

Taxonomic revision of *Agraphydrus* RÉGIMBART, 1903

II. The Indian Subcontinent

(Coleoptera: Hydrophilidae: Acidocerinae)

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Abstract

The species of *Agraphydrus* RÉGIMBART, 1903 from Bhutan, India, Nepal, Pakistan, and Sri Lanka are revised. *Agraphydrus exedis* (ORCHYMONT, 1937), *A. indicus* (ORCHYMONT, 1932), *A. kempfi* (ORCHYMONT, 1922), *A. montanus* MINOSHIMA et al., 2015, *A. pauculus* (KNISCH, 1924), *A. pygmaeus* (KNISCH, 1924), *A. stagnalis* (ORCHYMONT, 1937), and *A. uvaensis* (HEBAUER, 2000) are re-described. Thirty-six new species are described: *Agraphydrus anatinus*, *A. andamanicus*, *A. angustipennis*, *A. annapurnensis*, *A. ater*, *A. bhutanensis*, *A. boukali*, *A. ceylonensis*, *A. cinnamum*, *A. communis*, *A. constrictus*, *A. crassipennis*, *A. falcatus*, *A. flavonotus*, *A. fortis*, *A. gilvus*, *A. glaber*, *A. heinrichi*, *A. hygropetricus*, *A. inflatus*, *A. kallar*, *A. khasiensis*, *A. kodaguensis*, *A. meghalayanus*, *A. nanus*, *A. nepalensis*, *A. obscuratus*, *A. obsoletus*, *A. protentus*, *A. pullus*, *A. punctulatus*, *A. rostratus*, *A. rugosus*, *A. sipekorum*, *A. taprobanensis*, and *A. tumulosus*. Lectotypes are designated for *A. pauculus* and *A. pygmaeus*. Specimens from Afghanistan, recorded under the name “*Agraphilydrus pauculus* KNISCH” by CHIESA (1967) were also examined; they belong to *Agraphydrus*, but they could not be identified to species level. The genus *Agraphydrus* is recorded from Bhutan for the first time; *A. coomani* (ORCHYMONT, 1927) is recorded from the Indian Subcontinent (Sri Lanka) for the first time; other new records: *A. connexus* KOMAREK & HEBAUER, 2018 from Bhutan and India; *A. indicus* from Bhutan and Nepal; and *A. kempfi*, *A. pygmaeus*, *A. stagnalis* from Bhutan. A total of 46 species is now known from the Indian Subcontinent. *Agraphydrus coomani* and *A. connexus* are widespread in the Oriental Region, the former also in the Australian Region; all other species are restricted to the Indian Subcontinent. Six of the seven species known from Sri Lanka are endemic to this island. The habitat of four species is unknown, all other species are aquatic, nine were found in hygropetric habitats. Habitus, male genitalia and other morphological details are illustrated, distribution maps are presented, and a key to the species is added.

Key words: Coleoptera, Hydrophilidae, *Agraphydrus*, taxonomy, revision, key to species, new species, Oriental Region, Afghanistan, Bhutan, India, Nepal, Pakistan, Sri Lanka.

Introduction

The Indian Subcontinent is part of the old Gondwana Continent and covers an area of almost 4.5 million km², comprising Pakistan, India, Nepal, Bhutan, Sri Lanka, and Bangladesh.

The first specimens of *Agraphydrus* RÉGIMBART, 1903 were collected between 1912 and 1932 in Pakistan and India, mostly by Harry G. Champion (1891–1979), then forest officer in British India. Based on these specimens six species of *Agraphydrus*, originally assigned to *Helochares* MULSANT, 1844, were described: *A. kempfi* (ORCHYMONT, 1922), *A. pauculus* (KNISCH, 1924), *A. pygmaeus* (KNISCH, 1924), *A. indicus* (ORCHYMONT, 1932), *A. exedis* (ORCHYMONT, 1937), and *A. stagnalis* (ORCHYMONT, 1937).

Since 1961 an increasing number of sampling activities was carried out in South Asia, starting with the expedition by E.S. Ross & D.Q. Cavagnaro in 1961 to Nepal, and the Lund University Ceylon Expedition in 1962 to Sri Lanka. Since the 1980s many water beetle collecting trips, yielding also *Agraphydrus* species, were carried out, notably by M.A. Jäch (17 spp.), D. Boukal (13 spp.), O. Jäger (10 spp.), J. Schmidt (7 spp.), W. Schawaller (6 spp.), I. Löbl & A. Smetana (4 spp.), M. Fikáček, H. Podskalská & P. Šípek (4 spp.), A. Skale (4 spp.), A. Weigel (4 spp.), E. Jendek & O. Šauša (3 spp.), R. Schuh (3 spp.), and G. Wewalka (2 spp.).

Despite the large number of species collected since the 1960s only two new species were described from the Indian Subcontinent in the last 80 years: *Agraphydrus uvaensis* (HEBAUER, 2000) (described from a single female, originally assigned to *Megagrphydrus* HANSEN, 1999), and *A. montanus* MINOSHIMA, KOMAREK & ÔHARA, 2015. A third one, *A. connexus* KOMAREK & HEBAUER, 2018, which is widely distributed in the Oriental Region (incl. Bhutan, India, Nepal), was described very recently in a revision of the Chinese species (KOMAREK & HEBAUER 2018). HEBAUER (2000a) studied the hydrophilids of Sri Lanka and named eight new species of *Agraphydrus* “in press”, but they were never described, because most of these “new species” were based on females or on already described species (*Agraphydrus coomani* (ORCHYMONT, 1927)).

Thirty-six new species of *Agraphydrus* are described below. In addition, *Agraphydrus coomani* is here recorded from the Indian Subcontinent (Sri Lanka) for the first time.

Abbreviations

C.I.	clypeal index = ratio greatest width / median length of clypeus anterior to eyes
E.I.	elytral index = ratio greatest elytral length / greatest elytral width
P.I.	pronotal index = ratio greatest pronotal width / median pronotal length
CAS	California Academy of Sciences, San Francisco, USA (D. Kavanaugh, N.D. Penny, C. Grinter)
CSH	Coll. Andre Skale, Hof, Germany
EUM	Ehime University, Matsuyama, Japan (H. Yoshitomi)
HNHM	Hungarian Natural History Museum, Budapest, Hungary (G. Makranczy)
IMK	Indian Museum, Kolkata, India
ISNB	Institut des Sciences naturelles de Belgique, Bruxelles, Belgium (P. Limbourg, Y. Gérard)
MHNG	Muséum d'histoire naturelle, Genève, Switzerland (G. Cuccodoro)
MNS	Museum für Naturkunde, Stuttgart, Germany (C. König, W. Schawaller)
MTD	Senckenberg Naturhistorische Sammlungen Dresden (Museum für Tierkunde), Germany (O. Jäger)
NHM	Natural History Museum, London, UK (C. Taylor)
NME	Naturkundemuseum Erfurt, Germany (A. Weigel, A. Skale)
NMP	National Museum Prag, Czechia (M. Fikáček)
NMW	Naturhistorisches Museum Wien, Austria (M.A. Jäch)
SEMC	Biodiversity Institute, University of Kansas, Lawrence, USA (A.E.Z. Short)
ZML	Zoological Museum, Lund University, Sweden (C. Fägerström)
ZMUC	Zoological Museum, University of Copenhagen, Denmark (A. Solodovnikov, S.G. Selvantharan)

Material and methods

About 2000 specimens of *Agraphydrus*, collected in about 250 localities on the Indian Subcontinent (incl. Afghanistan and the Andaman Islands) were examined.

Male genitalia were dissected, placed in concentrated lactic acid and studied up to 24 hours later. The specimens were examined using a stereo microscope (Leica MZ 12.5) with diffuse and focused light sources, and a compound microscope (Olympus BX 41). Measurements were taken using a micrometric eyepiece and the analyzing modul of Leica LAS 4.10.0. Drawings were made using CorelDRAW X8. Photographs were taken with a Leica MC 170 HD in combination with LAS 4.10.0 and processed with Adobe Photoshop. Tables were prepared with CorelDRAW X8 and Adobe Photoshop.

Curly brackets “{ }” are used for remarks by the author. Within the precisely cited label data, a backslash “\” indicates the change of line, a straight line “|” the change of label. Additional notes on geographical and/or ecological details are based on personal information provided by the col-

lectors. Morphological terms used in this contribution are explained in KOMAREK & HEBAUER (2018). Additional data about the collecting sites of the Lund University Ceylon Expedition in 1962 were taken from BRINCK et al. (1971).

Checklist of the *Agraphydrus* species of the Indian Subcontinent

1. *A. anatinus* sp.n.
INDIA (Goa, Kerala, Maharashtra)
2. *A. andamanicus* sp.n.
INDIA (North Andaman Isl.)
3. *A. angustipenis* sp.n.
SRI LANKA
4. *A. annapurnensis* sp.n.
NEPAL
5. *A. ater* sp.n.
NEPAL
6. *A. bhutanensis* sp.n.
BHUTAN
7. *A. boukali* sp.n.
INDIA (Karnataka, Kerala, Tamil Nadu)
8. *A. ceylonensis* sp.n.
SRI LANKA
9. *A. cinnamum* sp.n.
INDIA (Kerala)
10. *A. communis* sp.n.
BHUTAN, INDIA (Uttarakhand), NEPAL
11. *A. connexus* KOMAREK & HEBAUER, 2018
BHUTAN, INDIA (Madhya Pradesh), NEPAL, CHINA (Hainan), LAOS, MALAYSIA, MYANMAR, THAILAND, VIETNAM
12. *A. constrictus* sp.n.
INDIA (Assam, Uttarakhand), NEPAL
13. *A. coomani* (ORCHYMONT, 1927)
SRI LANKA, CHINA, TAIWAN, SE ASIA to AUSTRALIA
14. *A. crassipenis* sp.n.
BHUTAN, NEPAL
15. *A. exedis* (ORCHYMONT, 1937)
INDIA (Madhya Pradesh, Maharashtra)
16. *A. falcatus* sp.n.
INDIA (Kerala, Tamil Nadu)
17. *A. flavonotus* sp.n.
BHUTAN
18. *A. fortis* sp.n.
SRI LANKA

19. *A. gilvus* sp.n.
INDIA (Kerala)
20. *A. glaber* sp.n.
INDIA (Madhya Pradesh)
21. *A. heinrichi* sp.n.
INDIA (Kerala)
22. *A. hygropetricus* sp.n.
SRI LANKA
23. *A. indicus* (ORCHYMONT, 1932)
BHUTAN, INDIA (Arunachal Pradesh, Himachal Pradesh, Meghalaya, Uttarakhand), NEPAL
24. *A. inflatus* sp.n.
INDIA (Kerala, Tamil Nadu)
25. *A. kallar* sp.n.
INDIA (Kerala)
26. *A. kempi* (ORCHYMONT, 1922)
BHUTAN, INDIA (Arunachal Pradesh, Meghalaya, Uttarakhand), NEPAL
27. *A. khasiensis* sp.n.
INDIA (Meghalaya)
28. *A. kodaguensis* sp.n.
INDIA (Karnataka)
29. *A. meghalayanus* sp.n.
INDIA (Meghalaya)
30. *A. montanus* MINOSHIMA, KOMAREK & ÔHARA, 2015
INDIA (Sikkim)
31. *A. nanus* sp.n.
INDIA (Karnataka, Kerala, Madhya Pradesh)
32. *A. nepalensis* sp.n.
NEPAL
33. *A. obscuratus* sp.n.
INDIA (Karnataka, Kerala, Maharashtra)
34. *A. obsoletus* sp.n.
INDIA (Karnataka, Kerala, Tamil Nadu)
35. *A. pauculus* (KNISCH, 1924)
[CHINA (Tibet) – see p. 152, last paragraph], INDIA (Uttarakhand), NEPAL
36. *A. protentus* sp.n.
INDIA (Uttarakhand), NEPAL
37. *A. pullus* sp.n.
NEPAL
38. *A. punctulatus* sp.n.
INDIA (Madhya Pradesh)

39. *A. pygmaeus* (KNISCH, 1924)

BHUTAN, [CHINA (Tibet) – see p. 152, last paragraph], INDIA (Uttarakhand, Meghalaya), NEPAL

40. *A. rostratus* sp.n.

INDIA (Kerala, Tamil Nadu)

41. *A. rugosus* sp.n.

INDIA (Kerala, Tamil Nadu)

42. *A. sipekorum* sp.n.

INDIA (Meghalaya)

43. *A. stagnalis* (ORCHYMONT, 1937)

BHUTAN, INDIA (Himachal Pradesh, Uttarakhand), NEPAL, PAKISTAN (Punjab)

44. *A. taprobanensis* sp.n.

SRI LANKA

45. *A. tumulosus* sp.n.

INDIA (Kerala)

46. *A. uvaensis* (HEBAUER, 2000)

SRI LANKA

***Agraphydrus anatinus* sp.n.**

TYPE LOCALITY: India, Goa, South Goa District, Salcete (= Salcette or Saxti) Subdivision.

TYPE MATERIAL: **Holotype** ♂ (NMW): “India, Goa \ Salcete \ 13.–16. 4. {19}99 \ E. Heiss”. **Paratypes**: **INDIA**: **Goa**: 1 ♂, 3 ♀♀ (NMW): same sampling data; 29 exs. (SEMC): Sanguem Distr., 15°22'43"N 74°13'52"E, ca. 340 ft., near Bhagwan Mahaveer Sanctuary, 100 m E Molem, HG-vapor light, 24.–25.IX.2005, leg. C.R. Bartlett; **Kerala**: 1 ♂, 3 ♀♀ (NMW): Pathanamthitta Distr., 5 km S Ranni, 9°21'N 76°47'E, 1.I.1994, leg. D. Boukal & Z. Kejval “14”; 3 ♀♀ (NMW): Pathanamthitta Distr., 10 km N Pathanamthitta, Perunad (village), 9°21'N 76°50'E, 70 m a.s.l., 28.XII.1998, leg. D. Boukal “23”; 1 ♂, 4 ♀♀ (NMW): same sampling data, but “24”; 1 ♀ (NMW): Thiruvananthapuram Distr., Cardamom Hills, 50 km NW Pathanamthitta, large stream near Pambaiyar River, 9°25'N 77°05'E, 300 m a.s.l., 27.–29.XII.1993, leg. Z. Kejval & D. Boukal “12”; 1 ♂, 2 ♀♀ (NMW): Thiruvananthapuram Distr., ca. 30 km NNE Thiruvananthapuram, Kallar, ca. 8°43'N 77°07'E, ca. 200 m a.s.l., muddy clay pond, unshaded, eutrophic, warm, with semiaquatic plants, 3.I.1999, leg. D. Boukal “43”; **Maharashtra**: 32 exs. (SEMC): Ratnagiri Distr., SE Rajapur, 16°34.992'N 73°35.221'E, pond, 1.X.2004, leg. K.B. Miller.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with apical infuscation on maxillary palpomere 4, metafemoral pubescence on at least proximal half, and absence of clypeal microsculpture, together with *A. ater*, *A. cinnamum*, *A. constrictus*, *A. coomani*, *A. heinrichi*, and *A. taprobanicus*. Shares presence of low carina on mesoventrite, and pubescence on proximal half of metafemur with *A. taprobanicus*, but differs in nine-segmented antennae, absence of emargination on ventrite 5, and features of aedeagus (phallobase slightly shorter than parameres, median lobe bottle-shaped, semilunar structure absent).

DESCRIPTION: Total length: 1.7–2.1 mm; elytral width: 0.8–1.0 mm; E.I.: 1.2–1.4, P.I.: 2.0–2.1, elytra 2.8–3.0 times as long as pronotum. Habitus (Fig. 1) slightly elongate, widest at midlength, moderately convex.

Coloration: Labrum, clypeus and frons black, preocular patches distinct, as large as eyes; maxillary palpi yellow, palpomere 4 infuscated in apical third to apical half; pronotum yellow, slightly darker mesally; elytra yellow; ventrites dark brown to black, legs lighter colored.

Head: Clypeus with weakly concave anterior margin, C.I.: 4.1, lateral length ratio clypeus/eyes = 1.4; microsculpture absent, ground punctures fine, interspaces 2–3 times as wide as punctures,

systematic punctures distinct. Eyes large, but not protruding, oval. Antennae with nine antennomeres. Maxillary palpi (Fig. 91) slender, 1.1 times as long as pronotum in midline, as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.1–1.2, palpomere 4 slightly asymmetrical. Mentum with very fine punctures, without microsculpture.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral ground punctation as on head and pronotum, four rows of systematic punctures moderately distinct, mesal rows 1–3 strongly reduced in number, not reaching anterior margin, additional loose row present along lateral margin. Mesoventrite with narrow low median carina.

Femora (Fig. 45): Pubescence present on proximal half of femora, hairlines straight on pro- and mesofemur, weakly sigmoid on metafemur.

Abdomen: Ventrite 5 without apical emargination.

Aedeagus (Fig. 105): Length: 0.28–0.29 mm. Phallobase slightly shorter than parameres, slightly wider than long; manubrium very indistinct, undefined; border between pigmented and unpigmented portion of ventral face indistinct, reaching base of phallobase. Parameres very wide at base, strongly constricted subapically with a hook (directed laterad), formed by reinforcing structure of dorsal face, apical region resembling shape of a duck-head; dorsal face slightly reaching into phallobase, ventral face shorter and wider than dorsal face. Median lobe with distinctly distinguishable ventral and dorsal face; dorsal face bottle-shaped, reaching apex of parameres, ventral face with almost parallel-sided lateral margins, slightly shorter and wider than dorsal face, corona situated subapically; basal apophyses long, widely separated, extending to midlength of phallobase.

ECOLOGY: The specimens were collected in streams, ponds and at light, between 70 and 300 m a.s.l., in Kerala (Thiruvananthapuram Distr.) together with *A. kallar*, *A. obscuratus*, and *A. obsoletus*, or together with *A. boukali*.

DISTRIBUTION (Fig. 151): India (Goa, Kerala, Maharashtra).

ETYMOLOGY: The name *anatinus* (Latin adjective derived from *anas* = duck) refers to the shape of the apex of the parameres recalling the head of a duck.

Agraphydrus andamanicus sp.n.

TYPE LOCALITY: India, North Andaman Island, Diglipur.

TYPE MATERIAL: **Holotype** ♂ (NMW): “N-ANDAMAN [North Andaman Island] 13.12.76 \ Kalimpong Riv. {= ? Kalpong River} \ 2g \ leg. Starmühlner”. **Paratypes**: 3 ♀♀ (NMW): same sampling data; 1 ♂ (NMW): same sampling data, but “2c”; 2 ♂♂, 5 ♀♀ (NMW): same sampling data, but “2d”.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with shagreenation on anterior margin of clypeus; differs from all species with shagreened clypeus in habitus (elytra widening posteriorly), very long maxillary palpomeres (1.5 times as long as pronotal median length), presence of apical infuscation on palpomere 4, and in the aedeagus (median lobe very narrow with knob-shaped apex). Shares presence of clypeal microsculpture and apical infuscation of palpomere 4 also with *A. umbrinus* KOMAREK & HEBAUER, 2018, *A. agilis* KOMAREK & HEBAUER, 2018, and *A. variabilis* KOMAREK & HEBAUER, 2018; differs from these species in reduced shagreenation of clypeus and in the aedeagus (pencil-shaped median lobe).

DESCRIPTION: Total length: 2.2–2.5 mm; elytral width: 1.0–1.1 mm; E.I.: 1.4, P.I.: 2.0, elytra 3.1 times as long as pronotum. Habitus (Fig. 2) slender, elytra slightly widening posterior of midlength, weakly convex.

Coloration: Labrum, clypeus and frons black, clypeus with very narrow undefined yellowish lateral margins; maxillary palpi yellow, palpomere 4 with weakly infuscated apex; pronotum and elytra dark brown to black; elytra with undefined brown area on posterior portion of disk; ventrites and femora light to dark brown.

Head: Clypeus with concave to slightly angularly excised anterior margin, C.I.: 3.6, lateral length ratio clypeus/eyes = 1.5; microreticulation present along lateral margins and narrowly on anterior margin with small unsculptured anteromedial area, ground punctures very fine, interspaces 2–5 times as wide as punctures, systematic punctures distinct. Eyes large, but not protruding, slightly oblong. Antennae with nine antennomeres. Maxillary palpi (Fig. 92) slender, 1.5 times as long as pronotum in midline, 1.2–1.3 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.2, palpomere 4 asymmetrical. Mentum with very fine, widely spaced punctures on lateral portions with weak microsculpture on lateral parts.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral ground punctation as on head and pronotum, four rows of systematic punctures distinct, mesal rows strongly reduced in number, not reaching anterior margin, few additional coarse punctures present along lateral margins. Mesoventrite with weak mesal bulge.

Femora (Fig. 46): Pubescence present on ca. proximal half of profemur, on proximal 2/3 of meso- and metafemur, hairlines oblique on pro- and mesofemur, straight on metafemur.

Abdomen: Ventrite 5 weakly sclerotized apically; emargination absent, or with very flat emargination, ca. 5 µm deep.

Aedeagus (Fig. 106): Length: 0.40 mm. Phallobase as long as parameres, converging almost rectangularly to distinct, narrow manubrium; border between pigmented and unpigmented portion of ventral face indistinct. Parameres with almost straight, parallel-sided margins, apex bluntly rounded, not inflated. Median lobe very narrow, bottle-shaped with very narrow, spindle-like “bottle-neck”, exceeding length of parameres, apex knob-shaped, corona small, proximal of midlength; basal apophyses short, narrowly separated, weakly extending into phallobase.

ECOLOGY: The specimens were found in a river.

DISTRIBUTION (Fig. 151): India (North Andaman Island).

ETYMOLOGY: The name refers to the Andaman Islands, where this species has been collected.

