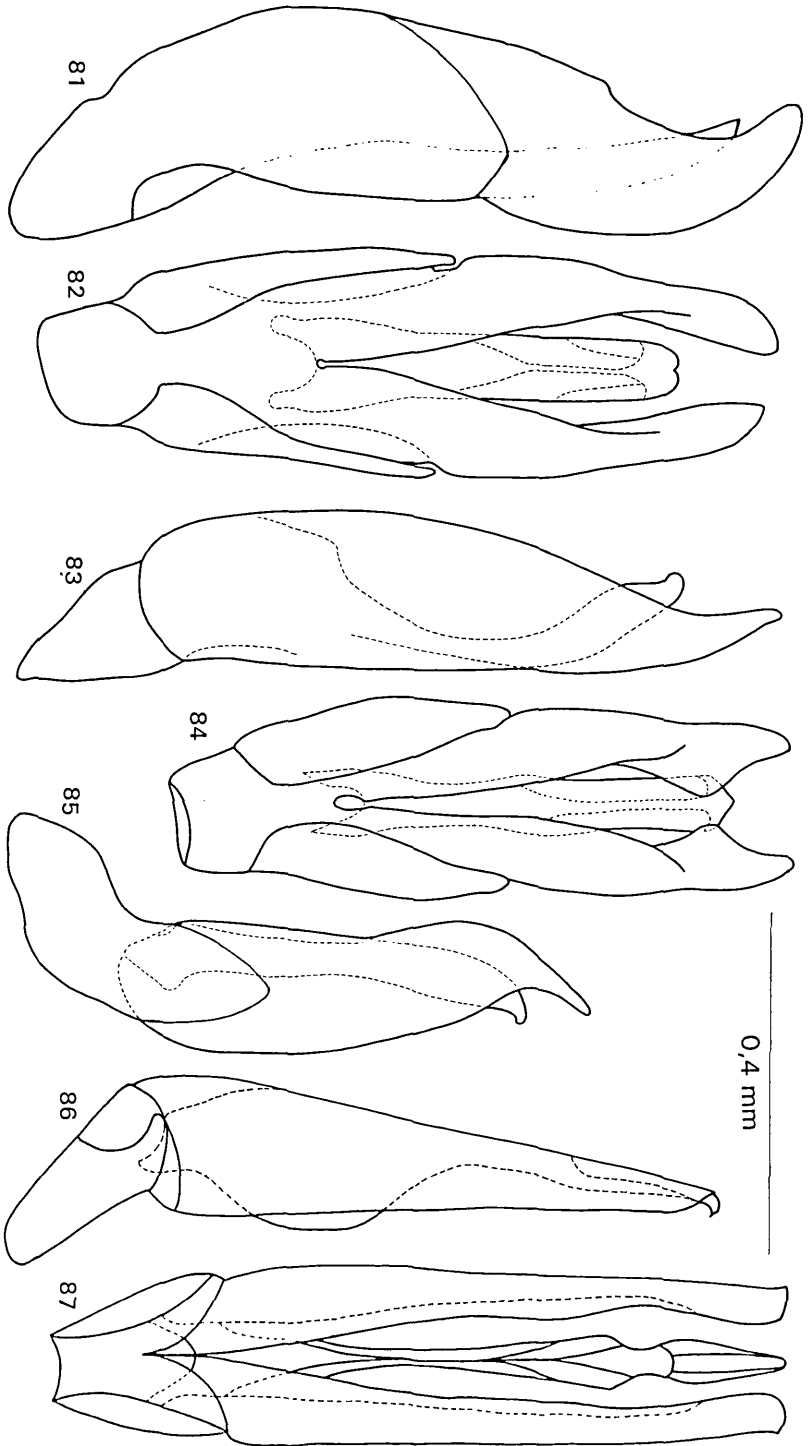


Fig. 56 - 73: 56) *Laccobius almonanus* sp.n., holotype, aedeagus, dorsal view; 57) id., lateral view; 58) id., spiculum gastrale; 59) *L. fuscus* sp.n., holotype, aedeagus, ventral view; 60) id., dorsal view; 61) id., lateral view; 62) *L. parvifelis*, India, Simla Hills, Gahan, aedeagus, ventral view; 63) id., lateral view; 64) *L. imperialis*, India, Dehra Dun, Kalligad, aedeagus, ventral view; 65) id., lateral view; 66) *L. bacchusii*, holotype, aedeagus, ventral view; 67) id., lateral view; 68) *Laccobius globulatus* sp.n., holotype, aedeagus, dorsal view; 69) id., lateral view; 70) id., ventral view; 71) *L. kumaonensis*, holotype, aedeagus, dorsal view; 72) id., lateral view; 73) id., ventral view.