Agraphydrus angustipenis sp.n.

TYPE LOCALITY: Sri Lanka, “Dambuwa Estate”. The type locality of *Agraphydrus angustipenis* is not entirely clear since there are several Dambuwa Estates in Sri Lanka, especially in the Western and North Western provinces. The type locality may, however, be identical with the Dambuwa Estate (Western Province, Gampaha Distr., Yakkala) visited by the Lund University Ceylon Expedition in 1962.

TYPE MATERIAL: **Holotype** ♂ (CAS): “CEYLON, Dambuwa \ Est., 15–V–1965, \ K.L.A. Perera coll., \ CAL. ACAD. SCI. ACCESS.”.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with strongly reduced metafemoral pubescence and unicolorous maxillary palpomeres, together with *A. boukali*, *A. ceylonensis*, *A. longipalpus* (JIA, 1998), *A. calvus* KOMAREK & HEBAUER, 2018, and some specimens of *A. indicus*. Shares presence of mesoventral carina with *A. ceylonensis*; nine-segmented antennae with *A. ceylonensis* and *A. longipalpus*; maxillary palpi shorter than pronotum with *A. calvus*, *A. ceylonensis*, and *A. longipalpus*; absence of emargination on ventrite 5 with *A. calvus*, *A. ceylonensis*, and *A. indicus*; large size (body length more than 2.1 mm) with *A. longipalpus*. Differs from all species in the aedeagus (median lobe very narrow, parameres very wide).

DESCRIPTION: Total length: 2.4 mm; elytral width: 1.1 mm; E.I.: 1.2, P.I.: 2.1, elytra 2.6 times as long as pronotum. Habitus (Fig. 3): broad, evenly oval, moderately convex.

Coloration: Labrum, clypeus, and frons black, clypeus with very indistinct yellowish lateral margins, preocular patches absent; maxillary palpi unicolored yellow; pronotum black; elytra black with undefined light brown lateral margins and lighter colored posterior portion; ventrites dark brown, legs lighter brown.

Head: Clypeus with weakly concave anterior margin, C.I.: 4.2, lateral length ratio clypeus/eyes = 1.2; microsculpture absent, ground punctures fine, interspaces two times as wide as punctures, systematic punctures moderately distinct. Eyes large, but not protruding, slightly oval. Antennae with nine antennomeres. Maxillary palpi (Fig. 93): moderately stout, 0.9 times as long as pronotum in midline, 0.9 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 0.9, palpomere 4 symmetrical with biconvex margins. Mentum with very fine punctures, without microsculpture.

Thorax: Pronotal ground punctation as on head, systematic punctures moderately distinct. Elytral ground punctation stronger than on head and pronotum, four rows of systematic punctures very indistinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with very low short median carina.

Femora (Fig. 47): Pubescence present on slightly more than proximal half of profemur, on proximal 2/3 of mesofemur, on metafemur restricted to a narrow rim on proximal half of anterior margin and adjacent to trochanter; hairlines straight on pro- and mesofemur.

Abdomen: Ventrite 5 without apical emargination.

Aedeagus (Fig. 107): Length: 0.54 mm. Phallobase about as long as parameres, about as long as wide, abruptly bending to wide manubrium; border between pigmented and unpigmented portion of ventral face indistinct, dorsal lobes large, almost meeting in midline. Parameres wide at base, converging apicad, margins weakly rounded; apex very narrowly rounded, not inclining mesad; base deeply reaching into phallobase. Median lobe narrow, apex not reaching apex of parameres, dorsal face shorter than ventral face; corona situated proximal of midlength; styli absent; apophyses large, not reaching midlength of phallobase.

DISTRIBUTION (Fig. 156): Sri Lanka.

ECOLOGY: Details of the collecting circumstances of the holotype are unknown. The specimen was collected together with *A. taprobanensis*.

ETYMOLOGY: The name *angustus* (Lat.) (= narrow) refers to the shape of the median lobe.

Agraphydrus annapurnensis sp.n.

TYPE LOCALITY: Nepal, Western Region, Gandaki Zone, Kaski District, Annapurna Mountains, ca. 10 km ENE Pokhara, tributary of Madi Khola River below Kwinkal (village), ca. 28°13'55"N 84°5'16"E.

TYPE MATERIAL: **Holotype** ♂ (MTD): "NEPAL, Annapurna-Reg. \ Madi Khola-Zufl. {tributary of Madi Khola} bei {at} Bhaise \ ca. 500 m {750 m a.s.l.}, unterh. {below} Kwinkal \ 15.V.1996, leg. O. Jäger". **Paratypes:** **NEPAL: Western Region:** 2 ♂♂, 1 ♀ (MTD, NMW): same sampling data; 1 ♂ (NMW): Gandaki Zone, Annapurna, N Pokhara, Kali Khola River below Garlang (village), 1000–1200 m a.s.l., 18.IV.1996, leg. O. Jäger; **Mid-Western Region:** 1 ♂ (MNS): Bheri Zone, Surkhet Distr., NE Surkhet, 700–1200 m a.s.l., 27.V.1998, leg. W. Schawaller "554".

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with completely shagreened clypeus, unicolored maxillary palpomeres, unicolored yellow pronotum and elytra, together with *A. flavonotus* and *A. gilvus*. Differs from *A. flavonotus* in less broad habitus, from *A. gilvus* in

nine-segmented antennae, from both species in the aedeagus (narrow apex of parameres with sharply pointed lateral projections).

DESCRIPTION: Total length: 2.1 mm; elytral width: 1.0–1.1 mm; E.I.: 1.4, P.I.: 2.0–2.1, elytra 3.1–3.2 times as long as pronotum. Habitus (Fig. 4) slender, evenly oval, weakly convex.

Coloration: Labrum, clypeus and frons black, clypeus with distinctly defined yellow, triangular preocular patches about as wide as diameter of eye; maxillary palpi yellow, infuscations absent; pronotum and elytra unicolored yellow; ventrites light brown, legs slightly lighter colored than ventrites.

Head: Clypeus with distinctly concave anterior margin, C.I.: 3.4, lateral length ratio clypeus/eyes = 2.0; almost entirely microreticulate, very small postero-mesal area unsculptured; ground punctures on clypeus obsolete, on frons very fine, weakly impressed, interspaces 2–3 times as wide as punctures, systematic punctures moderately distinct. Eyes large, not protruding, slightly oblong. Antennae with nine antennomeres. Maxillary palpi slender, 1.2–1.4 times as long as pronotum in midline, 1.1–1.2 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.4, palpomere 4 slightly asymmetrical. Mentum with moderately coarse punctures, densely grouped laterally, partly merging, indistinct wrinkles present.

Thorax: Pronotal ground punctation as on head, systematic punctures moderately distinct. Elytral ground punctation as on head and pronotum, four rows of systematic punctures moderately distinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with mesal bulge.

Femora (Fig. 48): Pubescence present on more than proximal half of profemur with oblique hairline, on proximal 2/3 of meso- and metafemur with slightly oblique hairline.

Abdomen: Ventrite 5 with almost semicircular apical emargination.

Aedeagus (Fig. 108): Length: 0.39–0.42 mm. Phallobase as long as parameres, about as long as wide, abruptly bending to the spine-like manubrium, border between pigmented and unpigmented portion of ventral face almost reaching manubrium. Parameres wide at base, strongly narrowing to apex, with tooth-like subapical extension; basal portion deeply extending into phallobase. Median lobe very narrow, pin-shaped, apex very narrowly rounded, slightly exceeding apex of parameres, corona in basal position; basal apophyses short, weakly separated, completely concealed by long extension of parameres.

ECOLOGY: The specimens were found in mountain rivers between 500 and 1200 m a.s.l.; in the Western Region of Nepal they were collected together with *A. ater*, *A. communis*, *A. kempfi*, *A. pauculus*, and *A. pygmaeus*.

DISTRIBUTION (Fig. 151): Nepal (Western Region, Mid-Western Region).

ETYMOLOGY: The name refers to the type locality, the Annapurna Mountains in the Himalaya.

Agraphydrus ater sp.n.

TYPE LOCALITY: Nepal, Western Region, Gandaki Zone, Annapurna, N Pokhara, Kali Khola, below Garlang, ca. 28°17'10"N 83°59'39"E.

TYPE MATERIAL: **Holotype** ♂ (MTD): “Nepal, Annapurna-Reg. \ nördl. {north of} Pokhara, Kali Khola \ unt. {below} Garlang, 1000–1200 m \ 18.IV.1996, leg. O. Jäger”. **Paratype:** **NEPAL: Western Region:** 1 ♀ (NMW): Nepal, Gandaki Zone, Annapurna Conservation Area, Birethanti (village at Modi Khola River), 1100 m a.s.l., 28°19'04"N 83°34'65"E, 20.IV.2000, leg. A. Skale.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with apical infuscation on maxillary palpomere 4, metafemoral pubescence on at least proximal half, and absence of

clypeal microsculpture, together with *A. anatinus*, *A. cinnamum*, *A. constrictus*, *A. coomani*, *A. heinrichi*, and *A. taprobanensis*. Differs in absence of mesoventral carina and wider extension of metafemoral pubescence from *A. anatinus* and *A. taprobanensis*; in emarginated ventrite 5 from *A. anatinus*; differs in nine-segmented antennae from *A. taprobanensis*. Differs in wider extension of metafemoral pubescence from *A. cinnamum*, *A. constrictus*, *A. coomani*, and *A. heinrichi*. Shares dark brown to black pronotum with *A. cinnamum* and some individuals of *A. heinrichi*; shares coarse ground punctures on pronotum and elytra with *A. cinnamum*. Differs in black elytra and aedeagus (parameres angulate subapically, median lobe reaching apex of parameres) from all species of the group.

DESCRIPTION: Total length: 2.0 mm (holotype) – 2.4 mm (paratype); elytral width: 0.9–1.0 mm E.I.: 1.5, P.I.: 2.0, elytra 3.2–3.4 times as long as pronotum. Habitus (Fig. 5) slender, elytra widening posterior of midlength, weakly convex.

Coloration: Labrum, clypeus, and frons black, preocular patches present, less wide than eyes; maxillary palpi yellow, palpomere 4 with distinct infuscation on distal third; pronotum and elytra black with very narrow yellow lateral margins; ventrites black; legs light brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 2.9, lateral length ratio clypeus/eyes = 1.5, microsculpture absent, ground punctures coarse, distinctly impressed, interspaces 1–3 times as wide as punctures, systematic punctures distinct. Eyes large, but not protruding, circular. Antennae with nine antennomeres. Maxillary palpi slender, 1.2 times as long as pronotum in midline, 1.3 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.2–1.3, palpomere 4 slightly asymmetrical. Mentum with fine, evenly distributed punctures, without microsculpture.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral ground punctation as on pronotum, four rows of systematic punctures indistinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with mesal bulge.

Femora (Fig. 49): Pubescence present on proximal 2/3 of profemur with slightly oblique hairline, on proximal 3/4 of meso- and metafemur with rounded hairline.

Abdomen: Ventrite 5 with shallow apical emargination.

Aedeagus (Fig. 109): Length: 0.36 mm. Phallobase about as long as parameres, slightly longer than wide, evenly narrowing proximad, without distinctly defined manubrium; border between pigmented and unpigmented portion of ventral face almost reaching manubrium. Parameres narrow, margins almost straight, lateral margin subapically angulate, apex blunt, asymmetrical, inclining mesad; dorsal face distinctly extending into phallobase. Median lobe moderately slender, widening apicad, apex narrowly rounded, reaching apex of parameres; corona situated subapically; basal apophyses moderately long, slightly diverging; styli present, not reaching apex.

ECOLOGY: The holotype was found in a calmer place near the bank of a small stream, somewhere between 1000 and 1200 m a.s.l. This species was collected together with *A. annapurnensis*, *A. communis*, *A. kempfi*, *A. pauculus*, *A. pygmaeus*, and *A. stagnalis*.

DISTRIBUTION (Fig. 151): Nepal (Western Region).

ETYMOLOGY: The name *ater* (Lat.) (= black) refers to the coloration of pronotum and elytra in contrast to the yellow color of the similar *A. coomani*.

Agropydrus bhutanensis sp.n.

TYPE LOCALITY: Bhutan, Sarpang Province, 11 km NW Sarpang, Bhur Khola, 26°55'23"N 90°23'51"E.

TYPE MATERIAL: **Holotype** ♂ (NMW): "BHUTAN: Sarpang Prov. \ 11 km NW Sarpang \ Bhur Khola, ca. 350 m \ 26°55'23"N 90°23'51"E \ 27.11.2005, leg. M. Jäch (30)"; river, ca. 30 m wide, gravel banks, furcations. **Paratypes**: **BHUTAN**: 1 ♂, 2 ♀ ♀ (NMW): Sarpang Prov., Sarpang, stream, left tributary of Sarpang Khola, 26°52'05"N 90°15'52"E, ca. 330 m a.s.l., ca. 2 m wide, flowing through cultivated land and settlements, 26.XI.2005, leg. M.A. Jäch "28"; 5 ♂ ♂, 1 ♀ (NMW): Sarpang Prov., Geylephug – Shemgang road, ca. 10 km NNE Geylephug Town, 26°56'43"N 90°31'29"E, ca. 400 m a.s.l., stream, ca. 3 m wide, with several furcations, steep, flowing from forest, 26.XI.2005, leg. M.A. Jäch "29".

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with completely shagreened clypeus and unicolored yellow maxillary palpomeres. Shares nine-segmented antennae, brown color of pronotum and elytra, small size, fine ground punctures and black clypeus with preocular patches with *A. connexus* and *A. obscuratus*. Differs from *A. connexus* in absence of connecting band between median lobe and parameres, from *A. obscuratus* in inflated apex of parameres and short median lobe, not reaching apex of parameres.

DESCRIPTION: Total length: 2.1–2.3 mm; elytral width: 1.0–1.1 mm; E.I.: 1.4, P.I.: 2.1, elytra 3.1 times as long as pronotum. Habitus (Fig. 6) slender, evenly oval, moderately convex.

Coloration: Labrum, clypeus and frons black, clypeus with yellow, triangular preocular patches about as wide as diameter of eye; maxillary palpi yellow, infuscations absent; pronotum blackish brown, with narrow yellow margins; elytra dark brown, with narrow lateral margins and black, undefined sublateral band, with indistinct, lighter brown area on disc present in some individuals; ventrites black; legs black, distal portions of femora light brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 3.7, lateral length ratio clypeus/eyes = 1.2; microreticulation present on entire clypeus, extending to frons in many individuals; ground punctures obsolete on clypeus, very fine on frons, interspaces two times as wide as punctures, systematic punctures moderately distinct. Eyes large, very slightly protruding, slightly oblong. Antennae with nine antennomeres, intermediate segments very weakly separated, with minute antennomere 4. Maxillary palpi (Fig. 94) slender, 1.2 times as long as pronotum in midline, as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.3, palpomere 4 almost symmetrical. Mentum with fine, widely spaced punctures, grouped laterally.

Thorax: Pronotal ground punctation as fine as on frons or slightly stronger, systematic punctures distinct. Elytral ground punctation as on pronotum, four rows of systematic punctures moderately distinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with strong mesal bulge.

Femora (Fig. 50): Pubescence present on proximal 2/3 of profemur, on proximal 3/4 of meso- and metafemur, hairline slightly oblique on pro- and mesofemur, straight on metafemur.

Abdomen: Ventrite 5 with almost semicircular apical emargination, ca. 25 µm deep.

Aedeagus (Fig. 110): Length: 0.31–0.32 mm. Phallobase as long as parameres, about as long as wide, abruptly bending obtusely angled to triangular manubrium; border between pigmented and unpigmented portion of ventral face reaching midlength of phallobase. Parameres wide, apex distinctly inflated; ventral face distinctly wider than dorsal face; basal portion distinctly extending into phallobase. Median lobe wide, weakly narrowing apicad, apex not reaching apex of parameres; corona situated slightly distal of midlength; basal apophyses short, straight, narrowly separated, distinctly extending into phallobase.

ECOLOGY: The specimens were collected in streams and rivers between 330 and 400 m a.s.l., together with *A. communis*, *A. connexus*, *A. crassipenis*, *A. flavonotus*, *A. indicus*, and *A. kempfi*.

DISTRIBUTION (Fig. 151): Bhutan.

ETYMOLOGY: The name refers to Bhutan, where the type specimens were collected.

Agraphydrus boukali sp.n.

TYPE LOCALITY: India, Kerala, Thiruvananthapuram District, Cardamom Hills, 50 km NW Pathanamthitta, near Pambaiyar River, ca. 9°25'N 77°05'E.

TYPE MATERIAL: **Holotype** ♂ (NMW): “S.Indien, Kerala \ Cardamom Hills, 300 m \ 50 km NW Pathanamthitta \ 77°05'E 09°25'N | small stream near \ Pambaiyar river \ 27.–29.12.1993 (12) \ leg. Boukal & Kejval”. **Paratypes**: **INDIA: Kerala**: 23 exs (NMW): same sampling data; 127 exs. (NMW): same locality, date and collector, but “leaves in small river”; 105 exs. (NMW): same locality, date and collector, but “hygropetr. near Pambaiyar River”; 5 exs. (NMW): same locality, date and collector, but “large stream near Pambaiyar River”; 3 exs. (NMW): Idukki Distr., Cardamom Hills, 10 km SW Kumily, Vallakadavu, 9°31'N 77°07'E, 1000 m a.s.l., in a miniature pool at the bottom of a rock, formed by a tiny stream and full of leaves, 24.XII.1993, leg. D. Boukal & Z. Kejval “10”; 2 exs. (NMW): Idukki Distr., Cardamom Hills, 15 km SW Munnar, Kallar Valley, 10°02'N 76°58'E, in various streams, 6.–18.XII.1993, leg. D. Boukal & Z. Kejval “7”; 1 ♂ (NMW): ca. 30 km NNE Thiruvananthapuram, Kallar, large stream along/at Ponmudi – Kallar road, ca. 8°43'N 77°05'E, 150–200 m a.s.l., large boulders, gravel, silt, some leaf packs, flow fast, in riffles torrential, rather shaded, draining disturbed primary forest, collected on the shore (silt and stones) near the water edge, 30.XII.1998, leg. D. Boukal (27); 1 ♂ (NMW): same locality and collector, but 31.XII.1998 “30”; 1 ♂ (NMW): same locality and collector, but 31.XII.1998 “31”; 1 ♂ (NMW): same locality and collector, but 1.I.1999 “33”; 7 exs. (NMW): ca. 30 km NNE Thiruvananthapuram, Kallar, ca. 8°43'N 77°07'E, 120–150 m a.s.l., in 2–3 hygropetric places along large, ca. 1–2 m wide stream close to the large waterfall and Golden Valley Mineral Water Project, all places fairly exposed, Hydrophilidae collected on mossy uneven surface and in cracks on rocks near the waterfall, 1.I.1999, leg. D. Boukal “34”; 13 exs. (NMW): same locality, date and collector, small water-filled cavities in rocks along large stream with decaying bamboo leaves, partly shaded “36”; 5 exs. (NMW): same locality, date and collector, leaves and other decaying plant matter along a small spring, partly very wet, shaded (bamboo), material sifted “37”; 3 exs. (NMW): 35 km NNE Thiruvananthapuram, Ponmudi, 8°46'N 77°07'E, 800 m a.s.l., 2.I.1999, leg. D. Boukal “39”; **Karnataka**: 1 ♂ (NMW): Kodagu Distr., Kakkabe env., 12°15'N 75°35'E, 900–1200 m a.s.l., larger stream, channel ca. 5 m wide, with large boulders, rocky bed with some stones and gravel in riffles, silt in pools, rather shaded, flowing through a small canyon in cultivated land, 21.XII.1998, leg. D. Boukal “12”; 9 exs. (NMW): Kodagu Distr., Kakkabe env., 12°15'N 75°35'E, 900–1200 m a.s.l., hygropetric (small stream flowing over a rock), some leaves and living plants, no algae, current rather fast, moderately shaded, draining disturbed forest, 22.XII.1998, leg. D. Boukal “14”; 34 exs. (NMW): Kodagu Distr., Kakkabe env., 12°15'N 75°35'E, 900–1200 m a.s.l., small stream, more than 0.5 m wide, a few cm deep, stones, silt in pools with stones, gravel, and pebbles in small riffles, leaf deposits, rather shaded, draining cardamom plantations, and a very small spring, ca. 2–3 m long before joining the stream, very small discharge, with gravel, silt, leaves, partly shaded, 23.XII.1998, leg. D. Boukal “17”; 1 ♂ (NMW): same locality data and collector, but 24.XII.1998, “20”; 11 exs. (NMW): same locality, but larger stream, channel ca. 5 m wide, with large boulders, rocky bed with some stones and gravel in riffles, silt in pools, rather shaded, flowing through a small canyon in cultivated land, 25.XII.1998, leg. D. Boukal “21”; **Tamil Nadu**: 1 ♂ (NMW): Nilgiris Distr., Nilgiri Hills, Kunjapanai, 11°22'N 76°56'E, 900 m a.s.l., Hydrophilidae in small side rock pool along a large stream, ca. 5–10 m wide (high water level), boulders, large stones, pebbles, gravel, some leaf packs, flow fast to moderate, partly shaded, polluted, draining disturbed forest, 17.I.1999, leg. D. Boukal “72”.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with strongly reduced metafemoral pubescence and unicolored maxillary palpomeres, together with *A. angustipenis*, *A. ceylonensis*, *A. longipalpus*, *A. calvus*, and some specimens of *A. indicus*. Differs from *A. angustipenis* in absence of mesoventral carina. Shares presence of emargination on ventrite 5 with *A. longipalpus*; eight-segmented antennae with *A. calvus* and *A. indicus*; small size (body length less than 2.2 mm) with *A. calvus*, *A. ceylonensis*, and *A. indicus*. Maxillary palpi longer than pronotum in midline in contrast to *A. calvus*, *A. ceylonensis*, and *A. longipalpus*. The aedeagus differs from all species of this group, among other characters, in the presence of styli.