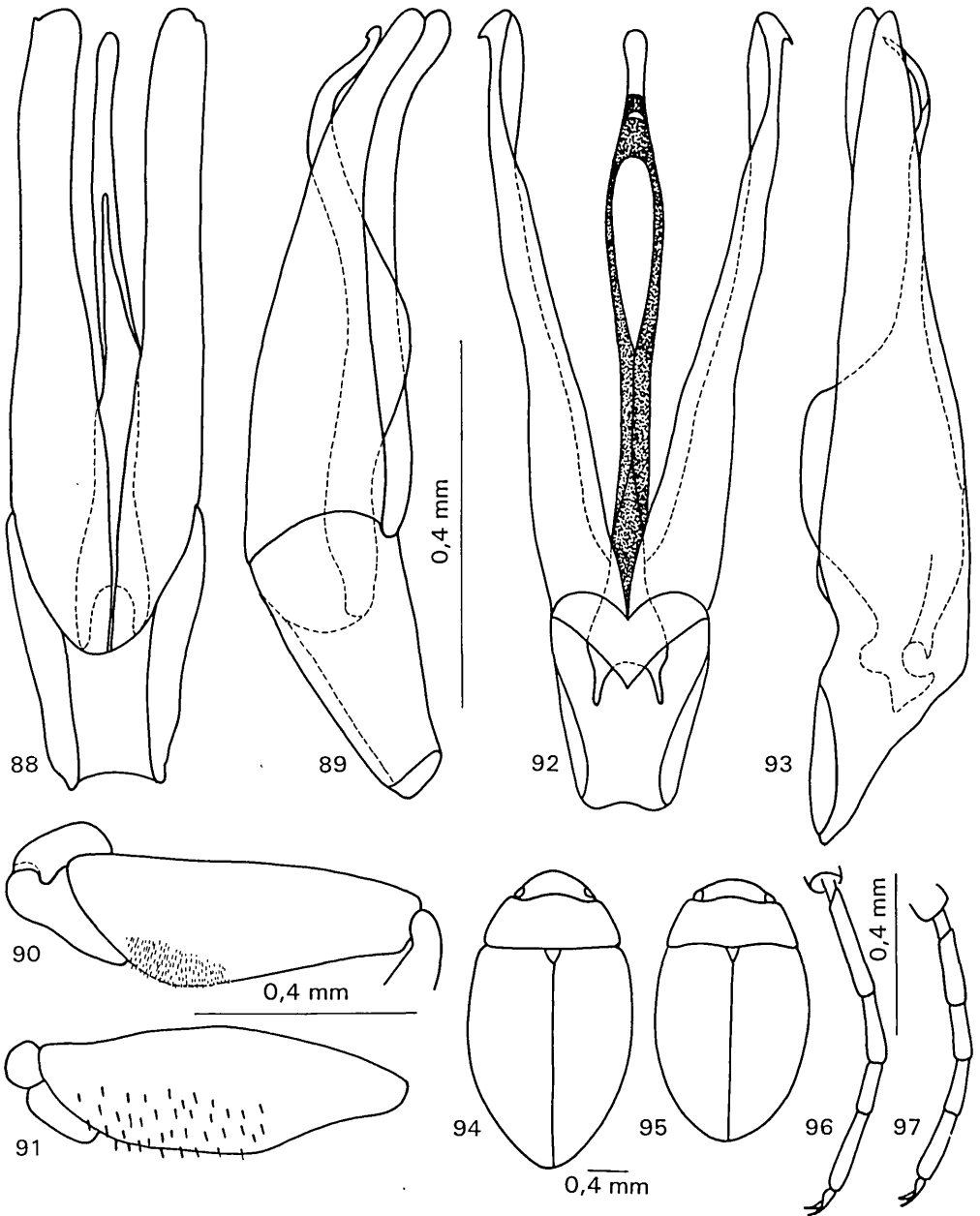


Figs. 74 - 80: 74) *Laccobius politus*, holotype, aedeagus, ventral view; 75) id., lateral view; 76) *L. kashmitrensis*, India, Kashmir, Wuhlar Lake, Aedeagus, dorsal view; 77) id., lateral view; 78) *L. bipunctatus*, Italy, Puglia, Laghi Alimminia, aedeagus, dorsal view; 79) id., lateral view; 80) *L. striatulus*, France, Castres, aedeagus, dorsal view.