DESCRIPTION: Total length: 1.7–2.0 mm; elytral width: 0.9–1.0 mm; E.I.: 1.2–1.3, P.I.: 1.9–2.2, elytra 3.0–3.1 times as long as pronotum. Habitus (Fig. 7) broad, evenly oval, moderately convex.

Coloration: Labrum, clypeus and frons black, with undefined narrow orange lateral clypeal margins; maxillary palpi unicolored yellow; pronotum dark brown to black with laterally decreasing intensity of color, undefined yellow lateral and narrow yellow anterior margins; elytra black with undefined, dark brown lateral margins and/or posterior third in some individuals; ventrites black; legs dark brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 4.7, lateral length ratio clypeus/eyes = 1.4; microsculpture absent, ground punctures very fine, widely spaced, systematic punctures distinct. Eyes large, but not protruding, circular. Antennae with eight antennomeres. Maxillary palpi (Fig. 95) stout, 1.0–1.1 times as long as pronotum in midline, 0.9 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.2–1.4, palpomere 4 almost symmetrical. Mentum with fine, very widely spaced distinct punctures, without microsculpture.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral ground punctation fine, slightly stronger than on pronotum, four rows of systematic punctures moderately distinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with distinct mesal bulge.

Femora (Fig. 51): Pubescence present on proximal half of pro- and mesofemur with straight hairline, restricted to very narrow rim at anterior margin of metafemur.

Abdomen: Ventrite 5 with semicircular apical emargination.

Aedeagus (Fig. 111): Length: 0.31–0.33 mm. Phallobase about as long as parameres, about as long as wide, abruptly bending to long, narrow manubrium, border between pigmented and unpigmented portion of ventral face indistinct. Parameres with almost straight margins, apex wide, blunt, not inclining, dorsal face reaching almost midlength of phallobase, ventral lobes indistinct, shorter than dorsal lobe. Median lobe moderately wide in basal half, narrowing at midlength to parallel-sided margins in apical half, with blunt apex, almost reaching apex of parameres, corona situated in apical third; basal apophyses slightly bending laterad, distinctly extending into phallobase; styli present, not reaching apex.

ECOLOGY: The specimens were found in streams, pools, and hygropetric habitats between 400 and 1200 m a.s.l.; in Karnataka they were collected together with *A. kodaguensis* and *A. obscuratus*; in Kerala together with *A. cinnamum*, *A. inflatus*, *A. kallar*, *A. obscuratus*, *A. obsoletus*, and *A. rostratus*.

DISTRIBUTION (Fig. 152): India (Karnataka, Kerala, Tamil Nadu).

ETYMOLOGY: The species is dedicated to David Boukal (Praha, Czechia), collector of the type specimens.

Agropydrus ceylonensis sp.n.

Helochares sp.: JÄCH 1984: 243.

TYPE LOCALITY: Sri Lanka, Sabaragamuwa Province, Kegalle District, a few km E Kitulgala.

TYPE MATERIAL: **Holotype** ♂ (NMW): “CEYLON \ 10.1. {19}81 {handwritten} \ Kitulgala-Umg \ C56 {handwritten} \ leg.M. Jäch”. The specimen has been severely damaged (disarticulated) by a previous researcher; the body parts were subsequently glued together by the author. **Paratypes**: SRI LANKA: 1 ♂ (ZML): Sabaragamuwa Prov., Ratnapura City, light trap in garden, 60 m a.s.l., 22.II.1962, Lund University Ceylon Expedition 1962, leg. P. Brinck, H. Andersson & L. Cederholm “loc. 95”; 1 ♀ (ZMUC): Southern Prov., Sinharaja Forest Reserve, 4.XII.1981, collector unknown.

The second specimen from the type locality (see JÄCH 1984: 243: “*Helochares* sp. {identified by P. Spangler}: hygropetriche Stelle bei {hygropetric site near} Kitulgala (C56, 100 m {ca. 200 m}), 2 Ex.”) could not be retrieved in the NMW.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with strongly reduced metafemoral pubescence and unicolored maxillary palpomeres, together with *A. angustipenis*, *A. boukali*, *A. longipalpus*, *A. calvus*, and some specimens of *A. indicus*. Shares nine-segmented antennae with *A. angustipenis* and *A. longipalpus*; absence of emargination on ventrite 5 with *A. angustipenis*, *A. calvus*, and *A. indicus*; presence of mesoventral carina with *A. angustipenis*; maxillary palpi shorter than pronotum with *A. angustipenis*, *A. calvus* and *A. longipalpus*. Differs from *A. angustipenis* (body length = 2.4 mm) and *A. longipalpus* (body length = 2.2–3.0 mm) in minor size. Differs from all species in the aedeagus (median lobe short, basal apophyses very wide, parameres with subapical lateral extensions).

DESCRIPTION: Total length: 2.0 mm; elytral width: 1.0–1.1 mm; E.I.: 1.2–1.3, P.I.: 2.1, elytra 2.8–2.9 times as long as pronotum. Habitus (Fig. 8) broad, evenly oval, moderately convex.

Coloration: Labrum and clypeus ferruginous, clypeus with undefined, yellow preocular patches, approximately as wide as diameter of eye; frons black; maxillary palpi unicolored yellow; pronotum ferruginous with decreasing intensity of coloration towards yellow lateral margins; elytra ferruginous with undefined yellow lateral margins; ventrites and legs ferruginous.

Head: Clypeus with weakly concave anterior margin, C.I.: 4.2, lateral length ratio clypeus/eyes = 1.2–1.3; microsculpture absent, ground punctures fine, interspaces 2–3 times as wide as punctures, systematic punctures indistinct. Eyes large, but not protruding, circular. Antennae with nine antennomeres. Maxillary palpi (Fig. 96) stout, 0.8–0.9 times as long as pronotum in midline, 0.9 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.0, palpomere 4 symmetrical with biconvex margins. Mentum with fine, evenly distributed punctures, without microsculpture.

Thorax: Pronotal punctures as on head, systematic punctures indistinct. Elytral ground punctation stronger than on head and pronotum, four rows of systematic punctures indistinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with very low short median carina, abruptly sloping.

Femora (Fig. 52): Pubescence present on slightly more than proximal half of profemur with oblique hairline, on proximal 2/3 of mesofemur with straight hairline, on metafemur restricted to narrow rim on proximal half of anterior margin and small area adjacent to trochanter.

Abdomen: Ventrite 5 without apical emargination.

Aedeagus (Fig. 112): Length: 0.40–0.48 mm. Phallobase about as long as parameres, about as long as wide or slightly longer than wide, with distinctly sigmoid margins, abruptly bending to rather wide manubrium; border between pigmented and unpigmented portion of ventral face reaching proximal third of phallobase; dorsal lobes large, almost meeting in midline. Parameres wide, lateral margins almost straight in proximal 2/3, bending mesad in apical third, with short, sharp tooth between proximal and distal portion; apex wide, bluntly rounded, not inflated; mesal margin of dorsal face distinctly excised; deeply extending into phallobase; ventral face very indistinct, wider than dorsal face. Median lobe wide, distinctly separated into dorsal and ventral face with blunt apex, not reaching apex of parameres; dorsal face wide; ventral face much shorter than dorsal face; corona narrow, in apical position; apophyses with large, shoe-shaped extensions, distinctly bending dorsad, distinctly extending into basal lobe.

ECOLOGY: The holotype was found on a hygropetric rock near the upper course of a small stream (right tributary of Kelani River), ca. 200 m a.s.l.; a paratype was collected at light, in a garden in Ratnapura (city), at about 60 m a.s.l., together with *A. taprobanensis*.

DISTRIBUTION (Fig. 156): Sri Lanka (Sabaragamuwa Province).

ETYMOLOGY: The name refers to Ceylon (= former name of Sri Lanka) where the type specimens were collected.

Agraphydrus cinnamum sp.n.

TYPE LOCALITY: India, Kerala, Thiruvananthapuram District, Cardamom Hills, 50 km NW Pathanamthitta, near Pambaiyar River, ca. 9°25'N 77°05'E.

TYPE MATERIAL: **Holotype** ♂ (NMW): “S-INDIEN, Kerala \ Cardamom Hills, 300 m \ 50 km NW Pathanamthitta \ 77°05'E 9°25'N \ Small Stream near \ Pambaiyar River \ 27.–29.12.1993 (12) \ leg. Boukal & Kejval”. **Paratypes**: **INDIA: Kerala**: 16 exs. (NMW): same sampling data; 1 ♀ (NMW): Thiruvananthapuram Distr., 30 km NNE, Kallar Bridge, 8°45'N 77°05'E, 400 m a.s.l., 31.XII.1998, leg. D. Boukal “31”.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with apical infuscation on maxillary palpomere 4, metafemoral pubescence on at least proximal half, and absence of clypeal microsculpture, together with *A. anatinus*, *A. ater*, *A. constrictus*, *A. coomani*, *A. heinrichi*, and *A. taprobanicus*. Differs in absence of mesoventral carina and wider extension of metafemoral pubescence from *A. anatinus* and *A. taprobanensis*; in presence of emarginated apex of ventrite 5 from *A. anatinus*, in nine-segmented antennae from *A. taprobanensis*. Shares dark brown to black pronotum and coarse ground punctation of pronotum and elytra with *A. ater*; shares dark colored pronotum also with some individuals of *A. constrictus*; differs from *A. ater* in yellow elytra, and less wide extended metafemoral pubescence. Differs from all species of the group in comparatively longer maxillary palpomeres (ratio palpomeres/pronotum = 1.4) and aedeagus (e.g. acuminate apex of parameres).

DESCRIPTION: Total length: 1.7–2.1 mm; elytral width: 0.8–0.9 mm; E.I.: 1.4, P.I.: 1.9–2.0, elytra 3.1 times as long as pronotum. Habitus (Fig. 9) slender, elytra slightly widening posterior of midlength, weakly convex.

Coloration: Labrum, clypeus and frons black, clypeus with clearly defined, yellow, preocular patches about as wide as diameter of eye; maxillary palpi yellow, palpomere 4 apically infuscated; pronotum dark brown with undefined narrow yellow lateral margins; elytra yellow, undefined darker areas present in some cases; ventrites dark brown; legs yellow to light brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 3.6, lateral length ratio clypeus/eyes = 1.5; microsculpture absent; ground punctures moderately coarse, interspaces 1–2 times as wide as punctures, systematic punctures indistinct. Eyes large, slightly protruding, oval. Antennae with nine antennomeres. Maxillary palpi slender, 1.4 times as long as pronotum in midline, 1.1–1.2 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.2–1.3, palpomere 4 slightly asymmetrical. Mentum with coarse and fine punctures mixed, evenly distributed.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral ground punctation as on head and pronotum, four rows of systematic punctures indistinct. Mesoventrite with mesal bulge.

Femora (Fig. 53): Pubescence present on less than proximal 2/3 of profemur, on proximal 2/3 of meso- and metafemur, hairlines slightly oblique on profemur, straight on meso- and metafemur.

Abdomen: Ventrite 5 with shallow apical emargination.

Aedeagus (Fig. 113): Length: 0.32–0.34 mm. Phallobase slightly shorter than parameres, slightly longer than wide, evenly narrowing proximad, without distinct manubrium; border between pigmented and unpigmented portion of ventral face almost reaching manubrium. Parameres knife-shaped, with almost straight margins, apex asymmetrical, pointed, basal portion slightly extending into phallobase. Median lobe moderately wide, finger-shaped, not reaching apex of

parameres, apical portion evenly rounded, corona situated subapically; styli present, delicate, unpigmented, concealed by lateral margins of median lobe in many cases; basal apophyses moderately long, slightly extending into phallobase.

ECOLOGY: The specimens were collected in streams between 300 and 400 m a.s.l., together with *A. boukali*, *A. obscuratus*, and *A. obsoletus*.

DISTRIBUTION (Fig. 152): India (Kerala).

ETYMOLOGY: The name *cinnamum* (Lat.) (= cardamom) is used as noun in apposition and refers to the Cardamom Hills (Kerala, India) where the type specimens were collected.

Agraphydrus communis sp.n.

TYPE LOCALITY: Nepal, Central Region, Sindhupalchok District, torrent above Tatobani near Kodari.

TYPE MATERIAL: **Holotype** ♂ (NMW): "NEPAL 1.3. {19}81 \ Tibetan. Grenze {= near border to Tibet} \ leg. M. Jäch N31"; the specimen was collected in a small torrent above Tatobani, 1–2 m wide, ca. 1800 m a.s.l., flowing through dense primary forest. **Paratypes: NEPAL: Central Region:** 32 exs. (MHNG, MNW): same sampling data; 2 ♂♂, 1 ♀ (NMW): Bagmati Zone, Sindhupalchok Distr., at Tatobani, Bairavund Khola, right tributary of Sun Kosi River, ca. 1600 m a.s.l., 1.III.1981, leg. M.A. Jäch "N32"; 1 ex. (NMW): Bagmati Zone, Sindhupalchok Distr., above Tatobani, small spring within light forest, ca. 2000 m a.s.l., 3.III.1981, leg. M.A. Jäch "N38"; 2 exs. (NMW): Bagmati Zone, Sindhupalchok Distr., Dapkakharka, 2100 m a.s.l., 10.–12.VI.1989, leg. C. Holzschuh; **Eastern Region:** 1 ♂ (MHNG): Koshi Zone, forest NE Kuwapani, 2350 m a.s.l., sifting of leaves and humus near to a spring, 5.IV.1984, I. Löbl & A. Smetana; 1 ♂ (NMW): Koshi Zone, 2 km E Mangsingma, 1900 m a.s.l., sifting of moss and leaves, 19.IV.1984, leg. I. Löbl & A. Smetana; 1 ♀ (MNS): Mechi Zone, Taplejung Distr., Yamputhin, 1650–1800 m a.s.l., at bank, 26.IV.–1.V.1988, leg. J. Martens & W. Schawaller "351"; 2 ♂♂ (NMW): Sagarmatha Zone, Solukhumbu Distr., Gaikharka, Hinku Drangka (left tributary of Dudkoshi River), 1850 m a.s.l., 4.IV.1994, leg. S. Sharma "106"; 1 ♂, 1 ♀ (MNS): Sagarmatha Zone, Solukhumbu Distr., above Nunthala, 2500–2300 m a.s.l., at bank, 13.V.1997, leg. W. Schawaller "517"; **Western Region:** 4 ♀♀ (MTD): Gandaki Zone, Kaski Distr., Annapurna Mts., Siklis (village), 2000 m a.s.l., NE Pokhara, 15.V.1993, leg. J. Schmidt; 1 ex. (SEMC): Gandaki Zone, Kaski Distr., Annapurna, tributary of Madi Khola River near Kwinkal (ca. 10 km ENE Pokhara), ca. 28°13'55"N 84°5'16"E, ca. 750 m a.s.l., 15.V.1996, leg. O. Jäger; 17 exs. (NMW, MTD): Gandaki Zone, southeastern Annapurna Mts., Siklis Mts., torrent at Kyojo-Kharka, 1850 m a.s.l., 28.VI.1996, leg. O. Jäger; 1 ♂ (MTD): Gandaki Zone, Pokhara, 800 m a.s.l., 30.V.–1.VI.1996, leg. D. Ahrens, T. Kulbe, M. Rulik; 2 ♂♂, 3 ♀♀ (SEMC, MTD): Gandaki Zone, Annapurna, N Pokhara, Kali Khola, below Garland (village), 1000–1200 m a.s.l., 18.IV.1996, leg. O. Jäger; 1 ♂ (MTD): Gandaki Zone, Annapurna Mts., N Pokhara, Garland, 1500 m a.s.l., 25.VII.1995, leg. O. Jäger; 5 exs. (MTD): Gandaki Zone, Annapurna Mts., N Pokhara, small river near Siklis, 2200 m a.s.l., 24.IV.1996, leg. O. Jäger; 4 exs. (MTD, NMW): Gandaki Zone, Annapurna south slope, Madi Khola Valley, river above Khilang (village), 1950 m a.s.l., 12.–13.V.1996, leg. O. Jäger; 4 ♀♀ (MTD): Gandaki Zone, Mt. Panchase, 15 km W Pokhara, E exposed stream above Sidhane, 2000 m a.s.l., 18.V.1997, leg. O. Jäger; 8 exs. (MTD): Gandaki Zone, Mt. Panchase, 15 km W Pokhara, E exposed stream near Sidhane, 1500–1700 m a.s.l., 15.V.1997, leg. O. Jäger; 7 ♂♂, 1 ♀ (MTD, NMW): Gandaki Zone, southern Annapurna Mts., ca. 20 km W Pokhara below Mt. Panchase, 1800 m a.s.l., 16.V.1997, leg. O. Jäger; 1 ♂ (MTD): Gandaki Zone, Mt. Panchase, 15 km W Pokhara, E exposed stream above Sidhane, 1700–1800 m a.s.l., 16.V.1997, leg. O. Jäger; 1 ♂ (NME): Gandaki Zone, Annapurna, Mt. Panchase, W Pokhara, 2000–2300 m a.s.l., 18.V.1997, leg. J. Schmidt; 5 ♂♂, 3 ♀♀ (MTD): Gandaki Zone, 20 km W Pokhara, Mt. Panchase, NE slope, temporary forest stream, 2300 m a.s.l., 20.V.1997, leg. O. Jäger; 6 exs. (MTD, NMW): Gandaki Zone, Annapurna Mts., Telbrung Danda (NE Pokhara, Siklis villages), E exposed stream valley NE Gangpokhara, 2000 m a.s.l., 15.VI.1997, leg. O. Jäger; 6 exs. (MTD): Gandaki Zone, Annapurna Mts., NE Pokhara, S below Krapa Danda, 1800–1900 m a.s.l., 27./28.V.1997, leg. O. Jäger; 2 ♀♀ (MTD): Gandaki Zone, Lamjung Distr., Annapurna Mts., Madi Khola, "Ufertümpel an Wasserkraftstation {pool at hydropower station} Siklis", 1500 m a.s.l., 10.V.1996, leg. O. Jäger; 1 ♂ (MTD): Gandaki Zone, Annapurna Mts., Madi Khola Valley near Siklis, small stream near Hogo Kharka, 1900–2000 m a.s.l., 4.V.1996, leg. O. Jäger; 1 ♂ (NMW): Gandaki Zone, Annapurna Mts., torrent, 2 km N Bahandanda, 26.VIII.1995, leg. O. Jäger; 2 ♀♀ (MTD): Gandaki Zone, Annapurna Mts., Madi Khola Valley N Siklis, river near Kyojo Kharka, 1900 m a.s.l., 2.V.1996, leg. O. Jäger; 17 exs. (SEMC, 15 MTD): Gandaki Zone, Lamjung Distr., S Annapurna, Madi Khola Valley, 3 km N Siklis, stream below Dhara Kharka, 1750 m a.s.l., 26.IV.1996, leg. O. Jäger; 2 ♂♂ (1 NMW, MTD): Gandaki Zone, Annapurna, Siklis Mts., N Pokhara, Nyauli Kharka, small stream, 2400–2500 m a.s.l., 22.IV.1996, leg. O. Jäger;

11 ♂♂, 4 ♀♀ (MTD): Dhaulagiri Prov., Myagdi Distr., Dhaulagiri-Himal, Rahughat Khola (stream, tributary of Kali Gandaki River) Valley, 7 exs. are in addition labelled “e-slope”, Jhin (village), 28°25'N 83°30'E, two males are labelled: “N28°25.34' E83°30.73'”, 1500–1750 m a.s.l., 16.VI.1998, leg. O. Jäger; 1 ♂ (MNS): Mechi Zone, Taplejung Distr., Yamputin, 1650–1800 m a.s.l., collected at bank, 26.IV.–1.V.1988, leg. J. Martens & W. Schawaller “351”; 9 exs. (NMW): Gandaki Zone, Kaski Distr., 20 km NW Pokhara, Lumle, 1600 m a.s.l., leg. G. Wewalka, 2.V.1984 “N2”; 1 ♂ (NMW): Dhaulagiri Zone, Baglung Distr., Annapurna Mts., Baglung Lekh, 10–15 km W Pokhara, Baglung, 2300–2550 m a.s.l., 10.–12.VI.2004, leg. J. Schmidt; 29 exs. (NMW): Gandaki Zone, Gorkha Distr., Manaslu Mts., Bara Pokhari Lekh, Chhandi Khola Valley, 2000–2200 m a.s.l., 11./12.IV.2003, leg. J. Schmidt; 1 ♂ (NMW): Gandaki Zone, Kaski Distr., 15 km NW Pokhara, Phewa Valley surr., leg. G. Wewalka, 14.V.1984 “N22”; 3 ♂♂, 2 ♀♀ (NMW): Gandaki Zone, Kaski Distr., 25 km NW Pokhara, Landrung, 1500–2000 m a.s.l., leg. G. Wewalka, 12.V.1984 “N20”. **BHUTAN:** 1 ♂ 2 ♀♀ (NMW): Sarpang Prov., Geylephug – Shemgang road, ca. 10 km NNE of Geylephug Town, 26°56'43"N 90°31'29"E, ca. 400 m a.s.l., stream, ca. 3 m wide, with several furcations, steep, flowing from forest, 26.XI.2005, leg. M.A. Jäch “29”; 1 ♂ (NMW): Sarpang Prov., eastern slope of Damphu-Sarpang Pass, ca. 14 km SE Damphu Town, 26°56'21"N 90°13'32"E, ca. 1365 m a.s.l., small stream, ca. 1 m wide, through steep and narrow, forested gorge, 26.XI.2005, leg. M.A. Jäch “26”; 3 ♂♂, 6 ♀♀ (NMW): Tsirang Prov., Dhara Chhu, eastern slope of Sarpang – Damphu Pass, ca. 13 km SE of Damphu Town, 26°56'52"N 90°12'35"E, ca. 1700 m a.s.l., stream, ca. 2 m wide, through steep gorge, large boulders, degraded forest, 27.XI.2005, leg. M.A. Jäch “31”. **INDIA: Uttarakhand:** 1 ♂ (NHM): W-Almora, Kumaon, India, leg. H.G. Champion; 3 exs. (NMW): Bageshwar Distr., streams near Goulna, ca. 11–13 km N Bageshwar, 29°54'44"N 79°50'01"E and 29°54'33"N 79°49'29"E, 1000–1020 m a.s.l., 14.XI.2006, leg. M.A. Jäch “21a+b”; 15 exs. (NMW): Chamoli Distr., Bhauri River, left tributary of Nadakini River, ca. 5 km E Nandaprayag, 30°16'54"N 79°23'16"E, 1120 m a.s.l., ca. 5 m wide, with large boulders, flowing through shady gorge, 12.XI.2006, leg. M.A. Jäch “10”.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with microsculpture present along anterior margin of clypeus and unicolored yellow maxillary palpomeres, together with *A. communis*, *A. crassipennis*, *A. pauculus*, *A. protentus*, *A. stagnalis*, and some specimens of *A. kempfi*. Shares similar aedeagus (inflated apex of parameres) with *A. kempfi*, differs in very narrow rim of shagreenation along anterior clypeal margin, interrupted mesally in most specimens (largely extended on anterior third or half of clypeus in most individuals of *A. kempfi*). Differs from *A. stagnalis* in larger size (*A. stagnalis*: 2.0–2.3 mm), slightly broader habitus and in slightly stronger ground punctation. A similar aedeagus is also present in *A. audax*, *A. arduus*, and *A. igneus*; differs from *A. arduus* and *A. igneus* in absence of shagreenation on lateral margin of pronotum, from *A. audax* in finer ground punctation, from *A. igneus* also in larger size (*A. igneus*: 2.1–2.2 mm) and in black coloration of clypeus (*A. igneus*: ferruginous), from *A. arduus* in broader habitus and in stout maxillary palpi.

DESCRIPTION: Total length: 2.4–2.9, elytral width: 1.2–1.5 mm; E.I.: 1.3–1.4, P.I.: 2.2–2.4, elytra 2.8–3.5 times as long as pronotum. Habitus (Fig. 10) moderately broad, elytra parallel-sided to slightly rounded, moderately convex.

Coloration: Labrum brown or black, clypeus and frons black, clypeus with yellow preocular patches about as wide as diameter of eye in most cases, rarely reduced to a narrow lateral light brown rim, in some individuals yellowish brown coloration extending over almost entire clypeus; maxillary palpi yellow, infuscations absent; pronotum largely dark brown to black, or with undefined dark brown mesal patch extending to level of eyes or wider, with variably wide yellowish brown lateral margins; lighter colored individuals occur; elytra dark brown or black, with undefined lighter colored lateral margins in some cases, or entirely lighter brown; ventrites dark brown to black; legs dark brown, entirely slightly lighter than ventrites, or distal portions of femora light brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 3.4–3.6, lateral length ratio clypeus/eyes = 1.8–2.1; microreticulation present on lateral margins and on narrow anterior rim; ground punctures fine, distinctly impressed, interspaces 1–2 times as wide as punctures, systematic punctures moderately distinct. Eyes large, not protruding, slightly oblong. Antennae with nine antennomeres. Maxillary palpi slender, 1.1–1.2 times as long as pronotum in midline, 0.9–1.0 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.2–1.4,

palpomere 4 slightly asymmetrical. Mentum with fine to moderately coarse punctures, grouped laterally.

Thorax: Pronotal ground punctation as on head or slightly finer, systematic punctures moderately distinct. Elytral ground punctation as on head, four rows of systematic punctures moderately distinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with strong mesal bulge gently arising from anterior margin, abruptly sloping between mesocoxae.

Femora (Fig. 54): Pubescence present on proximal 2/3 of profemur, on proximal 3/4 of meso- and metafemur, hairlines slightly oblique on pro- and mesofemur, straight on metafemur.

Abdomen: Ventrite 5 weakly sclerotized apically with shallow to almost semicircular apical emargination, about 10 µm deep.

Aedeagus (Figs. 114–115): Length: 0.37–0.41 mm. Phallobase slightly shorter than parameres, about as long as wide, abruptly bending to distinct, triangular manubrium; border between pigmented and unpigmented portion of ventral face reaching midlength of phallobase. Parameres wide, mesally distinctly concave for reception of median lobe; apex very wide, inflated, delicate, particularly mesally, apical region “shriveled” in many of the dry mounted specimens (Fig. 115); basal portion of base deeply reaching into phallobase. Median lobe wide at base, margins converging apicad; apex not reaching apex of parameres; corona situated at midlength; basal apophyses short, very narrowly separated, deeply extending into phallobase.

REMARKS: Very variable regarding body shape, dorsal coloration, and aedeagus (length of median lobe).

ECOLOGY: The specimens were found between 400 and 2550 m a.s.l. in rivers, torrents, permanent and temporary streams, springs, also by sifting in the vicinity of water bodies. In Bhutan they were collected together with *A. bhutanensis*, *A. crassipenis*, and *A. flavonotus*; in India together with *A. constrictus*, *A. indicus*, *A. kempi*, *A. pauculus*, and *A. pygmaeus*; in the Central Region of Nepal together with *A. indicus* and *A. pygmaeus*; in the Eastern Region together with *A. indicus*, *A. nepalensis*, and *A. pygmaeus*; in the Western Region together with *A. annapurnensis*, *A. indicus*, *A. kempi*, *A. pauculus*, *A. protentus*, *A. pygmaeus*, and *A. stagnalis*.

DISTRIBUTION (Fig. 152): Bhutan, India (Uttarakhand), Nepal (Central Region, Eastern Region, Western Region).

ETYMOLOGY: The name *communis* (Lat.) (= common) refers to the fact, that this species is very common in Nepal and Uttarakhand.

Agraphydrus connexus KOMAREK & HEBAUER, 2018

Agraphydrus connexus KOMAREK & HEBAUER 2018: 31.

TYPE LOCALITY: Malaysia, Pahang, Kuala Lipis (town) surroundings.

TYPE MATERIAL: See KOMAREK & HEBAUER (2018). **Paratypes from Indian Subcontinent: NEPAL: Eastern Region:** 6 exs. (MNS, NMW): Mechi Zone, Ilam Distr., 5 km N Sanishare, Siwalik Mts., 270–300 m a.s.l., collected at bank of stream, 3.–5.IV.1988, leg. W. Schawaller “308”.

ADDITIONAL MATERIAL EXAMINED:

B H U T A N: 2 ♂♂ (NMW): Sarpang Prov., Sarpang, stream, left tributary of Sarpang Khola, 26°52'05"N 90°15'52"E, ca. 330 m a.s.l., ca. 2 m wide, flowing through cultivated land and settlements, 26.XI.2005, leg. M.A. Jäch “28”.

I N D I A: **Madhya Pradesh:** 4 exs. (NMW): Hoshangabad Distr., southern Madhya Pradesh, Panar Pani (stream), Matkuli – Pachmarhi road, ca. 5 km NNE Pachmarhi (small town) ca. 30 km S Piparia (town), 22°30'25"N 78°26'43"E, 850 m a.s.l., ca. 3–5 m wide, substrate: gravel and rocks, flowing through forest, 26./27.II.2008, leg. M.A. Jäch, S. & P. Sharma “MP6”.

DIFFERENTIAL DIAGNOSIS: Belongs to species with microsculpture on clypeus extended on at least anterior half and unicolorous yellow maxillary palpomeres. Shares brown color of pronotum and elytra, small size, fine ground punctures and black clypeus with preocular patches with *A. obscuratus* and *A. bhutanensis*. Very light colored individuals are similar also to *A. annapurnensis* and *A. flavonotus*. For differences to other Oriental species see KOMAREK & HEBAUER (2018). Differs from all species of *Agraphydrus* in the aedeagus (presence of distinct connecting band between median lobe and parameres).

DESCRIPTION: See KOMAREK & HEBAUER (2018). Femora, palpus and aedeagus as in Figs. 55, 97, 116.

REMARKS: Specimens from Madhya Pradesh differ from specimens from Nepal and Southeast Asia in darker coloration of pronotum and finer ground punctation of pronotum and elytra.

ECOLOGY: In India, Nepal and Bhutan the specimens were found in streams between 270 and 850 m a.s.l.; in Bhutan they were collected together with *A. bhutanensis*, *A. indicus*, and *A. stagnalis*, in India together with *A. punctulatus*. In China and Southeast Asia (KOMAREK & HEBAUER 2018) they occur in streams, rivers, and various pools between sea level and 800 m a.s.l.

DISTRIBUTION (Fig. 151): Bhutan, India (Madhya Pradesh): first record; Nepal (Eastern Region), China (Hainan), Laos, Malaysia, Myanmar, Thailand, Vietnam (KOMAREK & HEBAUER 2018).

Agraphydrus constrictus sp.n.

TYPE LOCALITY: India, Uttarakhand, Chamoli District, Nandakini River, below Sedoli, ca. 10 km E Nandaprayag, 30°15'50"N 79°26'32"E.

TYPE MATERIAL: **Holotype** ♂ (NMW): "IND: Uttaranchal {Uttarakhand} \ Riv. Nandakini, Chamoli Dist. \ 30°15'50"N/79°26'32"E \ 12.XI.2006 \ leg. M.A. Jäch (11) | below Sedoli {village} \ ca. 10 km E Nandaprayag \ 836 {1290} m a.s.l."; the specimen was collected in a river flowing rather fast through a wide mountain valley, partly with large boulders, with two furcations at the sampling locality, each ca. 10 m wide. **Paratypes:** **INDIA: Uttarakhand:** 1 ♂ (NMW): same sampling data. **NEPAL: Central Region:** 4 exs. (NMW): Gorkha (Distr.), 26.–31.V.1992, leg. Ivo Jeniš; 1 ♂ (NHM): Dehradun, Rispana River, 4.XII.1927, leg. H.G. Champion; 1 ex. (NMW): W-Almora, Kumaon, leg. H.G. Champion; 2 ♂♂ (NMW): Almora Distr., Kosi River, ca. 1 km upstream of Hawalbagh (village), ca. 8 km WNW Almora (town), 29°39'21"N 79°38'04"E, 1160 m a.s.l., ca. 20–30 m wide, with furcations, 15.XI.2006, leg. M.A. Jäch "24"; 1 ♂ (NMW): Nainital Distr., Kalsa River, at Chanpi (village), ca. 6 km N Bhimtal (town), 29°22'22"N 79°34'43"E, 1230 m a.s.l., ca. 3–10 m wide, flowing through gravel bed, up to 30 m wide, partly with larger boulders, 16.XI.2006, leg. M.A. Jäch "27"; **Assam:** 6 exs. (NMP): 1.5 km S of Kohora (= Kaziranga Village), 26°34'34"N 93°24'23"E, 160 m a.s.l., sandy margins of slowly running stream with sparse vegetation, and of small puddles on shore without vegetation, 16.–18.IV.2008, leg. M. Fikáček, H. Podskalská & P. Šípek "1". **NEPAL: Western Region:** 38 exs. (SEMC, MTD, NMW): Gandaki Zone, Gorka Distr., Annapurna Mts., Pokhara – Pame, 800 m a.s.l., 18.V. 1996, leg. J. Schmidt & O. Jäger; 10 exs. (MTD, NMW): Gandaki Zone, Gorkha Distr., Dumre, river and edge pools, 17.VI.1997, leg. O. Jäger; 1 ex. (CSH): Narayani Zone, Chitwan Distr., Sauraha, 27°34'80"N 84°29'49"E, bank of Rapti River, at light, 18.IV.2000, leg. A. Weigel; 1 ♂ (CAS): Narayani Zone, Makwanpur Distr., 9 miles W Hetauda, 400 m a.s.l., 23.XI.1961, leg. E.S. Ross & D.Q. Cavagnaro.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with apical infuscation on maxillary palpomere 4, metafemoral pubescence present on at least proximal half, and absence of clypeal microsculpture, together with *A. anatinus*, *A. ater*, *A. cinnamum*, *A. coomani*, *A. heinrichi*, and *A. taprobanicus*. Very similar also to *A. ishiharai* (MATSUI, 1994) and *A. robustus* (KOMAREK & HEBAUER 2018) including aedeagus; differs in lighter coloration and finer ground punctures of pronotum and elytra; from *A. robustus* moreover in length of median lobe (not reaching apex of parameres in *A. robustus*). Differs in absence of mesoventral carina, wider extension of metafemoral pubescence, and aedeagus (e.g. presence of styli) from *A. anatinus* and *A. taprobanensis*; in presence of emarginated apex of ventrite 5 from *A. anatinus*; in nine-

segmented antennae from *A. taprobanensis*; in yellow elytra from *A. ater*; in fine ground punctures from *A. ater* and *A. cinnamum*; in comparatively shorter maxillary palpi from *A. cinnamum*. Differs in strong subapical constriction of parameres from all species of the group from Indian Subcontinent.

DESCRIPTION: Total length: 1.9–2.0 mm; elytral width: 0.8–0.9 mm; E.I.: 1.4, P.I.: 2.0–2.1, elytra 3.1–3.3 times as long as pronotum. Habitus (Fig. 11) moderately slender, widest at midlength, moderately convex.

Coloration: Labrum, clypeus and frons black, clypeus with clearly defined, yellow, preocular patches about as wide as diameter of eye; maxillary palpi yellow, palpomere 4 apically infuscated; pronotum yellow, unicolored or with indistinct infuscations, mainly mesally; elytra yellow; ventrites dark brown; legs yellow to light brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 2.9, lateral length ratio clypeus/eyes = 1.4; microsculpture absent; ground punctures fine, interspaces 2–3 times as wide as punctures, systematic punctures indistinct. Eyes large, slightly protruding, oval to slightly oblong. Antennae with nine antennomeres. Maxillary palpi slender, 1.0–1.1 times as long as pronotum in midline, 0.9 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.2–1.3, palpomere 4 asymmetrical. Mentum with very fine, evenly distributed punctures.

Thorax: Pronotal ground punctation as on head, systematic punctures indistinct. Elytral ground punctation as on head and pronotum, four rows of systematic punctures indistinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with mesal bulge.

Femora (Fig. 56): Pubescence present on proximal 2/3 of femora, hairlines oblique on pro- and mesofemur, straight on metafemur.

Abdomen: Ventrite 5 with almost semicircular apical emargination.

Aedeagus (Fig. 117): Length: 0.28–0.31 mm. Phallobase about as long as parameres, slightly longer than wide, bending to weakly defined manubrium; border between pigmented and unpigmented portion of ventral face almost reaching manubrium. Parameres moderately wide, with sigmoidal margins, with strong subapical constriction, apex obliquely flattened with strong lateral extension; dorsal face weakly extending into phallobase. Median lobe narrow, dorsal face bottle-shaped with bluntly rounded apex, reaching apex of parameres; corona in apical position; styli present, delicate; basal apophyses moderately long, weakly extending into phallobase.

ECOLOGY: The specimens were found in rivers, streams, edge pools, puddles, and at light, between 160 and 1290 m a.s.l.; in Nepal they were collected together with *A. kempfi* and *A. stagnalis*; and in India (Uttarakhand) together with *A. communis*, *A. indicus*, *A. kempfi*, *A. pauculus*, *A. pygmaeus*, and *A. stagnalis*.

DISTRIBUTION (Fig. 151): India (Uttarakhand), Nepal (Central Region, Western Region).

ETYMOLOGY: The name *constrictus* (Lat.) (= constricted) refers to the shape of the parameres.

***Agraphydrus coomani* (ORCHYMONT, 1927)**

Helochares (*Agraphydrus*) *coomani* ORCHYMONT 1927: 248.

Agraphydrus coomani (ORCHYMONT): WATTS 1995: 115; KOMAREK & HEBAUER 2018: 34.

Agraphydrus (s.str.) *coomani* (ORCHYMONT): HANSEN 1999: 156.

Enochrus ryukyuensis MATSUI 1994: 217; KOMAREK & HEBAUER 2018: 34 (syn.).

Agraphydrus ryukyuensis (MATSUI): GENTILI, HEBAUER, JÄCH, Ji & SCHÖDL 1995: 208.

Agraphydrus (s.str.) *ryukyuensis* (ORCHYMONT): HANSEN 1999: 157.

TYPE LOCALITY: Vietnam, Hoa Binh Province, Lac Tho.

TYPE MATERIAL: See KOMAREK & HEBAUER (2018).

ADDITIONAL MATERIAL EXAMINED:

SRI LANKA: 1 ♂ (ZML): Sabaragamuwa Prov., Ratnapura Distr., Bopath Ella Falls, 9 miles NNW Ratnapura, at light, 40 m a.s.l., 19.II.1962, leg. P. Brinck, H. Andersson, L. Cederholm "loc.91:II"; 1 ♀ (ZML): Eastern Prov., Kokagala Mt., 20 miles N Bibile, stream, sandy ground, ca. 50 m a.s.l., 13.III.1962, leg. P. Brinck, H. Andersson, L. Cederholm "Loc. 139"; 1 ♀ (NMW): Eastern Prov., Inginiyagala, 25 miles E Bibile, at light, ca. 75 m a.s.l., 8.–9.III.1962, leg. P. Brinck, H. Andersson, L. Cederholm "Loc. 126".

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with apical infuscation on maxillary palpomere 4, metafemoral pubescence present on at least proximal half, and absence of clypeal microsculpture, together with *A. anatinus*, *A. ater*, *A. cinnamum*, *A. constrictus*, *A. heinrichi*, and *A. taprobanicus*. Differs in absence of mesoventral carina, wider extension of metafemoral pubescence from *A. anatinus* and *A. taprobanensis*; in emarginated ventrite 5 from *A. anatinus*; in nine-segmented antennae from *A. taprobanensis*; in yellow elytra from *A. ater*; in fine ground punctures from *A. ater* and *A. cinnamum*; in comparatively shorter maxillary palpi from *A. cinnamum*. Very similar to *A. heinrichi*, shares slender parameres with evenly rounded, slightly inclining apex; differs in slightly more slender habitus (E.I.: 1.4; *A. heinrichi*: E.I.: 1.3), less wide extended femoral pubescence, and narrower parameres.

DESCRIPTION: See KOMAREK & HEBAUER (2018). Femora and aedeagus as in Figs. 57, 118.

ECOLOGY: In Sri Lanka the specimens were found in a stream and at light, between 40 and 75 m a.s.l.

DISTRIBUTION (Fig. 156): Sri Lanka (Eastern Province, Sabaragamuwa Province): first record; widespread in the Oriental and Australian regions (KOMAREK & HEBAUER 2018).

***Agraphydrus crassipenis* sp.n.**

TYPE LOCALITY: Nepal, Eastern Region, Kosi (= Koshi) Zone, Sunsari District, Dharan (city) environment.

TYPE MATERIAL: **Holotype** ♂ (NMW): "NEPAL \ 12.2. {19}81 N10 {handwritten} \ Dahran {Dharan} Umg. \ leg. M. Jäch"; the specimen was collected in the gravel along the bank of Sardu River. **Paratypes:** **NEPAL:** **Eastern Region:** 3 ♂♂ (NMW): same sampling data. **BHUTAN:** 1 ♂, 3 ♀♀ (NMW): Sarpang Prov., Geylephug – Shemgang road, ca. 10 km NNE of Geylephug (town), 26°56'43"N 90°31'29"E, ca. 400 m a.s.l., stream, ca. 3 m wide, with several furcations, steep, flowing from forest, 26.XI.2005, leg. M.A. Jäch "29"; 3 ♂♂ (NMW): Sarpang Prov., Bhur Khola, 11 km NW of Sarpang; 26°55'23"N 90°23'51"E, ca. 350 m a.s.l., river ca. 30 m wide, gravel banks, furcations; 27.XI.2005, leg. M.A. Jäch "30".

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with microsculpture present along anterior margin of clypeus and unicolored yellow maxillary palpomeres, together with *A. communis*, *A. pauculus*, *A. protentus*, *A. stagnalis*, and some specimens of *A. kempi*. Differs in unique aedeagus (median lobe stout, very wide, parameres short with strong apical extension).

DESCRIPTION: Total length: 2.3 mm; elytral width: 1.0 mm; E.I.: 1.3, P.I.: 2.0, elytra 2.9 times as long as pronotum. Habitus (Fig. 12) moderately broad, evenly oval, moderately convex.

Coloration: Labrum, clypeus and frons black, lateral margins of clypeus narrowly yellow; maxillary palpi unicolored yellow, infuscation absent; pronotum dark brown to black, margins narrowly yellow; elytra dark brown, or light brown with dark brown sublateral band, undefined, narrow yellow lateral margins present; ventrites black; legs brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 3.6, lateral length ratio clypeus/eyes = 2.0; microreticulation present on anterior and lateral margins, ground punctures fine, interspaces about two times as wide as punctures, systematic punctures distinct. Eyes moderately large, not protruding, oblong. Antennae with nine antennomeres. Maxillary palpi slender,

1.1–1.2 times as long as pronotum in midline, 1.0–1.1 as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.3, palpomere 4 asymmetrical. Mentum with rather coarse punctures, with denser distribution laterally, without microsculpture.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral ground punctation as on head and pronotum, four rows of systematic punctures distinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with distinct mesal bulge.

Femora (Fig. 58): Pubescence present on more than proximal half of profemur; on proximal 2/3 of meso- and metafemur, hairlines slightly oblique on pro- and mesofemur, straight on metafemur.

Abdomen: Ventrite 5 with almost semicircular apical emargination.