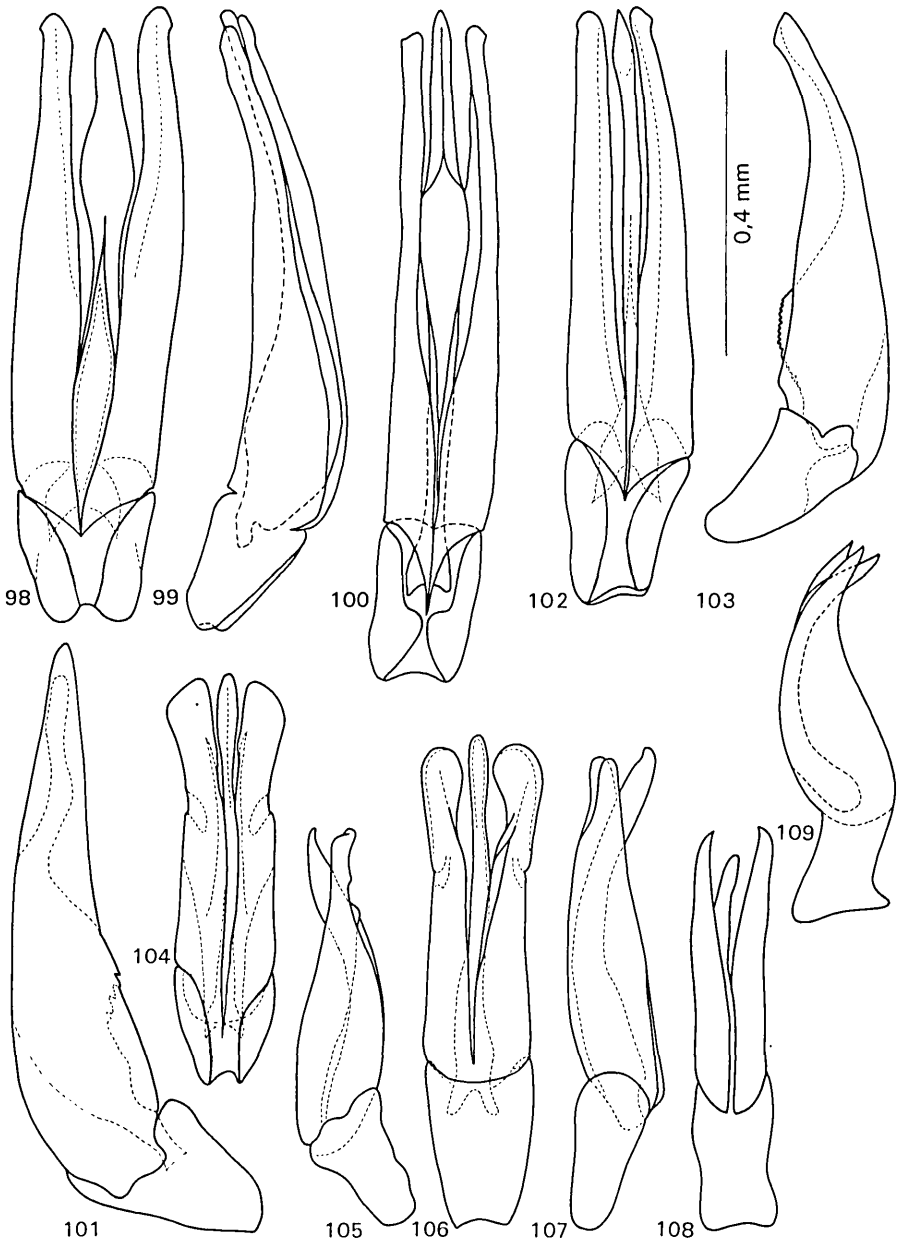




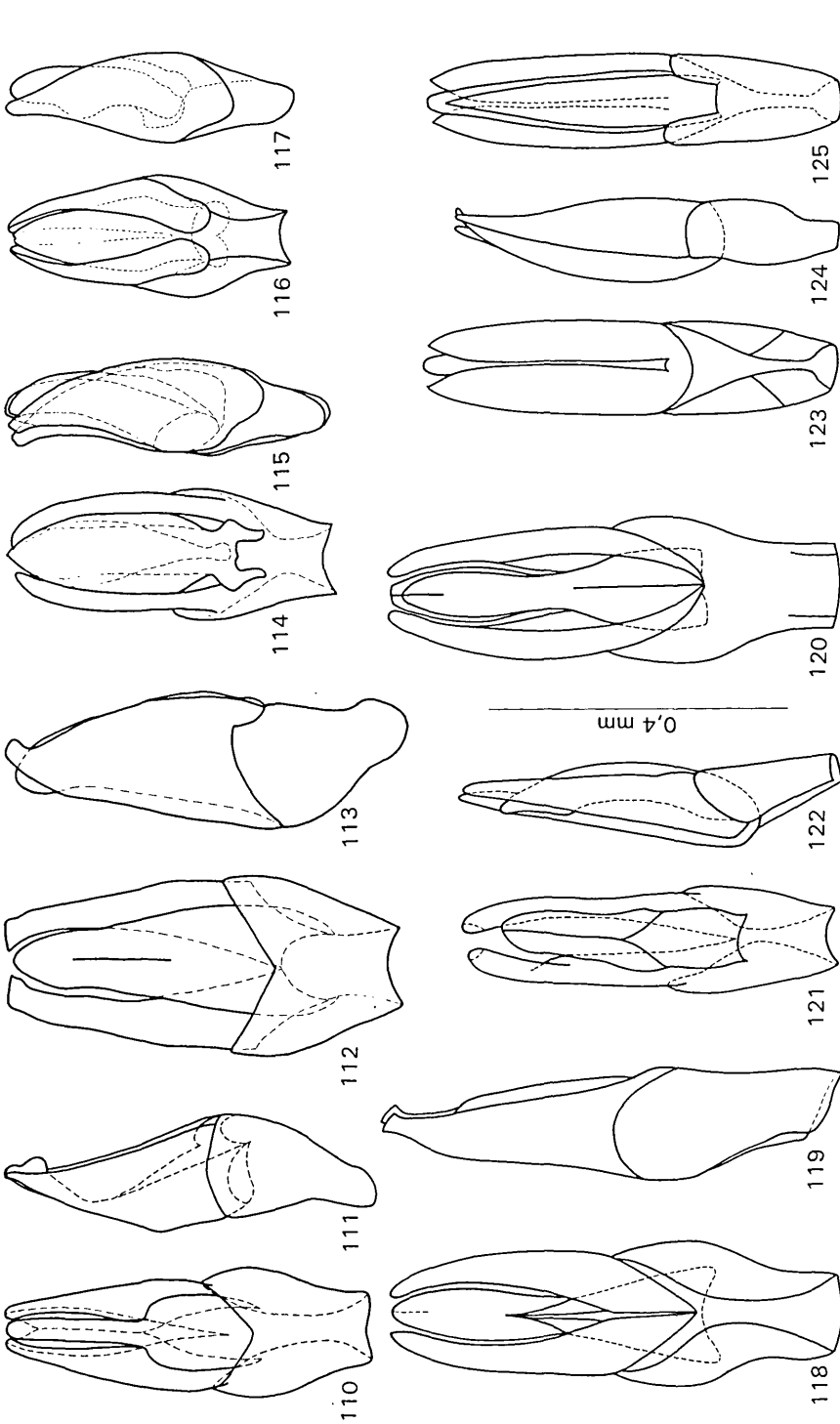
Figs. 81 - 87: 81) *Laccobius striatulus*, France, Castres, aedeagus, lateral view; 82) *L. similans*, holotype of *L. kritschii*, aedeagus, dorsal view; 83) *L. similans*, holotype of *L. kritschii*, aedeagus, dorsal view; 84) *L. hindukuschi*, Afghanistan, Ejan, aedeagus, dorsal view; 85) *L. hindukuschi*, Afghanistan, Ejan, aedeagus, lateral view; 86) *L. kumashirensis*, holotype, aedeagus, dorsal view (after SHATROVSKIY 1984, redrawn); 87) *L. kumashirensis*, holotype, aedeagus, dorsal view (after SHATROVSKIY 1984, redrawn).