Aedeagus (Fig. 119): Length: 0.23–0.25 mm. Phallobase longer than parameres, as long as wide, abruptly bending to triangular manubrium; border between pigmented and unpigmented portion of ventral face almost reaching manubrium. Parameres stout, very wide basally, apex with large delicate shoe-shaped lateral extension, dorsal face reaching into phallobase, ventral face distinctly shorter than dorsal face. Median lobe wide, delicate; apex blunt, not reaching apex of parameres; corona situated subapically; basal apophyses rather long, distinctly extending into phallobase.

ECOLOGY: The specimens were found in rivers, streams, and pools, between 350 and 400 m a.s.l.; in Bhutan they were collected together with *A. bhutanensis*, *A. communis*, *A. flavonotus*, *A. indicus*, and *A. kempfi*; in Nepal together with *A. kempfi*, *A. pullus*, and *A. stagnalis*.

DISTRIBUTION (Fig. 152): Bhutan, Nepal (Eastern Region).

ETYMOLOGY: The name *crassus* (Lat.) (= thick) refers to the broad shape of the aedeagus.

Agraphydrus exedis (ORCHYMONT, 1937)

Helochares (*Agraphydrus*) *exedis* ORCHYMONT 1937a: 29.

Agraphydrus (s.str.) *exedis* (ORCHYMONT): HANSEN 1999: 156.

TYPE LOCALITY: India, Maharashtra, Pune District, Khandala.

TYPE MATERIAL: **Holotype** (not examined): According to ORCHYMONT (1937a) labelled: “Bombay Presidency, Poona District, Khandala, altitude ca. 2500 ft., 6.–10.III.1918, among damp algae on cliff at edge of waterfall (leg. N. Annandale), male, 2 x 1 mm, No. 3802/H4”. Probably deposited in the IMK, which is not accessible at present. **Paratypes** (examined): 3 ♂♂, 1 ♀ (ISNB): “Bombay Pres. \ Poona District \ Khandala \ ca. 2500 ft. \ 6.–10.III.1918 \ (leg. N. Annandale) {handwritten} | among damp \ algae on cliff \ at edge of \ waterfall {handwritten} | {yellow card:} Coll. I. R. Sc. N. B. \ Inde | {red card:} A. d’Orchymont \ *Helochares* \ *Agraphy* - \ *drus exedis* m.”. According to ORCHYMONT (1937a) the paratypes are from the type locality: “same locality, same collector, a few specimens, No. 3803–3805/H4”.

ADDITIONAL MATERIAL EXAMINED:

I N D I A: **Madhya Pradesh**: 4 exs. (NMW): Hoshangabad Distr., southern Madhya Pradesh, Bee Stream, above Bee Dam, Pachmarhi Wildlife Sanctuary, Satpura Mountain Range, ca. 3 km WNW Pachmarhi, 22°28'20"N 78°24'54"E, 970 m a.s.l., ca. 1–2 m wide, substrate: rock, gravel, flowing through forest, 27.II.2008, leg. M.A. Jäch, S. & P. Sharma “MP9”.

DIFFERENTIAL DIAGNOSIS: Shares nine-segmented antennae, unicolored palpomeres, absence of clypeal microsculpture, elytra with milky shine, very fine ground punctation, extended femoral pubescence, and emarginated ventrite 5 with *A. kodaguensis*, differs in minor size (*A. kodaguensis*: 2.7–3.1 mm body length), and aedeagus (e.g. shape of parameres).

DESCRIPTION: Total length: 2.7–3.1 mm; elytral width: 1.3–1.5 mm; E.I.: 1.2, P.I.: 2.1, elytra 2.5–2.7 times as long as pronotum. Habitus (Fig. 13) broad, evenly oval, moderately convex.

Coloration: Labrum, clypeus, and frons black, clypeus with indistinct yellow preocular patches, less wide than eyes; maxillary palpi unicolored yellow; head, pronotum and elytra with milky sheen; pronotum black with undefined, wide, yellow lateral and anterior margins; elytra black with narrow yellowish undefined lateral margins and slightly lighter colored posterior region; ventrites and legs black.

Head: Clypeus with distinctly concave anterior margin, C.I.: 4.1, lateral length ratio clypeus/eyes = 1.9; microreticulation absent, ground punctures very fine, very weakly impressed, interspaces 1–2 times as wide as punctures, systematic punctures indistinct. Eyes large, very slightly protruding, slightly oblong. Antennae with nine antennomeres. Maxillary palpi slender, as long as pronotum in midline, 0.9 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.2, palpomere 4 slightly asymmetrical. Mentum with very fine, very widely spaced punctures, without microsculpture.

Thorax: Pronotal ground punctation as on clypeus, systematic punctures indistinct. Elytral ground punctation as on head and pronotum, four rows of systematic punctures indistinct, strongly reduced in number, not reaching anterior margin. Mesoventrite with distinct mesal bulge.

Femora (Fig. 59): Pubescence present on proximal 2/3 of profemur with oblique hairline, on proximal 3/4 of meso- and metafemur with straight hairlines.

Abdomen: Ventrite 5 with very shallow apical emargination.

Aedeagus (Fig. 120): Length: 0.39–0.40 mm. Phallobase less than half as long as parameres, about as wide as long, abruptly bending to narrow manubrium; border between pigmented and unpigmented portion of ventral face exceeding midlength of phallobase. Parameres with strong subapical constriction, lateral margin with tooth-like extension subapically; apex blunt, not inflated, slightly inclining mesad; distinctly extending into phallobase mesally. Median lobe rather narrow, weakly narrowing towards bluntly rounded apex, not reaching apex of parameres; corona situated at midlength; basal apophyses long.

ECOLOGY: The specimens were found in streams and at the edge of a waterfall between 760 and 970 m a.s.l.

DISTRIBUTION (Fig. 151): India (Madya Pradesh, Maharashtra).

Agraphydrus falcatus sp.n.

TYPE LOCALITY: India, Tamil Nadu, Dindigul District, Palni Hills, Kodaikanal, Pallangi, ca. 10°15'N 77°30'E.

TYPE MATERIAL: **Holotype** ♂ (NMW): “S-INDIEN, 20.12.1993 \ Kerala, Palni hills \ Kodaikanal (5), Pallangi, 1900 m, | 77°30'E 10°15'N \ leg. Boukal & Kejval {Palni Hills, Kodaikanal (town), Pallangi (village), and GPS data are located in Tamil Nadu}”. **Paratypes:** **INDIA: Kerala:** 1 ♀ (NMW): Idukki Distr., 10 km WSW Munnar, Kallar Valley, 1100–1200 m a.s.l., 10°03'N 76°58–59'E, 7.–8.I.1999, leg. D. Boukal “49/52”; 6 exs. (NMW): Idukki Distr., 10 km WSW Munnar, Kallar Valley, 10°03'N 76°59'E, 1200 m a.s.l., large stream; probably “49” upstream (large elevation difference), at examined site ca. 5 m wide, shallow, boulders, large stones, bed with stones, gravel, silt; leaves, moderately to slowly flowing, rather unshaded, draining degraded forest with cardamom plantations, 8.I.1999, leg. D. Boukal “52”; 5 exs. (NMW): close to loc. “52”, but hygropetric habitat, wet rock with leaves, very small discharge, 8.I.1999, leg. D. Boukal “53”; 1 ♀ (NMW): Idukki Distr., 10 km WSW Munnar, Kallar Valley, 10°03'N 76°59'E, 1300 m a.s.l., small stream, ca. 1 m wide, large stones (moss), slower runs with stones, gravel, silt, leaf packs, mod. flowing, shading variable, draining disturbed forest, Hydrophilidae on sandy-muddy shores, 7.I.1999, leg. D. Boukal “51”; **Tamil Nadu:** 1 ♀ (NMW): Dindigul Distr., road Palni – Kodaikanal, 28–29 km from Kodaikanal, 1500 m a.s.l., small pool, 30.XII.1994, leg. P. Mazzoldi; 1 ♀ (NMW): Dindigul Distr., Palni Hills,

Kodaikanal, Bear Shola Falls, 10°14'N 77°29'E, 2100 m a.s.l., small stream, narrow canyon, bed less than 1 m wide; bedrock, unstable gravel, moss on rock in moderate current, pools, partly shaded, draining degraded primary forest (shola), strongly polluted (detergents), 11.I.1999, leg. D. Boukal "58"; 8 exs. (NMW): Dindigul Distr., Palni Hills, Perumalmalai, 10°16'N 77°33'E, 1500 m a.s.l., small stream, less than 1 m wide, shallow, partly bedrock, partly stones, gravel, silt, some leaf packs, shading variable, moderately fast flowing, draining cultivated land, almost unpolluted, not obviously grooved, water partly diverted for irrigation, 12.I.1999, leg. D. Boukal "59"; 2 ♀♀ (NMW): Dindigul Distr., Palni Hills, Perumalmalai, 1600 m a.s.l., 10°16'N 77°33'E, small stream, less than 1 m wide, shallow, shading variable, moderately fast flowing, draining cultivated land, almost unpolluted, not obviously grooved, water partly diverted for irrigation, steep bedrock and levelled upper part, 12.I.1999, leg. D. Boukal "60"; 1 ♂, 1 ♀ (NMW): same geographical data, date and collector, but small stream in valley, less than 1 m wide, shallow, stones in runs (with moss), leaf packs, exposed (shore vegetation recently cut), channel straightened, partly grooved, draining cultivated land "61"; 8 exs. (NMW): Dindigul Distr., Palni Hills, Kodaikanal – Batlagundu road, Machur env., 10°16'N 77°35'E, 1200 m a.s.l., stream, 1 m wide, boulders, rocky bed, pools connected by short shallow runs with stones, pebbles, gravel, and leaf packs, in runs moderately fast flowing, along the stream a few small puddles and rock pools with rich leaf deposits, more upstream with rock pools and small waterfall, moderately shaded, draining cultivated land (*Eucalyptus*, coffee plantations, etc.), upper reaches somewhat polluted, probably with soap, 16.I.1999, leg. D. Boukal "68".

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with strongly reduced metafemoral pubescence, apical infuscation of maxillary palpomere 4, and presence of apical emargination of ventrite 5, together with *A. glaber*, *A. kallar*, *A. nanus*, *A. obsoletus*, *A. pullus*, *A. punctulatus*, and some individuals of *A. indicus*. Shares yellowish pronotum with *A. nanus*, differs in habitus (evenly oval) and wider extension of mesofemoral pubescence from *A. glaber* and *A. nanus*; differs from all other species mentioned in pronotal color (with wide yellowish margins and darker brown mesal area, in contrast to dark brown or black pronotum). Differs from *A. nanus* also in larger size (*A. nanus*: 1.4–1.5 mm body length), presence of nine-segmented antennae, and absence of mesoventral carina. Differs from all species in the aedeagus (parameres sickle-shaped).

DESCRIPTION: Total length: 1.8–2.1 mm; elytral width: 0.8–1.0 mm; E.I.: 1.4, P.I.: 2.1, elytra 3.1 times as long as pronotum. Habitus (Fig. 14) slender, evenly oval, strongly convex.

Coloration: Labrum, clypeus and frons dark rufous to black, clypeus with yellow lateral margins; maxillary palpomeres 1–3 yellow, palpomere 4 infuscated in apical third to apical half; pronotum yellow, unicolored or with undefined dark brown central patch, of variable extension, in most cases slightly trapezoidal, as large as interocular space anteriorly, wider posteriorly; elytra yellowish brown with variable infuscations, lateral margins and posterior region brighter than on disc; ventrites brown to black; legs lighter colored. Individuals with unicolored dark brown pronotum and elytra occur.

Head: Clypeus with weakly concave anterior margin, C.I.: 4.3, lateral length ratio clypeus/eyes = 1.9; microsculpture absent, ground punctures very fine, interspaces 2–4 times as wide as punctures, systematic punctures distinct. Eyes large, but not protruding, slightly oblong. Antennae with nine antennomeres, antennomere 4 minute. Maxillary palpi moderately slender, 0.9–1.1 times as long as pronotum in midline, 0.8–0.9 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.2–1.3, palpomere 4 almost symmetrical. Mentum with very fine punctures, without microsculpture.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral ground punctation slightly stronger than on head and pronotum, four rows of systematic punctures distinct, mesal rows 1–3 strongly reduced in number, not reaching anterior margin, additional loose row present along lateral margin. Mesoventrite with flat mesal bulge.

Femora (Fig. 60): Pubescence present on proximal half of profemur, on less than proximal half of mesofemur, absent on metafemur; hairlines straight on pro- and mesofemur.

Abdomen: Ventrite 5 with wide apical emargination.

Aedeagus (Fig. 121): Length: 0.30–0.34 mm. Phallobase shorter than parameres, about as long as wide, abruptly bending to long narrow triangular manubrium; border between pigmented and unpigmented portion of ventral face reaching midlength of phallobase; dorsal lobes large. Parameres wide, sickle-shaped; apex blunt, strongly inclining mesad; dorsal face slightly extending into phallobase; ventral lobe shorter than dorsal lobe, equally wide. Median lobe slender, less wide than parameres, lateral margins evenly converging to narrowly rounded apex, not reaching apex of parameres; corona situated subapically; styli present, not reaching apex of median lobe; basal apophyses moderately long, extending to distal third of phallobase.

ECOLOGY: The specimens were collected in streams, pools, and hygropetric habitats between 1100 and 2100 m a.s.l., in Kerala together with *A. gilvus*, *A. obsoletus*, and *A. rostratus*.

DISTRIBUTION (Fig. 153): India (Kerala, Tamil Nadu)

ETYMOLOGY: The name *falcatus* (Lat.) (= sickle-shaped) refers to the shape of the parameres.

Agraphydrus flavonotus sp.n.

TYPE LOCALITY: Bhutan, Sarpang Province, Geylephug – Shemgang road, 26°56'43"N 90°31'29"E.

TYPE MATERIAL: **Holotype** ♂ (NMW): “BHUTAN: Sarpang Prov. \ Geylephug – Shemgang rd. \ 10 km NNE of Geylephug, 400 m \ 26°56'43"N 90°31'29"E \ 26.11.2005, leg. M.A. Jäch (29)”; stream, ca. 3 m wide, with several furcations, steep, flowing from forest. **Paratypes**: BHUTAN: 1 ♂, 3 ♀♀ (NMW): same sampling data.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with completely shagreened clypeus and unicolored yellow maxillary palpomeres. Shares yellow pronotum and elytra with *A. annapurnensis* and *A. gilvus*. Differs from *A. annapurnensis* in broader habitus, and *A. gilvus* in nine-segmented antennae, from both species in the aedeagus (weak, blunt, extensions on apex of parameres).

DESCRIPTION: Total length: 1.9–2.3 mm; elytral width: 0.9–1.0 mm; E.I.: 1.2–1.4, P.I.: 2.1, elytra 2.8 times as long as pronotum. Habitus (Fig. 15) moderately broad, evenly oval, moderately convex.

Coloration: Labrum, clypeus and frons black, clypeus with yellow, triangular preocular patches about as wide as diameter of eye; maxillary palpi yellow, infuscations absent; pronotum yellowish brown with undefined central infuscation; elytra yellowish brown; ventrites and legs brown, distal portion of femora yellowish brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 3.6, lateral length ratio clypeus/eyes = 1.3; completely microreticulate; ground punctures obsolete on clypeus, very fine on frons, interspaces more than two times as wide as punctures, systematic punctures moderately distinct. Eyes large, very slightly protruding, oval. Antennae with nine antennomeres. Maxillary palpi slender, 1.2 times as long as pronotum in midline, as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.3–1.5, palpomere 4 almost symmetrical. Mentum with distinct, widely spaced punctures, grouped laterally.

Thorax: Pronotal ground punctation as on frons, systematic punctures indistinct. Elytral ground punctation as on frons and pronotum, four rows of systematic punctures indistinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with strong mesal bulge.

Femora (Fig. 61): Pubescence present on proximal 2/3 of profemur, on proximal 3/4 of meso- and metafemur, hairline slightly oblique on pro- and mesofemur, straight on metafemur.

Abdomen: Ventrite 5 with almost semicircular apical emargination, ca. 40 µm deep.

Aedeagus (Fig. 122): Length: 0.24–0.26 mm. Phallobase shorter than parameres, about as long as wide, abruptly bending towards triangular manubrium; border between pigmented and unpigmented portion of ventral face indistinct, reaching proximal third. Parameres moderately wide; apex flattened, with weak, blunt, lateral and mesal extension; basal portion weakly extending into phallobase. Median lobe about as wide as parameres, evenly narrowing apicad; dorsal face deeply split into two longitudinal parts; ventral face delicate, longer than dorsal face, apex reaching apex of parameres; corona situated slightly distal of midlength; basal apophyses reaching midlength of phallobase.

ECOLOGY: The specimens were found in a stream at 400 m a.s.l., together with *A. bhutanensis*, *A. communis*, and *A. crassipennis*.

DISTRIBUTION (Fig. 153): Bhutan.

ETYMOLOGY: The name *flavonotus* is a compound adjective (*flavus* (Lat.) = yellow; *nōton* (Greek) = back) and refers to the yellow color of pronotum and elytra.

Agraphydrus fortis sp.n.

TYPE LOCALITY: Sri Lanka, Uva Province, Monaragala District, Gowinda Hela (a giant rock mountain known also as Westminster Abbey).

TYPE MATERIAL: **Holotype** ♂ (ZML): “Ceylon \ Province of Uva \ Westminster Abbey \ 24 mls. ESE Bibile \ 12.III.{19}62, Loc.119 III | on rock covered by \ trickling water | Lund University \ Ceylon Expedition 1962 \ Brinck – Andersson – \ Cederholm \ MZLU \ 2015 \ 281”. **Paratypes**: 3 ♀♀ (NMW, ZML): “Ceylon \ Central Prov. \ stream 2 mls. E Madugoda \ 16 mls E Kandy \ 12.III.{19}62, Loc.134 | small stream | Lund University \ Ceylon Expedition 1962 \ Brinck – Andersson – \ Cederholm”.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with completely shagreened clypeus, unicolored maxillary palpomeres, and dark colored pronotum and elytra, together with *A. bhutanensis*, *A. meghalayanus*, *A. obscuratus*, and some specimens of *A. connexus* and *A. kempii*. Differs from all these species in larger size, stronger ground punctures of pronotum and elytra, shorter maxillary palpi (shorter than pronotum in midline), equal length of palpomeres 3 and 4, absence of emargination of abdominal ventrite 5 and in the aedeagus (basal lobe distinctly larger than parameres and median lobe). A very coarse ground elytral punctation is also present in *A. rugosus* which differs in absence of clypeal microsculpture and in the aedeagus (e.g. absence of distinct manubrium, length of basal lobe).

DESCRIPTION: Total length: 2.8–3.0 mm; elytral width: 1.4–1.5 mm; E.I.: 1.4, P.I.: 2.1, elytra 3.1 times as long as pronotum. Habitus (Fig. 16) slender, evenly oval, strongly convex.

Coloration: Labrum, clypeus and frons black, clypeus with undefined, dark yellow preocular patches, less wide than eye; maxillary palpi unicolored yellow; pronotum dark brown to black with undefined narrow yellow lateral margins; elytra dark brown to black with undefined yellowish lateral margins and posterior portion; ventrites and legs dark brown to black, femora with brighter distal portions.

Head: Clypeus with distinctly concave anterior margin, lateral length ratio clypeus/eyes = 1.5, with strong microsculpture, present also on some areas of frons, ground punctures very coarse, distinctly impressed, interspaces about as wide as punctures, systematic punctures moderately distinct. Eyes large, but not protruding, oblong. Antennae with nine antennomeres. Maxillary palpi (Fig. 98) moderately slender, 0.9 times as long as pronotum in midline, 0.9 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.0, palpomere 4 almost symmetrical. Mentum slightly wrinkled, punctures obsolete, without microsculpture.

Thorax: Pronotal punctures coarse, interspaces two times as wide as punctures, systematic punctures distinct. Elytral ground punctation distinctly stronger than on pronotum, interspaces smaller than punctures, which are partly even confluent. Four rows of systematic punctures indistinct, strongly reduced in number, mainly in anterior portion, but present at elytral base. Mesoventrite with distinct bulge, abruptly sloping posteriorly.

Femora (Fig. 62): Pubescence present on proximal 2/3–3/4 of profemur, slightly more extended on meso- and metafemora, hairlines straight.

Abdomen: Ventrite 5 without apical emargination.

Aedeagus (Fig. 123): Length: 0.60 mm. Phallobase longer than parameres, longer than wide, evenly narrowing to large, undefined manubrium; border between pigmented and unpigmented portion of ventral face indistinct, reaching midlength of phallobase. Parameres with weakly sigmoidal margins; apex blunt, not inflated, asymmetrical, slightly inclining mesad; dorsal face slightly extending into phallobase mesally; ventral face larger than dorsal face. Median lobe wide basally, with narrow knob-shaped apex, not quite reaching apex of parameres; corona large, in basal position; basal apophyses moderately short, slightly extending into phallobase.

ECOLOGY: The specimens were found in a small stream and in a hygropetric habitat, at 450 and 800 m a.s.l.

DISTRIBUTION (Fig. 156): Sri Lanka (Uva Province).

ETYMOLOGY: The name *fortis* (Lat.) (= strong) refers to the strongly punctured elytra.

Agraphydrus gilvus sp.n.

TYPE LOCALITY: India, Kerala, Kallar Valley, 10 km WSW Munnar, 10°3'N 76°59'E.