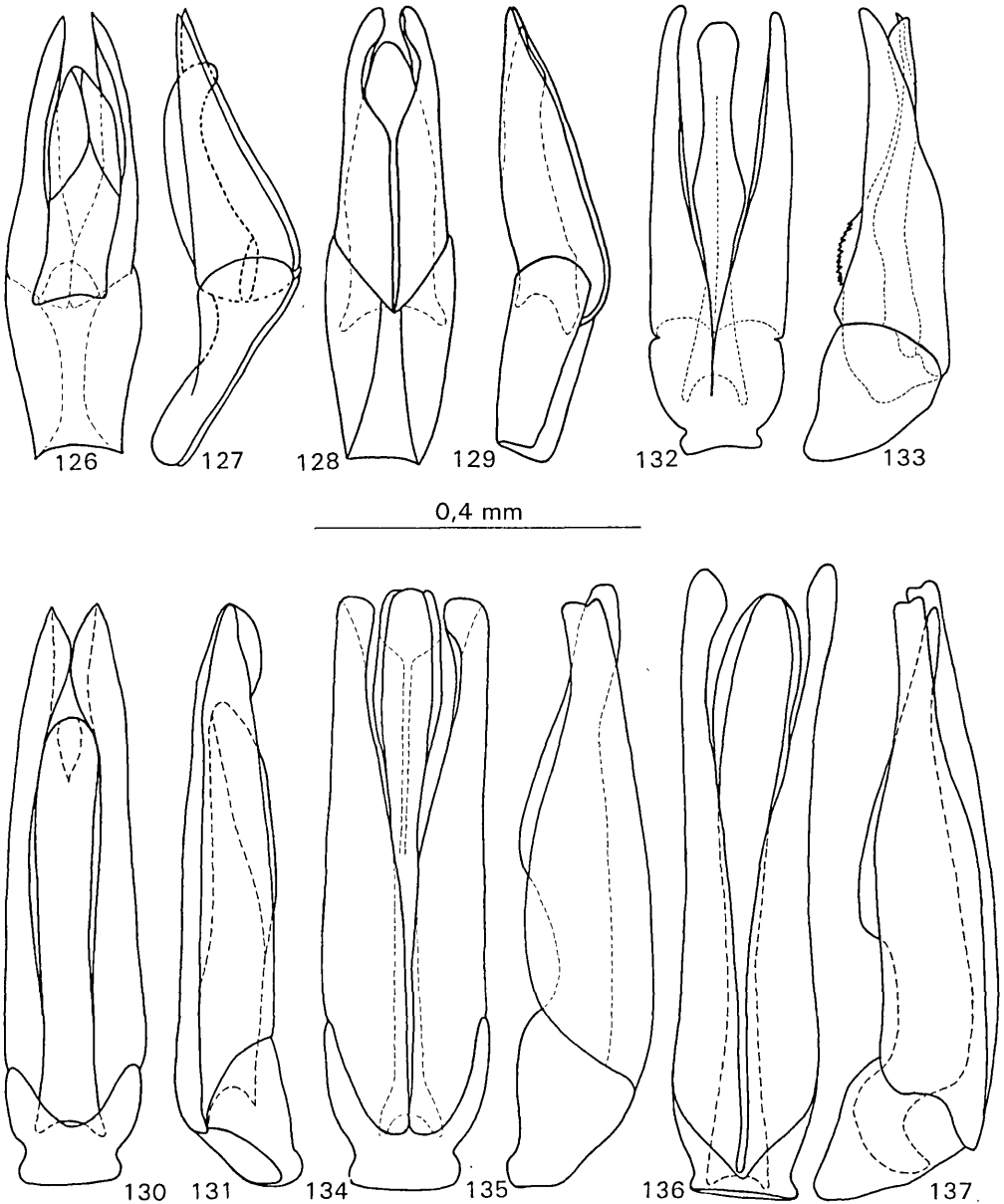
Figs. 88 - 97: 88) *Laccobius binotatus*, Russia, Ussuri, Vladivostok, aedeagus, dorsal view; 89) id., lateral view; 90) *L. striatulus*, mesofemur, ventral view; 91) *L. binotatus*, mesofemur, ventral view (after SHATROVSKIY 1984, redrawn); 92) *L. inopinus*, holotype of *L. miyuki*, aedeagus, dorsal view (after MATSUI 1986, redrawn); 93) *L. inopinus*, aedeagus, lateral view (after SHATROVSKIY 1984, as *L. nobilis*, redrawn); 94) *L. cinereus*, body form, dorsal view; 95) *L. minutus*, body form, dorsal view; 96) *L. nobilis*, metatarsus, dorsal view; 97) *L. biguttatus*, metatarsus, dorsal view.



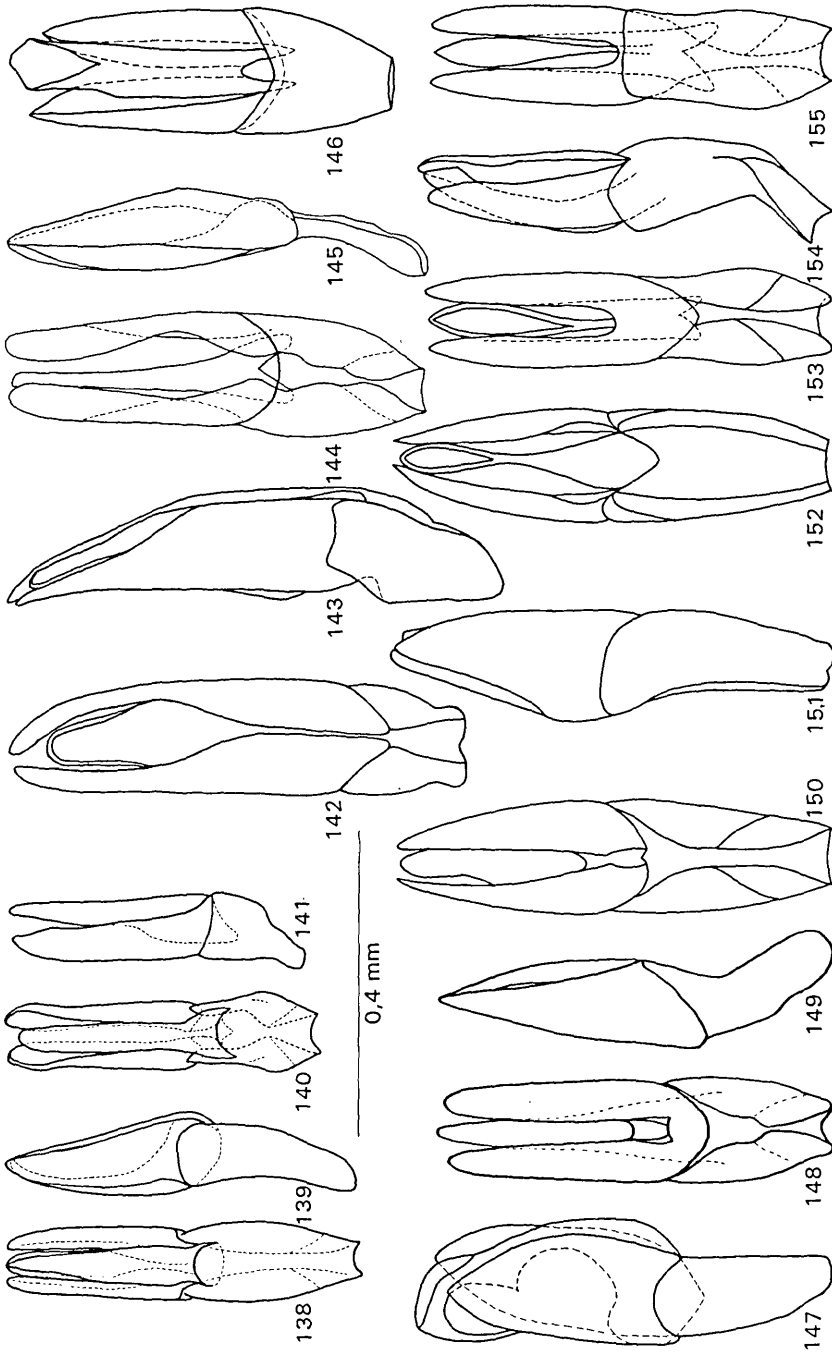
Figs. 98 - 109: 98) *Laccobius bedeli*, Japan, Nagoya, aedeagus, dorsal view; 99) id., lateral view; 100) *L. nobilis*, holotype, aedeagus, lateral view; 101) id., dorsal view; 102) *L. minutus*, France, Brout-Vernet, aedeagus, dorsal view; 103) id., lateral view; 104) *L. biguttatus*, France, Cinglais, aedeagus, dorsal view; 105) id., lateral view; 106) *L. cinereus*, holotype of *L. littoralis*, aedeagus, ventral view; 107) id., lateral view; 108) *L. expectans*, holotype, aedeagus, ventral view; 109) id., lateral view.



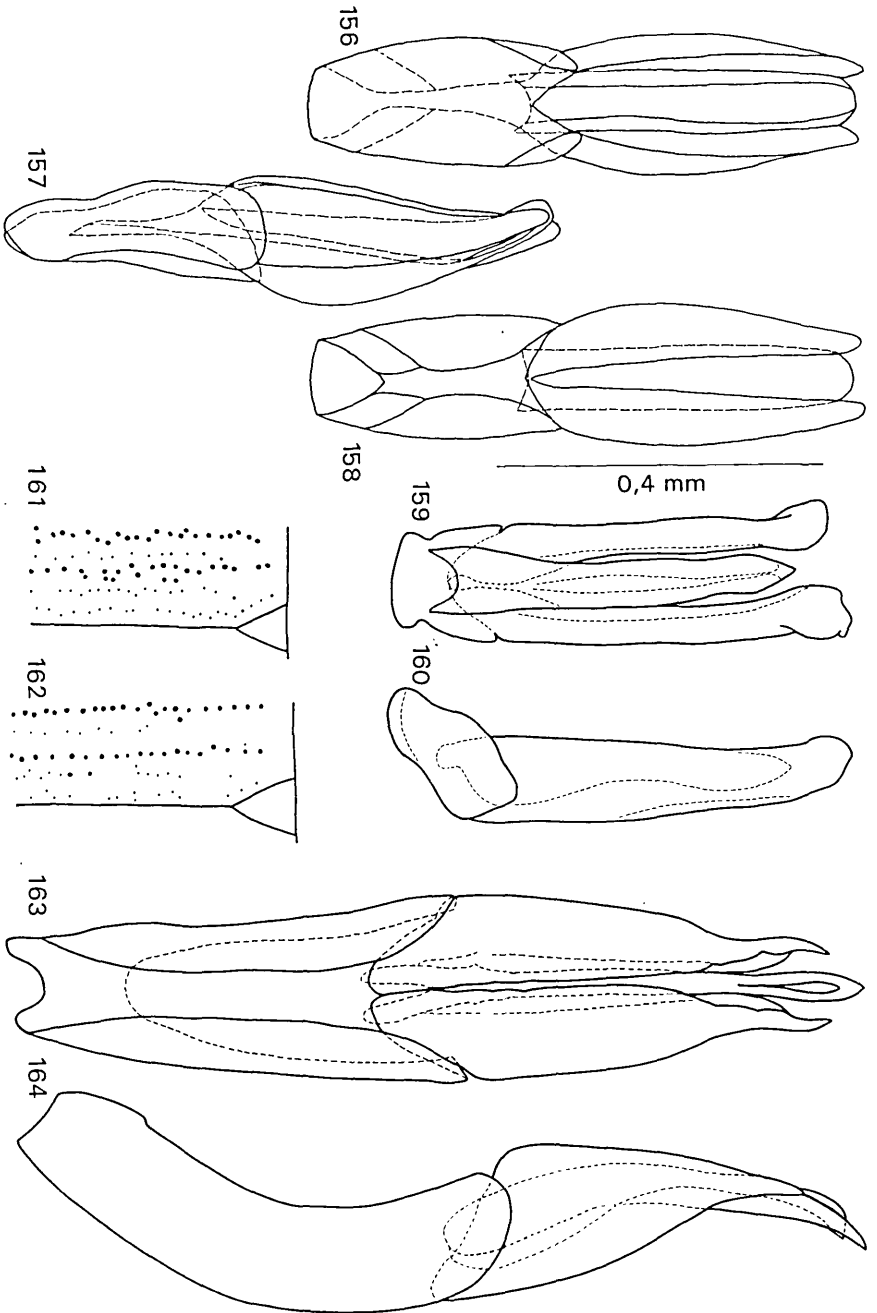
Figs. 110 - 125: 110) *Laccobius laotianus*, holotype, aedeagus, ventral view; 111) id., lateral view; 112) *L. gangeticus*, holotype, aedeagus, ventral view; 113) id., lateral view; 114) *L. argillaceus*, India, Hardwar, aedeagus, ventral view; 115) id., lateral view; 116) *L. argillaceus*, lectotype (Tadzhikistan); aedeagus, dorsal view; 117) id., lateral view; 118) *L. himalayanus*, holotype, aedeagus, dorsal view; 119) id., lateral view; 120) id., ventral view; 121) *L. indonesiæ*, holotype, aedeagus, ventral view; 122) id., lateral view; 123) *L. orientalis*, lectotype, aedeagus, dorsal view; 124) id., lateral view; 125) id., ventral view.