TYPE MATERIAL: **Holotype** ♂ (NMW): “INDIA: Kerala, 7.1.1999 \ 10 km WSW Munnar, 1200 m \ Kallar Valley, 10°03'N 76°59'E \ leg. D. Boukal (51)”; the specimen was collected in a moderately fast flowing small stream, ca. 1 m wide, with large mossy stones, in slower runs with stones, gravel, silt, leaf packs, variably shaded, draining disturbed forest, Hydrophilidae found on sandy and muddy shores. **Paratype**: **INDIA: Kerala**: 1 ♂ (NMW): same sampling data.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with entirely shagreened clypeus, unicolored yellow maxillary palpomeres and unicolored yellow pronotum and elytra, together with *A. annapurnensis* and *A. flavonotus*. Differs from these species in eight-segmented antennae. Shares body size, yellow coloration of pronotum and elytra, large eyes, number of eight antennomeres, and a similar aedeagus with *A. orientalis* (ORCHYMONT, 1932) from Indonesia. Differs in more extended clypeal microsculpture (*A. orientalis*: microreticulation present on anterior half), slightly less extended meso- and metafemoral pubescence, and less wide apex of parameres.

DESCRIPTION: Total length: 2.0 mm; elytral width: 1.1 mm; E.I.: 1.2–1.4, P.I.: 2.2, elytra 2.9 times as long as pronotum. Habitus (Fig. 17) broad, evenly oval, moderately convex.

Coloration: Labrum yellowish brown, clypeus and frons black, clypeus with triangular preocular patches about as large as diameter of eye; maxillary palpi yellow, infuscations absent; pronotum and elytra unicolored yellow; ventrites and legs light brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 4.0, lateral length ratio clypeus/eyes = 2.0; almost completely microreticulate, ground punctures fine, interspaces about 1–2 times as wide as punctures, systematic punctures indistinct. Eyes moderately sized, not protruding, slightly oblong. Antennae with eight antennomeres. Maxillary palpi moderately slender, 1.1 times as long as pronotum in midline, 0.9 times as long as maximum width of clypeus, length

ratio of palpomeres 4:3 = 1.5–1.6, palpomere 4 slightly asymmetrical. Mentum with very fine, very widely spaced punctures, situated on lateral portions, without microsculpture.

Thorax: Pronotal ground punctation as on frons, systematic punctures moderately distinct, Elytral ground punctation as on head and pronotum, four rows of systematic punctures indistinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with mesal bulge.

Femora (Fig. 63): Pubescence present on more than proximal half of pro- and metafemur, on proximal 2/3 of mesofemur, hairlines oblique on pro- and mesofemur, straight on metafemur.

Abdomen: Ventricle 5 with very shallow apical emargination.

Aedeagus (Fig. 124): Length: 0.28–0.30 mm. Phallobase about as long as parameres, as wide as long; margins abruptly bending to wide manubrium; border between pigmented and unpigmented portion of ventral face extending into more than midlength of phallobase. Parameres slightly wider at base than at apex; margins almost straight; apex bluntly rounded, not inflated; basal portion distinctly extending into phallobase mesally; ventral face slightly wider than dorsal face. Median lobe wide, evenly converging to blunt apex, reaching apex of parameres; corona situated subapically; basal apophyses short, reaching midlength of phallobase.

ECOLOGY: The specimens were found in a small stream at 1200 m a.s.l., together with *A. falcatus* and *A. obsoletus*.

DISTRIBUTION (Fig. 151): India (Kerala).

ETYMOLOGY: The name *gilvus* (Lat.) (= yellow) refers to the coloration of pronotum and elytra.

Agraphydrus glaber sp.n.

TYPE LOCALITY: India, Madhya Pradesh, Hoshangabad District, ca. 5 km NE Hoshangabad, ca. 60 km SSE Bhopal, Bandrabhan, Narmada River, 22°48'1"N 77°46'45"E.

TYPE MATERIAL: **Holotype** ♂ (NMW): "INDIA: (MP5) southern \ Madhya Pradesh \ Hoshangabad Dist. \ Bandrabhan, 25.II.2008 \ leg. M. Jäch, S. & P. Sharma | ca. 60 km SSE Bhopal \ ca. 5 km NE Hoshangabad \ River Narmada, ca. 285 m \ 22°48'01"N 77°46'45"E"; the specimen was collected in the Narmada River above junction with Tawa River, ca. 50 m wide, with cataracts, riffles and rock pools. **Paratypes**: **INDIA: Madhya Pradesh**: 1 ♂ (NMW): same sampling data; 2 exs. (NMW): Bhopal Distr., Central Madhya Pradesh, Kalia Sood (reservoir), southern part of Bhopal City, 23°12'00"N 77°24'29"E, 490 m a.s.l., margins: sand, mud, 3.III.2008, leg. M.A. Jäch, S. & P. Sharma "MP20"; 4 exs. (NMW): Indore Distr., southwestern Madhya Pradesh, Choral Nadi (= Charal Nadi River), NW of Choral (= Charal, village), Indore – Barwah road, Vindhya Mountain Range, ca. 20 km SSE Indore, 22°27'50"N 75°55'42"E, 350 m a.s.l., ca. 3–10 m wide, flowing through degraded forest, substrate: gravel, sand, mud, 1.III.2008, leg. M.A. Jäch, S. & P. Sharma "MP17".

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with strongly reduced metafemoral pubescence, presence of apical infuscation of maxillary palpomere 4, and presence of apical emargination of ventrite 5, together with *A. falcatus*, *A. kallar*, *A. nanus*, *A. obsoletus*, *A. pullus*, *A. punctulatus*, and some individuals of *A. indicus*. Shares similar habitus (parallel-sided or posteriorly slightly widening elytra in contrast to evenly oval elytra), less wide extended mesofemoral pubescence, and absence of styli on median lobe with *A. nanus*; differs in black pronotum, non-carinate mesoventrite, larger size (*A. nanus*: 1.4–1.5 mm long), and aedeagus (median lobe club-shaped, apex not acuminate).

DESCRIPTION: Total length: 1.9 mm; elytral width: 0.8 mm; E.I.: 1.5, P.I.: 1.9, elytra 3.1 times as long as pronotum. Habitus (Fig. 18) slender, elytra parallel-sided to slightly widening posteriorly, moderately convex.

Coloration: Labrum, clypeus, and frons black; maxillary palpomere 4 with infuscation in apical half; pronotum black, very slightly, very narrowly brightened at margins; elytra black, indistinctly brightened apically; ventrites and legs black.

Head: Clypeus with weakly concave anterior margin, C.I.: 3.0, lateral length ratio clypeus/eyes = 1.6; microsculpture absent, ground punctures fine, weakly impressed, interspaces two times as wide as punctures, systematic punctures indistinct. Eyes large, very slightly protruding, slightly oblong. Antennae with eight antennomeres. Maxillary palpi slender, 1.3 times as long as pronotum in midline, 1.1 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.3, palpomere 4 symmetrical. Mentum with very few, very fine punctures.

Thorax: Pronotal punctures as on head, systematic punctures indistinct. Elytral punctures as on head and pronotum, four rows of systematic punctures indistinct, mesal rows reduced in number, not reaching anterior margin. Mesoventrite with mesal bulge.

Femora (Fig. 64): Pubescence present on proximal half of profemur, strongly restricted to narrow anterior rim and to proximal region adjacent to trochanter on meso- and metafemur.

Abdomen: Ventrite 5 with hemispherical emargination apically.

Aedeagus (Fig. 125): Length: 0.30–0.31 mm. Phallobase about as long as parameres, longer than wide, evenly converging proximad; distinct manubrium absent; border between pigmented and unpigmented portion of ventral face almost reaching proximal end. Parameres narrow; apex acuminate, slightly inclining mesad, dorsal face indistinctly extending into phallobase mesally. Median lobe with club-shaped dorsal face, narrow proximal, widening distad, with bluntly rounded apex; styli or shield-shaped structure absent; ventral face distinctly wider; corona situated in distal third; basal apophyses moderately long, extending into distal third of phallobase.

ECOLOGY: The specimens were found in rivers and in a reservoir, between 285 and 490 m a.s.l.

DISTRIBUTION (Fig. 152): India (Madhya Pradesh).

ETYMOLOGY: The name *glaber* (Lat.) (= glabrous, bald) refers to the reduced meso- and metafemoral pubescence.

Agraphydrus heinrichi sp.n.

TYPE LOCALITY: India, Kerala, Thiruvananthapuram District, Cardamom Hills, 50 km NW Pathanamthitta, near Pambaiyar River, ca. 9°25'N 77°5'E.

TYPE MATERIAL: **Holotype** ♂ (NMW): “S-INDIEN, Kerala \ Cardamom Hills, 300 m \ 50 km NW Panthanamthitta \ 77°05'E 09°25'N | Large Stream near \ Pambaiyar River \ 27.–29.12.1993 (12) \ leg. Boukal & Kejval”. **Paratype** 1 ♂ (NMW): same sampling locality, at light, 6.–9.V.1994, leg. Z. Kejval.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with apical infuscation on maxillary palpomere 4, metafemoral pubescence present on at least proximal half, and absence of clypeal microsculpture, together with *A. anatinus*, *A. ater*, *A. cinnamum*, *A. constrictus*, *A. coomani*, and *A. taprobanicus*. Differs in absence of mesoventral carina, wider extension of metafemoral pubescence from *A. anatinus* and *A. taprobanensis*; in presence of apical emargination on ventrite 5 from *A. anatinus*; in nine-segmented antennae from *A. taprobanensis*; in yellow elytra from *A. ater*; in fine ground punctures from *A. ater* and *A. cinnamum*; in comparatively shorter maxillary palpi from *A. cinnamum*. Very similar to *A. coomani*, shares slender parameres with evenly rounded, slightly inclining apex, differs in slightly broader habitus (E.I.: 1.3; *A. coomani*: E.I.: 1.4), slightly larger extension of femoral pubescence, and wider parameres. Similar also to *A. comes* KOMAREK & HEBAUER, 2018 and *A. confusus*

KOMAREK & HEBAUER, 2018; differs in broader habitus (*A. comes*: E.I.: 1.6; *A. confusus*: E.I.: 1.5) and in shape of parameres.

DESCRIPTION: Total length: 1.9 mm; elytral width: 0.9 mm; E.I.: 1.3, P.I.: 2.0, elytra 2.9 times as long as pronotum. Habitus (Fig. 19) slender, elytra slightly widening posterior of midlength, weakly convex.

Coloration: Labrum, clypeus and frons black, clypeus with distinct, defined, triangular preocular patches, about as wide as eye; maxillary palpi yellow, palpomere 4 darkened in apical third; pronotum dark yellow, with undefined, dark brown, rarely black, central patch, of variable extension; elytra yellow; ventrites dark brown; legs yellow to light brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 3.2, lateral length ratio clypeus/eyes = 1.5; microsculpture absent, ground punctures fine, interspaces 2–3 times as wide as punctures, systematic punctures moderately distinct. Eyes large, slightly protruding, oval. Antennae with nine antennomeres. Maxillary palpi slender, as long as pronotum in midline, as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.4, palpomere 4 slightly asymmetrical. Mentum with very fine, very widely spaced punctures, without microsculpture.

Thorax: Pronotal ground punctation as on head, systematic punctures indistinct. Elytral ground punctation as on head and pronotum, four rows of systematic punctures indistinct, mesal rows 1–3 strongly reduced in number, not reaching anterior margin. Mesoventrite with low bulge.

Femora (Fig. 65): Pubescence present on proximal 2/3 of femora, hairline slightly oblique on profemur, straight on meso- and metafemur.

Abdomen: Ventrite 5 with narrow, almost semicircular apical emargination.

Aedeagus (Fig. 126): Length: 0.32 mm. Phallobase slightly shorter than parameres, about as long as wide, evenly narrowing to minute manubrium; border between pigmented and unpigmented portion of ventral face almost reaching manubrium. Parameres moderately wide at base, margins almost parallel in proximal half, narrowing in distal half to blunt asymmetrical apex; base slightly extending into phallobase. Median lobe as wide as parameres, finger-shaped; apex bluntly rounded, not reaching apex of parameres; ventral face wider and shorter than dorsal face; corona situated subapically; styli present, not reaching apex; basal apophyses moderately long, slightly extending into phallobase.

ECOLOGY: The specimens were found in a large stream and at light, at 300 m a.s.l., together with *A. boukali*, *A. nanus*, *A. obscuratus*, and *A. obsoletus*.

DISTRIBUTION (Fig. 153): India (Kerala).

ETYMOLOGY: The species is dedicated to the late Dr. Heinrich Schönmann (NMW) who collected and described many species of Hydrophilidae.

Agraphydrus hygropetricus sp.n.

TYPE LOCALITY: Sri Lanka, Western Province, 24 miles ESE Colombo, Labugama (village).

TYPE MATERIAL: **Holotype** ♂ (ZML): “Ceylon, W. Prov., \ Labugama, \ 24 mls ESE Colombo \ 21.I.19;62. Loc. 17:1 | On rocks covered by \ trickling water | Lund University \ Ceylon Expedition 1962 \ Brinck – Andersson – \ Cederholm | MZLU \ 2015 \ 276”.

DIFFERENTIAL DIAGNOSIS: Shares strongly convex habitus, eight-segmented antennae, unicolored palpomeres, absence of clypeal microsculpture, coarse ground punctation, extended femoral pubescence, and absence of emargination on ventrite 5 with *A. pygmaeus*; differs in less broad habitus and larger extension of femoral pubescence. Shares eight-segmented antennae, unicolored yellow maxillary palpomeres, absence of clypeal microsculpture, extended femoral

pubescence, and absence of excision on ventrite 5 also with *A. fujianensis* KOMAREK & HEBAUER, 2018, *A. fasciatus* KOMAREK & HEBAUER, 2018, and *A. wangmiaoi* KOMAREK & HEBAUER, 2018.

DESCRIPTION: Total length: 2.1 mm; elytral width: 0.9 mm; E.I.: 1.4, P.I.: 2.0, elytra 3.1 times as long as pronotum. Habitus (Fig. 20) slender to moderately broad, elytra slightly widening posterior of midlength, strongly convex.

Coloration: Labrum, clypeus, and frons black; clypeus with indistinct, weakly defined yellow preocular patches, slightly smaller than width of eye; maxillary palpi unicolor yellow; pronotum and elytra rufous with narrow undefined yellow lateral margins; ventrites black; legs and epipleura rufous.

Head: Clypeus with weakly concave anterior margin, C.I.: 3.8, lateral length ratio clypeus/eyes = 1.6; microsculpture absent, ground punctures coarse, distinctly impressed, interspaces 1–2 times as wide as punctures, systematic ground punctation indistinct. Eyes large, but not protruding, slightly oblong. Antennae with eight antennomeres. Maxillary palpi moderately slender, as long as pronotum in midline, 0.8–0.9 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.2, palpomere 4 slightly asymmetrical. Mentum with obsolete ground punctation, without microsculpture.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral ground punctation as on head and pronotum, four subserial rows of coarser punctures indistinct, mesal rows 1–3 strongly reduced in number, not reaching anterior margin. Mesoventrite with mesal bulge.

Femora (Fig. 66): Pubescence present on proximal 2/3 of profemur, on proximal 3/4 of mesofemur, on proximal 2/3 of metafemur; hairlines oblique on pro- and mesofemur, straight on metafemur.

Abdomen: Ventrite 5 very weakly sclerotized at apex, emargination absent.

Aedeagus (Fig. 127): Length: 0.33 mm. Phallobase as long as parameres, without manubrium, about as long as wide; margins evenly rounded; dorsal face with very large right and left portions almost meeting in midline; border between pigmented and unpigmented portion of ventral face not reaching midlength of phallobase, manubrium absent. Parameres wide basally, with distinctly sigmoid lateral margin and almost straight mesal margin; apex with strong, blunt, lateral extension; dorsal face distinctly reaching into phallobase; ventral lobes wider than dorsal face. Median lobe with bottle-shaped dorsal face, wide basally, abruptly narrowing at midlength; ventral face distinctly wider, evenly converging to narrowly rounded apex; corona in basal position; basal apophyses long, widely separated, extending almost to midlength of phallobase.

ECOLOGY: The specimen was found in a hygropetric habitat, ca. 100–150 m a.s.l.

DISTRIBUTION (Fig. 156): Sri Lanka (Western Province).

ETYMOLOGY: The name *hygropetricus* (Lat.) (= hygropetric) refers to the habitat.

***Agraphydrus indicus* (ORCHYMONT, 1932)**

Helochares (*Gymnelochares*) *indicus* ORCHYMONT 1932: 694.

Agraphydrus (*Gymnelochares*) *indicus* (ORCHYMONT): HANSEN 1999: 157; HANSEN 2004: 49; FIKÁČEK et al. 2015: 61.

TYPE LOCALITY: India, Uttarakhand, Kumaon Division, Haldwani District.

TYPE MATERIAL: **Holotype** ♂ (NMW): “HALDWANI Dist. \ Kumaon India. \ H.G. CHAMPION | Knisch det.1925 \ *pygmaeus* m.”. **Paratypes:** 2 ♂♂, 1 ♀ (NMW): same label data.

ORCHYMONT (1932: 693) mentions a total of six specimens, all deposited under the name *Helochares pygmaeus* in the collection of Alfred Knisch (1885–1926, coleopterist in Vienna, Austria). Four of these specimens, 3 ♂♂, 1 ♀, (most probably belonging to the type series) were retrieved in the NMW. They did, however, not carry any type labels or any identification labels written by Orchymont. The depository of the holotype (“Typus, ein {one} ♂”) was not indicated by ORCHYMONT (1932) and no such specimen carrying an identification label of Orchymont could be found in the NMW, ISNB and NHM. Therefore I decided to select one of the three males from the Knisch collection (NMW) as holotype. The whereabouts of the remaining two specimens are unknown.

ADDITIONAL MATERIAL EXAMINED:

- I N D I A: Uttarakhand:** 101 exs. (NHM, NMW, ZMUC): Kumaon Division, Nainital Distr., Haldwani, leg. H.G. Champion; 1 ex. (NHM): Kumaon Division, W-Almora, leg. H.G. Champion; 1 ex. (NHM): Kumaon Division, Almora Distr., Gumti, IV.1919, leg. H.G. Champion; 1 ex. (NHM): Kumaon Division, Pithoragarh Distr., Gori River Gorge, 5–9000 ft., leg. H.G. Champion; 1 ♂ (NMW): Bageshwar Distr., Saryu River, at Falda (village), ca. 15 km north of Bageshwar (town), 29°55'11"N 79°52'8"E, 1005 m a.s.l., ca. 20–30 m wide, partly with larger boulders, 14.XI.2006, leg. M.A. Jäch “19”; 6 exs. (NMW): Chamoli Distr., Bhauri River, left tributary of Nadakini River, ca. 5 km E Nandaprayag, 30°16'54"N 79°23'16"E, 1120 m a.s.l.; ca. 5 m wide, with large boulders, flowing through shady gorge, 12.XI.2006, leg. M.A. Jäch “10”; 1 ♂ (NMW): Chamoli Distr., Kalia (river), left tributary of Pindar River, at Simli (village), ca. 5 km E Karanprayag, 30°14'23"N 79°15'00"E, 840 m a.s.l., ca. 5–7 m wide, rather low discharge, flowing from steep slope, quite strongly impacted by human droppings, 12.XI.2006, leg. M.A. Jäch “12”; **Arunachal Pradesh:** 12 exs. (NMP): 1 km N of Bhalukpong, 27°01'21"N 92°38'06"E, 240 m a.s.l., seepage, wet rock with moss and *Nostoc* below steep slope with tropical evergreen forest, 7.–8.V.2008, leg. M. Fikáček, H. Podskalská & P. Šípek “16a”; **Himachal Pradesh:** 7 exs. (NHM, NMW): Mandi Distr., Jhatingri, 6000 ft., leg. H.G. Champion; **Meghalaya:** 3 exs. (NMW): SW of Cherrapunjee, 25°13–14'N 91°40'E, 5–24.V.2005, 900 m a.s.l., leg. P. Pacholátko; 12 exs. (NMP): East Khasi Hills Distr., 11 km SW Cherrapunjee, Laitkynsew, 1.5–2.0 km on road from “Cherrapunjee Holiday Resort” in direction Cherrapunjee, 25°13'N 91°39'E, 810 m a.s.l., exposed, seepage, wet rocks with algae, blue algae, and moss, 21.–24.IV.2008, leg. M. Fikáček, H. Podskalská & P. Šípek “10”.
- N E P A L: Central Region:** 2 ♂♂ (NMW): Bagmati Zone, Sindhupalchok Distr., at Tatobani, unshaded small spring brook, flowing between rice terraces, 1.III.1981, leg. M.A. Jäch “N30”; 1 ♀ (NMW): Bagmati Zone, Sindhupalchok Distr., above Tatobani, small torrent, 1–2 m wide, flowing through dense primary forest, ca. 1800 m a.s.l., 1.III.1981, leg. M.A. Jäch “N31”; 1 ♀ (NMW): Bagmati Zone, Sindhupalchok Distr., above Tatobani, small spring within light forest, ca. 2000 m a.s.l., 3.III.1981, leg. M.A. Jäch “N38”; 5 exs. (NME, NMW): Bagmati Zone, Langtang Valley, Syabru Bensi – Barkhu, 1500–1700 m a.s.l., 20.IX.1996, leg. M. Hartmann; 1 ♂ (MTD): Gandaki Zone, Mt. Panchase, 15 km W Pokhara, E exposed stream above Sidhane, 2000 m a.s.l., 18.V.1997, leg. O. Jäger; 1 ♂ (MTD): Gandaki Zone, Mt. Panchase, 15 km W Pokhara, E exposed stream near Sidhane, 1500–1700 m a.s.l., 15.V.1997; **Eastern Region:** 14 exs. (NMW): Koshi Zone, Arun Valley, Num, 1050 m a.s.l., sifting of leaves and deadwood from steep slope above river, 20.IV.1984, leg. I. Löbl & A. Smetana; 5 exs. (MHNG): Koshi Zone, Arun Valley, Num, 1100 m a.s.l., lateral gorge, sifting of leaves on boulders, 21.IV.1984, leg. I. Löbl & A. Smetana; 1 ♀ (MHNG): Koshi Zone, Induwa Kola Valley, sifting of moss and leaves near to a spring, 1750 m a.s.l., 14.IV.1984, leg. I. Löbl & A. Smetana; 1 ♀ (MHNG): Koshi Zone, Induwa Kola Valley, 2000 m a.s.l., at bank of river, 16.IV.1984; 10 exs (MHNG): Koshi Zone, 2 km E Mangsingma, 1900 m a.s.l., sifting of moss and leaves, 19.IV.1984, leg. I. Löbl & A. Smetana; 8 exs. (MNS): Koshi Zone, Sankhuwasabha Distr., Arun Valley, between Hedangna and Num, 6.–8.VI.1988, 950–1000 m a.s.l., leg. J. Martens & W. Schawaller “408”; 1 ♀ (MNS): Mechi Zone, Taplejung Distr., confluence Kabeli and Tada Khola, 23.–25.V.1988, 1050 m a.s.l., leg. J. Martens & W. Schawaller “344”; 1 ♂ (MNS): Mechi Zone, Taplejung Distr., from Iwa Khola Bridge to Sablako Pass, 940–1200 m a.s.l., stream bank, 22.IV.1988, leg. J. Martens & W. Schawaller “338”; 9 exs. (NME, NMW): Mechi Zone, Taplejung Distr., 24 km NE Taplejung, Sekathum, Camp, 27°32'10"N 87°48'29"E, 1550 m a.s.l., 6.V.2003, leg. A. Weigel; **Western Region:** 1 ♂ (CSH): Gandaki Zone, Manang Distr., way from Dharapani to Tal, 28°31'14"N 84°21'23"E, 1920 m a.s.l., to 28°28'06"N 84°22'24"E. 1685 m a.s.l., 28.V.2013, leg. A. Kopetz “29”; 1 ♂ (NMW): Mustang Distr., left tributary of Kaligandaki River below Ghasa, 3.IV.1996, leg. W. Graf et al.
- B H U T A N:** 5 exs. (NMW): Sarpang Prov., Bhur Khola, 11 km NW of Sarpang, 26°55'23"N 90°23'51"E, ca. 350 m a.s.l., river ca. 30 m wide, gravel banks, furcations, 27.XI.2005, leg. M.A. Jäch “30”; 4 exs. (NMW): Sarpang Prov., Sarpang, stream, left tributary of Sarpang Khola, 26°52'05"N 90°15'52"E, ca. 330 m a.s.l., ca. 2 m wide, flowing through cultivated land and settlements, 26.XI.2005, leg. M.A. Jäch “28”; 2 ♀♀ (NMW): Tsirang Prov., Neychey Chhu (river, left tributary of Puna Tsang Chhu), ca. 48 km SSE Wangdi Phodrang, 27°08'26"N 90°04'14"E, ca. 550 m a.s.l., ca. 5 m wide, fast flowing, through rocky gorge, 25.XI.2005, leg. M.A. Jäch “23”.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with strongly reduced metafemoral pubescence. Most specimens with apical infuscation on maxillary palpomere 4 and without