Figs. 126 - 137: 126) *Laccobius roseiceps*, holotype, aedeagus, ventral view; 127) id., lateral view; 128) *L. nepalensis*, holotype, aedeagus, dorsal view; 129) id., lateral view; 130) *L. formosus*, holotype, aedeagus, ventral view; 131) id., lateral view; 132) *L. oscillans*, Japan, Ohnuma Kitayama, aedeagus, ventral view; 133) id., lateral view; 134) *L. florens*, holotype, aedeagus, ventral view; 135) id., lateral view; 136) *L. elegans*, Vietnam, Hoa Binh, aedeagus, ventral view; 137) id., lateral view.



Figs. 138 - 155: 138) *Laccobius exilis*, holotype, aedeagus, ventral view; 139) id., lateral view; 140) *L. kaszabi*, Afghanistan, Nuristan, Bashgullal, aedeagus, ventral view; 141) id., lateral view; 142) *L. lammondi*, holotype, aedeagus, dorsal view; 143) id., lateral view; 144) *L. sinicus*, holotype, aedeagus, dorsal view; 145) id., lateral view; 146) *L. tonkinensis*, holotype, aedeagus, ventral view; 147) id., lateral view; 148) *L. sibiraevis*, Kirgizstan, Alaj Mts, aedeagus, dorsal view; 149) id., lateral view; 150) *L. problematicus*, holotype, aedeagus, dorsal view; 151) id., lateral view; 152) id., ventral view; 153) *L. mistus*, holotype, aedeagus, dorsal view; 154) id., lateral view; 155) id., ventral view.



Figs. 156 - 164: 156) *Laccobius quaezitus*, holotype, aedeagus, dorsal view; 157) id., lateral view; 158) id., ventral view; 159) *L. fragilis*, paratype, Japan, Hyogo Ken, aedeagus, dorsal view; 160) id., lateral view; 161) *L. stiblaevus*, base of elytral rows I - V (after SHATROVSKIY 1984, redrawn); 162) *L. fragilis*, base of elytral rows I - V (id.); 163) *L. decoratus*, Finland, Hangö, aedeagus, dorsal view; 164) id., lateral view.