emargination on ventrite 5; individuals without infuscation of palpomere 4 and/or with weak emargination of ventrite 5 occur. Specimens with apically infuscated palpomere 4 and absence of emargination on ventrite 5 share black pronotum and elytra with *A. nepalensis*; they differ in absence of styli and presence of shield-shaped structure on median lobe. Individuals with unicolored palpomeres similar to *A. angustipennis*, *A. boukali*, *A. ceylonensis*, *A. longipalpus*, and *A. calvus*; they differ in presence of eight-segmented antennae from *A. angustipennis*, *A. ceylonensis*, and *A. longipalpus*; in minor size (body length less than 2.2 mm) from *A. angustipennis* and *A. longipalpus*; most individuals differ in absence of emargination on ventrite 5 from *A. boukali* and *A. longipalpus*. Shares similar aedeagus with *A. calvus* (basal lobe shorter than parameres, median lobe with similarly shaped reinforcing plate, absence of styli), differs in comparatively shorter basal lobe (KOMAREK & HEBAUER 2018). Specimens with infuscated apex of palpomere 4 and emarginated ventrite 5 differ in black pronotum from *A. nanus* and *A. falcatus*; in habitus (broad, evenly oval, strongly convex) and wider extension of mesoventral pubescence from *A. nanus*, *A. glaber*, and *A. punctulatus*. Differs in distinct ground punctation of head and pronotum from *A. obsoletus*; in basal lobe (distinctly shorter than parameres) from *A. kallar* and *A. pullus*; in absence of styli on median lobe from *A. kallar* and *A. punctulatus*; in presence of shield-shaped structure from all species mentioned. Shares habitus, coloration, number of antennomeres, and absence of excision on ventrite 5 with *A. pygmaeus*; differs from this species in reduced metafemoral pubescence, presence of apical infuscation on maxillary palpomere 4, and in the aedeagus (e.g. slender parameres).

DESCRIPTION: Total length: 1.7–2.1 mm; elytral width: 0.9–1.1 mm; E.I.: 1.2–1.3, P.I.: 2.3–2.5, elytra 2.9–3.1 times as long as pronotum. Habitus (Fig. 21) broad, evenly oval, strongly convex.

Coloration: Labrum, clypeus, and frons black; maxillary palpomere 4 with apical infuscation, indistinct or absent in some specimens; pronotum and elytra black, narrow rufous lateral margin present in some individuals; ventrites and legs black.

Head: Clypeus with distinctly concave anterior margin, C.I.: 4.2, lateral length ratio clypeus/eyes = 1.6; microsculpture absent, ground punctures fine, strongly impressed, interspaces 1–2 times as wide as punctures, systematic punctures distinct. Eyes large, not protruding, slightly oblong. Antennae with eight antennomeres. Maxillary palpi (Fig. 99) moderately slender, as long as pronotum in midline, 0.9 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.2, palpomere 4 symmetrical. Mentum with fine punctures, grouped laterally.

Thorax: Pronotal punctures as on head, systematic punctures distinct. Elytral punctures slightly stronger than on head and pronotum, interspaces about as wide as punctures, four rows of systematic punctures distinct, mesal rows reduced in number, not reaching anterior margin. Mesoventrite with mesal bulge.

Femora (Fig. 67): Pubescence present on proximal half of profemur, on slightly less than proximal half of mesofemur, with straight hairlines; pubescence restricted to narrow anterior rim and proximal region adjacent to trochanter on metafemur.

Abdomen: Ventrite 5 very shallowly emarginated, or emargination absent.

Aedeagus (Fig. 128): Length: 0.29–0.34 mm. Phallobase distinctly shorter than parameres, about as long as wide, bending to moderately long, narrow manubrium; border between pigmented and unpigmented portion of ventral face indistinct. Parameres narrow; apex acuminate, distinctly inclining mesad; basal portion distinctly extending into phallobase mesally. Median lobe narrow; dorsal face finger-shaped with bluntly rounded apex; ventral face indistinct, delicate, wider than dorsal face; corona in distal third; styli absent; shield-shaped structure with large triangular apical indentation present in basal half, arising from base of median lobe; basal apophyses moderately long, distinctly extending into phallobase, bending laterad.

REMARKS: Individuals from Bhutan differ slightly from individuals from India and Nepal in median lobe (weak indentation present on apex of ventral face of median lobe and slightly different shield-shaped structure with weaker apical indentation).

ECOLOGY: The specimens were found in rivers, streams, springs, spring brooks, and small torrents between 240 m and 2740 m a.s.l.; also by sifting in the vicinity of water bodies. In Bhutan they were collected together with *A. bhutanensis*, *A. connexus*, *A. crassipennis*, *A. kempii*, and *A. stagnalis*; in Uttarakhand together with *A. communis*, *A. constrictus*, *A. kempii*, *A. pauculus*, *A. pygmaeus*, and *A. stagnalis*; in the Eastern Region of Nepal together with *A. communis*, *A. nepalensis*, *A. pauculus*, and *A. pygmaeus*; in the Western Region together with *A. communis* and *A. pygmaeus*.

DISTRIBUTION (Fig. 153): Bhutan: first record, India (Arunachal Pradesh, Himachal Pradesh, Meghalaya, Uttarakhand), Nepal (Central Region, Eastern Region, Western Region): first record.

Agraphydrus inflatus sp.n.

TYPE LOCALITY: India, Kerala, Idukki District, Cardamom Hills, Kallar Valley, 15 km SW Munnar, ca. 10°02'N 76°58'E.

TYPE MATERIAL: **Holotype** ♂ (NMW): "S-INDIEN Kerala \ Cardamom Hills \ 15 km SW Munnar \ 76°58'E 10°02'N | Kallar Valley \ 6.-18.12.1993 \ 1000 m (7) \ leg. Boukal & Kejval"; the specimen was collected in a stream. **Paratypes**: **INDIA: Kerala**: 1 ♂ (NMW): same sampling data; **Tamil Nadu**: 1 ♂ (MHNG): Coimbatore Distr., Anaimalai Hills, 18 km N Valparai, 1250 m a.s.l., 8.XI.1972, leg. C. Besuchet, I. Löbl & R. Mussard.

DIFFERENTIAL DIAGNOSIS: Shares strongly convex habitus, nine-segmented antennae, unicolored palpomeres, absence of clypeal microsculpture, coarse ground punctation, extended femoral pubescence, and absence of emargination on ventrite 5 with *A. rostratus*, *A. rugosus*, *A. tumulosus* and *A. uvaensis*; differs in minor size and equal, less coarse ground punctation of pronotum and elytra from *A. rugosus* and *A. uvaensis*.

DESCRIPTION: Total length: 2.1 mm; elytral width: 1.1 mm; E.I.: 1.3–1.4, P.I.: 2.1–2.2, elytra 3.1 times as long as pronotum. Habitus (Fig. 22) slender, elytra parallel-sided, widest behind midlength, strongly convex.

Coloration: Labrum, clypeus dark brown to black, lateral margins narrowly yellow, frons black; maxillary palpi unicolored yellow; pronotum and elytra rufous to dark brown; ventrites and legs light brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 4.1, lateral length ratio clypeus/eyes = 1.5–1.6; microsculpture absent, ground punctures coarse, distinctly impressed, interspaces 2–3 times as wide as punctures, systematic punctures moderately distinct. Eyes large, but not protruding, slightly oblong. Antennae with nine antennomeres. Maxillary palpi stout, 0.9 times as long as pronotum in midline, 0.8 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.0–1.2, palpomere 4 symmetrical. Mentum with very fine widely separated punctures, without microsculpture.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral punctures coarse, stronger than on head and pronotum, interspaces 1–2 times as wide as punctures, four rows of systematic punctures moderately distinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with distinct mesal bulge.

Femora (Fig. 68): Pubescence present on proximal 2/3 of femora with straight hairlines.

Abdomen: Ventrite 5 without apical emargination.

Aedeagus (Fig. 129): Length: 40 mm. Phallobase shorter than parameres, about as long as wide; manubrium narrow; border between pigmented and unpigmented portion of ventral face indistinct. Parameres with slender dorsal face and distinctly wider ventral face; lateral margins distinctly sigmoid; apex inflated with widely rounded lateral portion and narrow medial corner; dorsal face not reaching midlength of phallobase mesally. Median lobe wide basally, evenly narrowing towards bluntly rounded apex, reaching apex of parameres; dorsal face distinctly wider and much shorter than ventral face, corona large, situated at midlength; basal apophyses narrow, widely separated, extending into distal third of basal lobe.

ECOLOGY: The specimens were found at 1000–1250 m a.s.l.; in Kerala the specimens were collected in a stream together with *A. boukali* and *A. obsoletus*.

DISTRIBUTION (Fig. 153): India (Kerala, Tamil Nadu).

ETYMOLOGY: The name *inflatus* (Lat.) (= inflated) refers to the enlarged apex of the parameres.

Agraphydrus kallar sp.n.

TYPE LOCALITY: India, Kerala, Thiruvananthapuram District, 30 km NNE Thiruvananthapuram, Kallar, ca. 8°45'N 77°5'E.

TYPE MATERIAL: **Holotype** ♂ (NMW): “INDIA: Kerala, 30.12.1998 \ {ca.} 30 km NNE Trivandrum {Thiruvananthapuram}, 400 m \ Kallar Bridge {ca.} 08°45'N 77°05'E \ leg. D. Boukal (27)”; the altitude is actually 150–200 m a.s.l. (D. Boukal, pers. comm.), the specimen was collected at the edge of a large stream along the Ponmudi – Kallar road, with large boulders, gravel, silt, some leaf packs, fast flowing, partly torrential, rather extensively shaded, draining disturbed primary forest. **Paratypes**: **INDIA: Kerala**: 5 exs. (NMW); same sampling data; 1 ♂ (NMW): Kerala, ca. 30 km NNE Thiruvananthapuram, Kallar, ca. 8°43'N 77°7'E, ca. 200 m a.s.l., 8°45'N 77°5'E, small stream, ca. 1 m wide, max. 10–20 cm deep, stones, gravel, silt, algal growth, leaf packs, current slow to moderate, fast in a few riffles, partly shaded, draining secondary forest and cultivated land, slightly polluted (refuse), almost unshaded, 3.I.1999, leg. D. Boukal “41”; 1 ♂ (NMW): ca. 30 km NNE Thiruvananthapuram, Kallar, 120–150 m a.s.l., ca. 8°43'N 77°7'E, leaves and other decaying plant matter along a small spring, partly very wet, shaded (bamboo), material sifted, 1.I.1999, leg. D. Boukal “37”.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with strongly reduced metafemoral pubescence, apical infuscation of maxillary palpomere 4, and presence of apical emargination of ventrite 5, together with *A. falcatus*, *A. glaber*, *A. nanus*, *A. obsoletus*, *A. pullus*, *A. punctulatus*, and some individuals of *A. indicus*. Differs in dark brown to black colored pronotum from *A. nanus* and *A. falcatus*; in wider extension of mesofemoral pubescence from *A. nanus*, *A. glaber*, and *A. punctulatus*; in distinct ground punctation from *A. obsoletus*. Differs from all species in the aedeagus (basal lobe as long as parameres, styli present).

DESCRIPTION: Total length: 1.5–1.8 mm; elytral width: 0.7–0.9 mm; E.I.: 1.3, P.I.: 2.1–2.2, elytra 3.0–3.2 times as long as pronotum. Habitus (Fig. 23) broad, evenly oval, strongly convex.

Coloration: Labrum, clypeus, and frons black; clypeus with narrow yellowish lateral margins; maxillary palpi yellow, palpomere 4 infuscated apically; pronotum dark brown to black with undefined, narrow yellow lateral margins; elytra dark brown, lighter brown in posterior half and lateral margins; ventrites black; legs dark brown.

Head: Clypeus with weakly concave anterior margin, C.I.: 4.3, lateral length ratio clypeus/eyes = 1.4; microsculpture absent, ground punctures very fine, widely spaced, systematic punctures distinct. Eyes large, not protruding, slightly oblong. Antennae with eight antennomeres. Maxillary palpi moderately slender, 0.9 times as long as pronotum in midline, 0.8 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.2, palpomere 4 almost symmetrical. Mentum with very fine punctures.

Thorax: Pronotal ground punctation very fine as on head, interspaces 3–4 times as wide as punctures, systematic punctures distinct. Elytral punctures fine, stronger than on head and pronotum, interspaces 2–3 times as wide as punctures, four rows of systematic punctures moderately distinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with mesal bulge.

Femora (Fig. 69): Pubescence present on proximal half of profemur, on less than proximal half of mesofemur, hairlines straight, on metafemur pubescence restricted to a narrow anterior rim and to proximal region adjacent to trochanter.

Abdomen: Ventrite 5 with apical emargination, ca. 15 µm deep.

Aedeagus (Fig. 130): Length: 0.24–0.26 mm. Phallobase about as long as parameres, as long as wide; margins abruptly bending to distinct long manubrium; border between pigmented and unpigmented portion of ventral face almost reaching manubrium. Parameres widest at midlength, evenly narrowing towards base and apex; apex bluntly rounded, not inclining; dorsal face extending to midlength of phallobase. Median lobe narrow, lateral margins almost parallel-sided, apex bluntly rounded; styli present; corona in subapical position; basal apophyses moderately long, reaching almost midlength of phallobase.

ECOLOGY: The specimens were found in streams between 120 and 200 m a.s.l., together with *A. anatinus*, *A. boukali*, *A. obscuratus*, and *A. obsoletus*.

DISTRIBUTION (Fig. 154): India (Kerala).

ETYMOLOGY: The name refers to the village of Kallar (Kerala, India), where the species was collected. Proper noun in apposition.

Agraphydrus kempii (ORCHYMONT, 1922)

Helochares (s.str.) *kempii* ORCHYMONT 1922: 626.

Helochares (*Agraphydrus*) *kempii* ORCHYMONT: ORCHYMONT 1928: 108.

Agraphydrus (s.str.) *kempii* (ORCHYMONT): HANSEN 1999: 156; HANSEN 2004: 49; FIKÁČEK et al. 2015: 60.

TYPE LOCALITY: India, Arunachal Pradesh, East Siang District, Yembung.

TYPE MATERIAL: **Holotype** (not examined): According to ORCHYMONT (1922) deposited in the “Indian Museum, No. 4148/19” (IMK, not accessible at present.) with the following sampling data: “Yembung, 1100 ft., 19.I.1912, {leg. S.W.} Kemp, Abor Expedition”. **Paratype** (examined): 1 ♀ (ISNB): “Yambung \ 1100 ft. \ Abor Exp. \ 15–1.12. \ Kemp coll. \ bank \ of stream \ d’Orchymont \ {mounted on a yellow label: “Coll. R.I.Sc.N.B. \ Inde”} | A. d’Orchymont det. \ *Helochares* \ *kempii* \ Cotype | Para \ type {red label}.”. Antenna, maxillary and labial palpomeres are mounted separately below the dissected specimen.

According to ORCHYMONT (1922) a second paratype should exist: “Three specimens ... were secured at Yembung, on the banks of a stream, under stones”. This specimen could not be located.

ADDITIONAL MATERIAL EXAMINED:

I N D I A: **Uttarakhand**: 1 ex. (ISNB): Kumaon Division, West Almora Distr., “Knisch det. 1922 \ *pauculus* m. | Coll. A. Knisch \ Cotypus” {paratype of *H. pauculus*}; 1 ex. (ISNB): Kumaon Division, W-Almora, “*Helochares* \ Knisch det. 1922 \ *Hel...morphism* \ *pauculus* m. | Coll. A. Knisch \ Cotypus” {paratype of *H. pauculus*}; 7 exs. (NHM): Kumaon Div., “Haldwani Dist.” {Nainital Distr.}, leg. H.G. Champion; 3 exs. (NHM, NMW): Kumaon Div., W-Almora, leg. H.G. Champion; 2 exs. (NHM): Kumaon Div., Central Almora, leg. H.G. Champion; 1 ex. (NHM): Kumaon Div., Almora, Ranikhet, leg. H.G. Champion; 1 ex. (NHM): Garhwal Div., Haridwar Distr., Haridwar (town), Ganges, 2000 ft., leg. H.G. Champion; 3 exs. (NHM): Garhwal Div., Dehradun Distr., Lachiwala, leg. H.G. Champion; 1 ex. (NHM): Garhwal Div., Dehradun Distr., 2000 ft., VIII.1927, leg. H.G. Champion; 1 ♀ (NMW): Nainital, 1900 m a.s.l., 27.VI.1989, leg. R. Schuh; 2 ♂♂, 4 ♀♀ (NMW): Bageshwar Distr., Falda River, left tributary of Saryu River, at Falda (village), ca. 15 km N Bageshwar (town), 29°55'11"N 79°52'8"E, 1010 m a.s.l., ca. 5–10 m wide, partly with larger boulders, 14.XI.2006, leg. M.A. Jäch “20”; 3 exs. (NMW): Bageshwar Distr., streams near Goulna, ca. 11–13 km N Bageshwar, 29°54'44"N 79°50'1"E and 29°54'33"N 79°49'29"E, 1000–1020 m a.s.l., 14.XI.2006, leg. M.A. Jäch “21a+b”; 2 ♀♀ (NMW):