- CHIESA, A. 1966: Beiträge zur Kenntnis der Hydrophiliden Afghanistans nebst Beschreibung drei neuer Arten. - Ann. Hist. Nat. Mus. Sc. Nat. Hung. 58: 299-303.
- ERICHSON, W.F. 1837: Die Käfer der Mark Brandenburg. Vol. I. - Berlin: F.H. Morin, VIII + 384 pp.
- FABRICIUS, J.C. 1775: Systema Entomologiae, sistens Insectorum classes, ordines, genera, etc. - Flensburgi et Lipsiae: Libr. Kortii, XXXII + 832 pp.
- FABRICIUS, J.C. 1801: Systema Eleutheratorum secundum ordines, genera, species; adjectis synonymis, locis, observationibus, descriptionibus. - Kiliae: Bibliopol. Acad., Vol. 1: XXIV + 506, Vol. 2, 687 pp.
- FERNANDO, C.H. 1958: The colonization of small freshwater habitats by aquatic Insects, I. - Ceylon Journ. Sci. 1 (2): 117-154.
- GANGLBAUER, L. 1904: Die Käfer von Mitteleuropa. - Wien: Karl Gerolds Sohn, 286 pp.
- GENTILI, E. 1973: Ergebnisse der zoologischen Forschungen von Dr. Z. Kaszab in der Mongolei. 326. Le specie mongoliche del genere *Laccobius*. - Fol. Ent. Hung. 26, suppl.: 57-69.
- GENTILI, E. 1974: Descrizione di nuove entità appartenenti al genere *Laccobius* Erichson, 1837 e proposta per un nuovo inquadramento sottogenerico. - Mem. Mus. Civ. St. Nat. Verona XX (1972): 549-565.
- GENTILI, E. 1975: Alcuni nuovi *Laccobius* paleartici. - Boll. Soc. Ent. Ital. 107: 127-134.
- GENTILI, E. 1979a: Aggiunte alla Revisione dei *Laccobius* paleartici. - Boll. Soc. Ent. Ital. 111: 43-50.
- GENTILI, E. 1979b: I *Laccobius* della Regione Orientale. - Ann. Oss. Fis. terr. Mus. A. Stoppani Semin. Arc. Milano (n.s.) 1 (1978): 27-50.
- GENTILI, E. 1980a: Studi sui *Laccobius*. - Ann. Oss. Fis. terr. Mus. A. Stoppani Semin. Arc. Milano (n.s.) 2 (1979): 29-35.
- GENTILI, E. 1980b: The genus *Laccobius* in Melanesia. - Pacific Ins. 22: 385-400.
- GENTILI, E. 1981: The genera *Laccobius* and *Nothydrus* in Australia and New Zealand. - Rec. S. Austr. Mus. 18 (7): 143-154.
- GENTILI, E. 1982: *Laccobius* del Vecchio Mondo: nuove specie e dati faunistici. - Ann. Oss. Fis. terr. Mus. A. Stoppani Semin. Arc. Milano (n.s.) 4 (1981): 31-38.
- GENTILI, E. 1984: Nuove specie e nuovi dati zoogeografici sul genere *Laccobius*. - Ann. Oss. Fis. terr. Mus. A. Stoppani Semin. Arc. Milano (n.s.) 5 (1982): 31-32.
- GENTILI, E. 1988: Verso una revisione del genere *Laccobius*. - Ann. Oss. Fis. terr. Mus. A. Stoppani Semin. Arc. Milano (n.s.) 9 (1986): 31-47.
- GENTILI, E. 1989: Alcune novità sul genere *Laccobius*. - Ann. Oss. Fis. terr. Mus. A. Stoppani Semin. Arc. Milano (n.s.) 10 (1987): 31-39.
- GENTILI, E. 1991: Elementi per una revisione del genere *Laccobius*. - G. It. Ent. 5: 381-389.
- GENTILI, E. & CHIESA, A. 1975: Revisione dei *Laccobius* paleartici. - Mem. Soc. Ent. It. 54: 1-187.
- GERHARDT, J. 1877: Zur Gruppe A der Rottenberg'schen *Laccobius*-Arten. - Zeitschr. Ent. Breslau n.F. 6: 8-27.
- GYLLENHAL, L. 1827: Insecta Suecica descripta. Classis I. Coleoptera sive Eleutherata. Pars 4. - Lipsiae: Fleischer, 760 pp.
- HANSEN, M. 1991: The Hydrophiloid Beetles. - Biologiske Skrifter: 1-367.
- HEBAUER, F. 1991: Die Hydrophiliden-Ausbeuten H. Mücke's und D.W. Wrase's aus Tadschikistan. - Ent. Nachr. u. Ber. 35: 175-179.
- HUGHES, G.M. 1958: The Coordination of Insect Movements III. Swimming in *Dytiscus*, *Hydrophilus*, and a Dragonfly Nymph. - Journ. Exp. Biol. 35 (3): 567-583.
- JACOBSON, G.G. 1911: Zhuki Rossii i zapadnoy Evropy. - St. Petersburg: A.F. Devrien, pp. 657-864, 83 pl.
- KAMIYA, K. 1935: Insects of Jehol [VI] - Order Coleoptera (I). - Report of the first Scientific Expedition to Manchoukuo (5) I, part 10 (45): 11 pp., 1 pl.
- KNISCH, A. 1910: Über einige von Dr. Erich Zugmayer in Tibet und Turkestan gesammelte Hydrophiliden. - Zool. Jahrb. Jena 29: 451-454.



- KNISCH, A. 1924a: Pars 79. Hydrophilidae. - In S. SCHENKLING (ed.): *Coleopterorum Catalogus*, Berlin: W. Junk, 306 pp.
- KNISCH, A. 1924b: Neue Palpicornier aus dem südlichen Himalaya. - *Wien. Ent. Zeit.* 41 (1-3): 29-41.
- KNISCH, A. 1927: Neue Hydrophiliden der Orientalfauna. - *Spolia Zeylan.* XIV: 129-133.
- KUWERT, A. 1890: Bestimmungs-Tabellen der europäischen Coleopteren XIX. Hydrophilidae, I, Hydrophilini. - *Verh. Nat. Ver. Brünn* 28: 1-121.
- LEE, S.H., CHO, Y.B. & LEE, C.E. 1988: A taxonomy of the subfamily Hydrobiinae of South Korea. - *Nat. Life (Korea)* 18 (2): 71-78.
- LINNAEUS, C. 1758. *Systema naturae, sive regna tria naturae systematice proposita per classes, ordines, genera et species.* (10th edition). - Holmiae: Laur. Salvii, Vol. 1, II + 824 pp.
- MATSUI, E. 1986: Notes on some new Hydrophiloidea from Japan (Coleoptera). - *Papers on Entomology presented to Prof. Takehiko Nakane in commemoration of his retirement*, Tokyo: 81-90.
- MOTSCHULSKY, V. 1860: Coléoptères de la Sibirie orientale et en particulier des rives de l'Amour (rapportés par Schrenck, Maak, Ditmar, Voznessenski). - In L. von Schrenck (ed): *Reisen und Forschungen im Amur-Lande*. Vol. 2 (2): 79-257, 6 pl., 1 map.
- NAKANE, T. 1966: New or little-known Coleoptera from Japan and its adjacent regions, XXIII. Hydrophiloidea. - *Fragmenta Coleopterologica* 14: 55-58.
- NEWBERY, E.A. 1908: On a new species of *Laccobius* Er., with a table of the British species of the genus. - *Ent. Month. Mag.* 44: 30-31.
- d'ORCHYMONT, A. 1923: Hydrophilidae of India. - *Mem. Dep. Agric. India* 7: 1-12.
- d'ORCHYMONT, A. 1925: Contribution à l'étude des Hydrophilides I. - *Bull. Ann. Soc. Ent. Belg.* 65: 63-77.
- d'ORCHYMONT, A. 1926: Contribution à l'étude des Hydrophilides V. - *Bull. Ann. Soc. Ent. Belg.* 66: 91-106.
- d'ORCHYMONT, A. 1928: Catalogue of Indian Insects. Part 14. Palpicornia. - *Calcutta: Government of India, Central Publication Branch*, II + 146 pp.
- d'ORCHYMONT, A. 1930: Notes synonymiques sur le genre *Laccobius* - *Er. Bull. Ann. Soc. Ent. Belg.* 70: 33-40.
- d'ORCHYMONT, A. 1932: Palpicornes recueillis en Turquie d'Asie par M. Henri Gadeau de Kerville. - *Société Entomologique de France, Livre du Centenaire*: 393-401.
- d'ORCHYMONT, A. 1935a: Aquatic Insects of China. Article XVII. A new species of water scavenger beetle from China. - *Peking Nat. Hist. Bull.* 9, 2: 109-110.
- d'ORCHYMONT, A. 1935b: Aquatic Insects of China. Article XX. Catalogue of Chinese Palpicornia. - *Peking Nat. Hist. Bull.* 9, 3: 185-225.
- d'ORCHYMONT, A. 1936: Notes sur quelques espèces du genre *Laccobius* Erichson, II. - *Bull. Ann. Soc. Ent. Belg.* 76: 425-438.
- d'ORCHYMONT, A. 1937a: Contribution à l'étude des Palpicornia IX. - *Bull. Ann. Soc. Ent. Belg.* 77: 213-255.
- d'ORCHYMONT, A. 1937b: Coleoptera Palpicornia from the Khewra Gorge, Salt Range, Punjab. - *Rec. Ind. Mus.* 39: 33-41.
- d'ORCHYMONT, A. 1943a: Les Palpicornia du Tibet. - *Bull. Mus. R. Hist. Nat. Belg.* 19, 57: 1-16.
- d'ORCHYMONT, A. 1943b: Palpicornia (Coleoptera), VI. - *Bull. Mus. R. Hist. Nat. Belg.* 19, 60: 1-12.
- PERKINS, P.D. 1976: Psammophilous aquatic beetles in Southern California: A study of microhabitat preferences with notes on response to stream alteration. - *Coleopt. Bull.* 30 (4): 309-324.
- PU, C.-L. [Zhelong] 1957: Key to the genera and subgenera of Chinese Hydrophilidae. - *Zhongshan University Journal*: 61-68 (in Chinese).
- PU, C.-L. [Zhelong] 1981: Coleoptera, Hydrophilidae. - *Insects [Xizang I.]*: 337-338.
- RÉGIMBART, M. 1903a: Voyage de M. Maurice Maindron dans l'Inde Méridionale. I. Dytiscides, Gyrinides et Palpicornes. - *Ann. Soc. Ent. France* 72: 331-339.

- RÉGIMBART, M. 1903b: Contribution à la faune indo-chinoise. Hydrophilidae. - Ann. Soc. Ent. France 72: 52-64.
- ROTTENBERG, A. 1874: Revision der Europäischen *Laccobius*-Arten. - Berl. Ent. Zeitschr. 18: 305-324.
- SAHLBERG, J. 1900: Coleoptera mediterranea et rosso-asiatica nova vel minus cognita itineribus annis 1895-96 et 1898-99 collecta, I. - Ofv. Finsk. Vet. Soc. Forh. 42: 174-208.
- SATÔ, M. 1966: Some species of aquatic Coleoptera from New Caledonia. - Bull. Osaka Mus. nat. Hist. 19: 1-8, 1 pl.
- SHARP, D. 1884: The water-beetles of Japan. - Trans. Ent. Soc. London: 439-464.
- SHATROVSKIY, A.G. 1984: Obzor vodolyubov roda *Laccobius* Er. (Coleoptera, Hydrophilidae) fauny SSSR. - Ent. Obozr. 63 (2): 301-325.
- SHATROVSKIY, A.G. 1989: Hydrophilidae, pp. 264-293. - In P.A. LER (ed): Opredelitel nazekomykh dalnevo vostoka SSSR. - Leningrad: Academy of Sciences.
- STEPHENS, J.F. 1829: Illustrations of British entomology. Mandibulata. Vol. II. - London: Baldwin & Cradock, 200 pp.
- TASSEL, E.R. van 1966: Taxonomy and Biology of the subfamily Berosinae of North and Central America and the West Indies. - The Catholic University of America, unpublished Ph. D. Thesis.
- THOMSON, C.G. 1853: Oefversigt af de i Sverige funna arter af familien Palpicornia. - Oefvers. Vet. Acad. Förh. 10: 40-58.
- THOMSON, C.G. 1868: Skandinaviens Coleoptera, synoptiskt bearbetade. 10. Lund: Tryckt, 420 pp.
- WOLLASTON, T.V. 1867: Coleoptera Hesperidum. - London: J. van Voorst, XXXIX + 285 pp.
- YANG, C. 1994: Coleoptera 17, pp. 330-391. - In C. Morse, L. Yang, and L. Tian (eds): Aquatic insects of China useful for monitoring water quality. - Nanjing: Hohai University Press.
- ZAITZEV, Ph.A. 1908a: Beitrag zur Kenntnis der Wasserkäfer von Chinesisch Centralasien. - Ezheg. zool. Mus. Imp. Akad. Nauk 13: 417-426.
- ZAITZEV, Ph.A. 1908b: Catalogue des Coléoptères aquatiques des familles Dryopidae, Georyssidae, Cyathoceridae, Heteroceridae et Hydrophilidae. - Trudy russk. ent. Obshch. 38: 283-420.
- ZAITZEV, Ph.A. 1938: Vidy r. *Laccobius* Er. v faune SSSR i sopredel'nykh stran (Coleoptera, Hydrophilidae). - Trudy Zool. Sek. Baku 2: 109-124.
- ZAITZEV, Ph.A. 1953: Aquatic beetles in the Gruzian fauna. - Tr. Inst. Zool. Akad. Nauk SSSR 11: 87-126.

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