- Bageshwar Distr., Nagla (stream), above Kalligaid (village), ca. 8 km SE Bageshwar, 29°45'22"N 79°45'31"E, 1320 m a.s.l., ca. 0.5 m wide, flowing through pine forest, 14.XI.2006, leg. M.A. Jäch "22"; 2 exs. (NMW): Chamoli Distr., Pindar River, ca. 2 km W Nandkesri (village), ca. 5 km E Tharali (or Tharli, village), 30°02'20"N 79°33'1"E, 1250 m a.s.l., ca. 30 m wide, flowing through forested valley, with wide gravel bank, 12.XI.2006, leg. M.A. Jäch "14"; 1 ♂ (NMW): Chamoli Distr., Sun River, right tributary of Pindar River, ca. 4 km E Tharali (or Tharli), 30°03'42"N 79°31'11"E 1320 m a.s.l., ca. 5–8 m wide, flowing through deep shady gorge, 12.XI.2006, leg. M.A. Jäch "15"; 1 ♂ (NMW): Chamoli Distr., Kalia River, left tributary of Pindar River, at Simli (village), ca. 5 km E Karanprayag, 30°14'23"N 79°15'00"E, 836 m a.s.l., ca. 5–7 m wide, rather low discharge, flowing from steep slope, quite strongly impacted by human droppings, 12.XI.2006, leg. M.A. Jäch "12"; 1 ♂ (NMW): Chamoli Distr., Dhup (spring brook), SE Gwaldam (village), 29°59'58"N 79°33'48"E, 1940 m a.s.l., ca. 1 m wide, flowing through gorge with degraded forest (e.g. pine), with larger boulders, 12.XI.2006, leg. M.A. Jäch "17"; 1 ♂ (NMW): Dehradun Distr., Sukma River, right tributary of Ganga River, ca. 5 km S Raiwala (village) ca. 10 km N Haridwar (town), 30°03'23"N 78°12'54"E, ca. 340 m a.s.l., flowing in gravel bed of ca. 100 m width, with several furcations (up to 20 m wide), through degraded forest and populated areas, 9.XI.2006, leg. M.A. Jäch "4"; 15 exs. (NMW): Pauri Garhwal Distr., Gouri (stream), left tributary of Alaknanda River, ca. 2 km upstream from Thamdar (village, junction), along road to Marud (village), ca. 8 km NE Srinagar (town) 30°13'54"N 78°51'42"E, ca. 730 m a.s.l., ca. 2 m wide, flowing through steep gorge with cliffs and bushes, 11.XI.2006, leg. M.A. Jäch "8"; 1 ♂, 1 ♀ (NMW): Nainital Distr., Kalsa River, at Chanpi (village), ca. 6 km N Bhimtal (town), 29°22'22"N 79°34'43"E, 1230 m a.s.l., ca. 3–10 m wide, flowing through gravel bed (up to 30 m wide), partly with larger boulders, 16.XI.2006, leg. M.A. Jäch "27"; 1 ♂ (NMW): Tehri Garhwal Distr., Dahrad (stream), right tributary of Ganga River, at Gular (village), ca. 5 km W Byasi (village), 30°06'57"N 78°26'12"E, 450 m a.s.l., ca. 2–3 m wide, flowing through forested gorge, 10.XI.2006, leg. M.A. Jäch "7"; **Meghalaya:** 1 ♂ (NMW): West Garo Hills Distr., Nokrek NP, ca. 1100 m a.s.l., 25°29.6'N 90°19.5'E, 9.–17.V.1996, leg. E. Jendek & O. Šauša.
- N E P A L: Central Region:** 1 ♀ (NMW): Bagmati Zone, Sindhupalchowk Distr., Bahrabishe, 7.XI.1993, leg. S. Sharma "3"; 1 ♂, 4 ♀♀ (NMW): Bagmati Zone, N Kathmandu, Sun Kosi River at Lamosangu (village), 5.II.1981, leg. M.A. Jäch "N 5"; 3 ♂♂, 1 ♀ (MNS): Janakpur Zone, Ramechhap Distr., Khimti Khola near Shivalaya, 1800 m a.s.l., 5.V.1997, leg. W. Schawaller "505"; **Eastern Region:** 16 exs. (NMW): Koshi Zone, Sunsari Distr., Dharan, Sardu River, 12.II.1981, leg. M.A. Jäch "N10"; 4 exs. (NMW): Koshi Zone, Sunsari Distr., at Dharan, spring brooks of Sewuti River, 11.II.1981, leg. M.A. Jäch "N9"; 1 ♂ (MNS): Mechi Zone, Taplejung Distr., Yektin to Worebung Pang, 1500–1800 m a.s.l., cultural land, 21.IV.1988, leg. J. Martens & W. Schawaller "332"; **Far Western Region:** 1 ♂, 3 ♀♀ (NMW): Far Western Region, "Baetadi, Sera Kansan Gad", 7.XII.1993, leg. S. Sharma "41"; **Mid-Western Region:** 5 exs. (MNS): Bheri Zone, Surkhet Distr., NE Surkhet, collected at bank, 700–1200 m a.s.l., 27.V.1998, leg. W. Schawaller "554"; 2 ♂ (NMW): Rapti Zone, Pyuthan Distr., Devasthan, Arung Khola, 25.XII.1993, leg. S. Sharma "57"; **Western Region:** 6 exs. (MTD): Dhaulagiri Zone, Myagdi Distr., Dhaulagiri-Himal, Rahughat Khola (stream, tributary of Kali Gandaki River) Valley, Jhin (village), 28°25.34'N 83°30.73'E, 1500–1750 m a.s.l., 16.VI.1998, leg. O. Jäger; 1 ♀ (NMW): Gandaki Zone, Syangja Distr., Patalikhet, Andhi Khola, 860 m a.s.l., 4.I.1994, leg. S. Sharma "64"; 1 ♂ (NMW): Gandaki Zone, Palpa Distr., Ramdighat, Agah Khola, 490 m a.s.l., 5.I.1994, leg. S. Sharma "68"; 1 ♂ (NMW): Gandaki Zone, Palpa Distr., Ramdighat, Upha Khola, 5.I.1994, leg. S. Sharma "69"; 20 exs. (MTD, NMW): Gandaki Zone, Annapurna Mts., Marsyandi River Valley, stream near Ngadi (village), 1000 m a.s.l., 26.VIII.1995, leg. O. Jäger; 3 exs. (MTD, SEMC): Gandaki Zone, Gorka Distr., Annapurna Mts., Marsyandi River Valley, Pokhara – Pame, stream at Besi Sahar (municipality), 800 m a.s.l., 28.VIII.1995, leg. O. Jäger; 1 ♂ 1 ♀ (MTD, SEMC): Gandaki Zone, Gorka Distr., Annapurna Mts., Pokhara – Pame, 800 m a.s.l., 18.V.1996, leg. J. Schmidt & O. Jäger; 4 exs. (MTD): Gandaki Zone, Annapurna Mts., torrent, 2 km N Bahandanda, 26.VIII.1995, leg. O. Jäger; 8 exs. (MTD, NMW): Gandaki Zone, Annapurna, N Pokhara, Kali Khola (river), below Garland (village), 1000–1200 m a.s.l., 18.IV.1996, leg. O. Jäger; 1 ex. (MTD): Gandaki Zone, Kaski Distr., Annapurna, tributary of Madi Khola River near Kwinkal (ca. 10 km ENE Pokhara), ca. 28°13'55"N 84°5'16"E, ca. 750 m a.s.l., 15.V.1996, leg. O. Jäger; 6 exs. (MTD): Gandaki Zone, Lamjung Distr., Annapurna Mts., Madi Khola Valley below Khilang (village), 1000 m a.s.l., "Ufertümpel u. Zufluß" {pool at margin and tributary}, 14.V.1996, leg. O. Jäger; 1 ex. (MTD): Gandaki Zone, Lamjung Distr., Annapurna Mts., Madi Khola, "Ufertümpel an Wasserkraftstation {pool at hydropower station} Siklis", 1500 m a.s.l., 10.V.1996, leg. O. Jäger; 1 ex. (CSH): Gandaki Zone, Annapurna Conservation Area, Birethanti (village at Modi Khola River), 1100 m a.s.l., 28°19'04"N, 83°34'65"E, 20.IV.2000, leg. A. Skale; 1 ♀ (NMW): Lumbini Zone, Gulmi Distr., Panaghat, Chaldi River, 20.I.1994, leg. S. Sharma "S75"; 24 exs. (NMW): Dhaulagiri Zone, Baglung Distr., S Dhaulagiri Mts., 5 km W Baglung, 1000 m a.s.l., 7.V.2004, leg. J. Schmidt.
- B H U T A N:** 6 exs. (NMW): Sarpang Prov., Bhur Khola, 11 km NW of Sarpang, 26°55'23"N 90°23'51"E, ca. 350 m a.s.l., river ca. 30 m wide, gravel banks, furcations, 27.XI.2005, leg. M.A. Jäch "30"; 2 ♂♂ (NMW): Tsirang Prov., Neychey Chhu (river, left tributary of Puna Tsang Chhu), ca. 48 km SSE Wangdi Phodrang, 27°08'26"N

90°04'14"E, ca. 550 m a.s.l., ca. 5 m wide, fast flowing, through rocky gorge, 25.XI.2005, leg. M.A. Jäch "23"; 1 ♂, 1 ♀ (NMW): Tsirang Prov., NW of Damphu Town, 27°00'19"N 90°5'50"E, ca. 1220 m a.s.l., small stream, very steep, big boulders, river bed not well developed, flowing through forest, 25.XI.2005, leg. M.A. Jäch "24"; 27 exs. (NMW): Tsirang Prov., Nyara Chhu (river, right tributary of Puna Tsang Chhu), ca. 44 km SSE of Wangdi Phodrang, 27°10'22"N 90°3'48"E, ca. 550 m a.s.l., ca. 8 m wide, furcations, residual pools, fast flowing, through unforested valley, 25.XI.2005, leg. M.A. Jäch "22".

DIFFERENTIAL DIAGNOSIS: Belongs to species with shagreened clypeus and unicolored yellow maxillary palpomeres. Extension of clypeal microsculpture variable; specimens with almost complete shagreenation share dark colored pronotum and elytra with *A. connexus*, *A. obscuratus*, *A. bhutanensis* and similar aedeagus with *A. bhutanensis*; differ from all these species in deep black (in contrast to dark brown) pronotum and elytra. Similar to *A. reticuliceps* KOMAREK & HEBAUER, 2018 regarding deep black dorsal coloration, differing in larger eyes and aedeagus. Specimens with shagreenation restricted to anterior clypeal margin most similar to black specimens of *A. stagnalis*, differing in slightly larger size (*A. stagnalis*: 2.0–2.3 mm body length). Differs from of *A. communis*, *A. crassipenis*, *A. pauculus*, and *A. protentus* in deep black pronotum and elytra (lighter colored areas present in the other species). Shares distinctly inflated apex of parameres with *A. communis*, *A. setifer* KOMAREK & HEBAUER, 2018, *A. audax* KOMAREK & HEBAUER, 2018, *A. arduus* KOMAREK & HEBAUER, 2018, and *A. igneus* KOMAREK & HEBAUER, 2018. Aedeagus differs in strongly sigmoid margins of parameres from these species and moreover in shorter median lobe from *A. protentus* and *A. communis*.

DESCRIPTION: Total length: 2.2–2.6 mm; elytral width: 1.1–1.2 mm; E.I.: 1.3–1.4, P.I.: 2.1, elytra 2.9–3.2 times as long as pronotum. Habitus (Fig. 24) moderately broad, elytra parallel-sided, moderately convex.

Coloration: Labrum, clypeus and frons black, clypeus with weakly defined, dark yellow preocular patches, smaller than diameter of eye in most cases, rarely as wide as eye, in some individuals absent or reduced to indistinct yellow lateral margins; maxillary palpi unicolored yellow; pronotum and elytra deep black with narrow yellow lateral margins; ventrites black; femora dark brown at proximal portion, light brown distally, tibiae and tarsi yellow to light brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 3.2, lateral length ratio clypeus/eyes = 1.5; microreticulation present in anterior half, in rare cases microsculpture reduced to anterior fourth, rarely extended almost to frontoclypeal suture, always absent from variably sized postero-mesal area; ground punctures fine, shallow, interspaces 1–2 times as wide as punctures, systematic punctures distinct. Eyes large, very slightly protruding, oval. Antennae with nine antennomeres. Maxillary palpi (Fig. 100) slender, 1.2–1.3 times as long as pronotum in midline, 1.1 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.1–1.3, palpomere 4 almost symmetrical. Mentum with fine punctures grouped laterally, lateral portion with distinct rugose microsculpture.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral ground punctation as on head and pronotum, four rows of systematic punctures distinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with mesal bulge.

Femora (Fig. 70): Pubescence present on less than proximal 2/3 of profemur, on proximal 3/4 of meso- and metafemur; hairlines oblique on pro- and mesofemur, straight on metafemur.

Abdomen: Ventrite 5 with almost semicircular apical emargination.

Aedeagus (Fig. 131): Length: 0.31–0.32 mm. Phallobase slightly shorter than parameres, about as long as wide; bending obtusely angled towards triangular manubrium; border between pigmented and unpigmented portion of ventral face reaching midlength. Parameres wide; dorsal face distinctly sigmoid; apex bluntly rounded, inflated, ventral face distinctly shorter and wider

than dorsal face; basal portion reaching distal third of phallobase. Median lobe wide, widest at midlength, evenly narrowing to bluntly rounded apex, not reaching apex of parameres; corona slightly distal of midlength; basal apophyses short, very narrowly separated, reaching midlength of phallobase.

ECOLOGY: The specimens were found in rivers, streams, spring brooks, and ponds between 350 and 1940 m a.s.l. In Bhutan they were collected together with *A. bhutanensis*, *A. crassipennis*, *A. indicus*, and *A. stagnalis*; in Meghalaya together with *A. pygmaeus*; in Uttarakhand together with *A. communis*, *A. constrictus*, *A. indicus*, *A. pauculus*, *A. protentus*, *A. pygmaeus*, and *A. stagnalis*; in the Central Region of Nepal together with *A. pauculus*, *A. pullus*, and *A. stagnalis*; in the Midwestern Region together with *A. stagnalis*; in the Western Region together with *A. annapurnensis*, *A. ater*, *A. communis*, *A. constrictus*, *A. pauculus*, *A. protentus*, *A. pygmaeus*, and *A. stagnalis*.

DISTRIBUTION (Fig. 154): Bhutan: first record, India (Arunachal Pradesh, Meghalaya, Uttarakhand), Nepal (Central Region, Eastern Region, Western Region, Far Western Region).

Agraphydrus khasiensis sp.n.

TYPE LOCALITY: India, Meghalaya, Khasi Hills District, Shillong Peak, 25°32.8'N 91°52.5'E.

TYPE MATERIAL: **Holotype** ♂ (NMW): “NE-INDIA: Meghalaya \ Khasi Hills \ Shillong Peak | 25°32.8'N 91°52.5'E \ ca. 1850 m \ 4.–5.6.1996 \ leg. E. Jendek & O. Šauša”. **Paratypes**: **INDIA: Meghalaya**: 15 exs. (NMW): Khasi Hills Distr., Mawphlang Village, 2.–3.VI, 10.VI.1996, 25°26.7'N 91°45.2'E, 1700–1800 m a.s.l., leg. E. Jendek & O. Šauša “WGS 84”.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with strongly reduced metafemoral pubescence, apical infuscation of maxillary palpomere 4, and absence of apical emargination of ventrite 5, together with *A. nepalensis*, *A. sipekorum*, and most individuals of *A. indicus*. Shares brown pronotum and elytra, and presence of large reinforcing plate-like structure on median lobe with *A. sipekorum*; differs in strongly convex habitus, moderately coarse ground punctures, mesoventrite without carina, and aedeagus (presence of leaf-shaped structure, absence of lateral extension on parameres).

DESCRIPTION: Total length: 2.0 mm; elytral width: 1.1 mm; E.I.: 1.1, P.I.: 2.2, elytra 2.9 times as long as pronotum. Habitus (Fig. 25) broad, evenly oval, strongly convex.

Coloration: Labrum, clypeus, and frons black; clypeus with yellowish preocular patches, about as wide as eye; maxillary palpi yellow, palpomere 4 infuscated apically; pronotum dark brown with decreasing intensity of coloration to yellow lateral margins; elytra dark brown with yellow lateral margins; ventrites black; legs dark brown.

Head: Clypeus with weakly concave anterior margin, C.I.: 4.0, lateral length ratio clypeus/eyes = 2.0; microsculpture absent, ground punctures moderately fine, interspaces two times as wide as punctures, systematic punctures distinct. Eyes large, not protruding, circular. Antennae with eight antennomeres. Maxillary palpi moderately slender, as long as pronotum in midline, 0.8 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.2, palpomere 4 almost symmetrical. Mentum with large, shallowly impressed, widely spaced punctures.

Thorax: Pronotal punctures as on head, systematic punctures distinct. Elytral punctures slightly stronger than on head and pronotum, interspaces as wide as punctures, four rows of systematic punctures moderately distinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with mesal bulge.

Femora (Fig. 71): Pubescence present on proximal half of pro- and mesofemur, with slightly oblique hairlines, on metafemur pubescence restricted to a narrow anterior rim and to proximal region adjacent to trochanter.

Abdomen: Ventrite 5 without apical emargination.

Aedeagus (Fig. 132): Length 0.33 mm, Phallobase distinctly shorter than parameres, manubrium short, wide; border between pigmented and unpigmented portion of ventral face indistinct, extending to proximal third. Parameres with distinctly sigmoid margins; apex bluntly rounded, wide, inclining mesad; ventral face distinctly wider and shorter than dorsal face. Median lobe wide, widest at midlength; dorsal face abruptly narrowing subapically, apex bluntly rounded; ventral face shorter than dorsal face, with apical indentation; corona in subapical position; styli absent; large leaf-shaped structure present, arising from base of median lobe, with distinct apical emargination, basal apophyses long, bending laterad, extending into less than midlength of phallobase.

ECOLOGY: Unknown.

DISTRIBUTION (Fig. 152): India (Meghalaya).

ETYMOLOGY: The name refers to the Khasi Hills (India, Meghalaya) where the type specimens were collected.

Agraphyrus kodaguensis sp.n.

TYPE LOCALITY: India, Karnataka, Kodagu District, Tadiyendamol Mountain, ca. 12°14'N 75°36'E.

TYPE MATERIAL: **Holotype** 1 ♂ (NMW): "India, Karnataka, Coorg \ Mt. Tadiyendamol env. \ 1200–1400 m, 22.12.1998 \ 12°14'N 75°36'E \ leg. D. Boukal (13)"; the specimen was collected in a stream with stones, gravel, silt, mud, and leaf deposits, partly to fully shaded, draining disturbed primary forest and cardamom plantations. **Paratypes: INDIA: Karnataka:** 7 exs. (NMW): India, Karnataka, Kodagu Distr., Kakkabe env., 900–1200 m a.s.l., 12°15'N 75°35'E, larger stream, channel ca. 5 m wide, with large boulders, rocky bed with some stones and gravel in riffles, silt in pools, rather shaded, flowing through a small canyon in cultivated land, 25.XII.1998, leg. D. Boukal "21"; 13 exs. (NMW): same locality and collector, hygropetric (small stream flowing over a rock), some leaves and living plants, no algae, current rather fast, moderately shaded, draining disturbed forest, 22.XII.1998, "14"; 1 ♂ (NMW): same locality and collector, small stream, less than 0.5 m wide, a few cm deep, stones, silt in pools, stones, gravel, and pebbles in small riffles, with leaf deposits, rather shaded, draining cardamom plantations, and in a very small spring, ca. 2–3 m long before joining the stream, with very small discharge, gravel, silt, leaves, partly shaded, 23.XII.1998, leg. D. Boukal "17".

DIFFERENTIAL DIAGNOSIS: Shares nine-segmented antennae, unicolored palpomeres, absence of clypeal microsculpture, elytra with milky shine, very fine ground punctation, extended femoral pubescence, and emarginated ventrite 5 with *A. exedis*; differs in larger size (*A. exedis*: 2.4 mm body length) and in the aedeagus (parameres with stronger subapical lateral constriction).

DESCRIPTION: Total length: 2.7–3.1 mm; elytral width: 1.3–1.5 mm; E.I.: 1.4, P.I.: 2.1, elytra 3.1 times as long as pronotum. Habitus (Fig. 26) slender, elytra parallel-sided, moderately convex.

Coloration: Head, pronotum and elytra with a milky sheen; labrum, mesal third of clypeus and frons dark ferruginous to black, lateral thirds of clypeus with large, weakly defined, yellow, preocular areas; maxillary palpi unicolored yellow; pronotum largely dark ferruginous, with undefined, wide, yellow lateral and anterior margins; elytra dark ferruginous to black with narrow yellowish undefined lateral margins and slightly lighter colored posterior region; ventrites and legs dark brown to black.

Head: Clypeus with distinctly concave anterior margin, C.I.: 3.8, lateral length ratio clypeus/eyes = 1.6–1.7; microreticulation absent, ground punctures very fine, very shallow, interspaces 1–2 times as wide as punctures, systematic punctures indistinct. Eyes large, slightly protruding, slightly oblong. Antennae with nine antennomeres. Maxillary palpi slender, 1.0–1.1 times as long as pronotum in midline, as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.2–1.3, palpomere 4 asymmetrical. Mentum with very fine, very widely spaced punctures, situated on lateral portions, without microsculpture.

Thorax: Pronotal ground punctation very fine, almost obsolete, systematic punctures very indistinct. Elytral ground punctation very fine, more distinct than on pronotum, four rows of systematic punctures indistinct, strongly reduced in number, not reaching anterior margin. Mesoventrite with mesal bulge, abruptly sloping posteriorly.

Femora (Fig. 72): Pubescence present on proximal 2/3 of profemur with oblique hairline, on proximal 3/4 of meso- and metafemur with straight hairlines.

Abdomen: Ventrite 5 with very shallow apical emargination.

Aedeagus (Fig. 133): Length: 0.38–0.40 mm. Phallobase less than 1/3 as long as parameres, wider than long, abruptly bending to triangular manubrium; border between pigmented and unpigmented portion of ventral face indistinct, exceeding midlength of phallobase. Parameres with very strong subapical lateral and less strong mesal constriction; apex blunt, not inflated, inclining mesad; dorsal face extending to midlength of phallobase mesally; ventral face slightly shorter than dorsal face. Median lobe moderately wide, almost parallel-sided; apex blunt, not reaching apex of parameres; corona situated distal of midlength; basal apophyses long, reaching midlength of phallobase.

ECOLOGY: The specimens were found in streams and in a hygropetric habitat between 900 and 1400 m a.s.l., together with *A. boukali*, *A. obscuratus*, and *A. obsoletus*.

DISTRIBUTION (Fig. 153): India (Karnataka).

ETYMOLOGY: The name refers to the Kodagu District (India, Karnataka), where the type specimens were found.

Agraphydrus meghalayanus sp.n.

TYPE LOCALITY: India, Meghalaya, East Khasi Hills District, 11 km SW Cherrapunjee, Laitkynsew, 25°12'N 91°40'E.

TYPE MATERIAL: **Holotype** ♂ (NMP): "INDIA, Meghalaya state (6) \ E Khasi Hills District, 11 km SW Cherra- \ punjee, Laitkynsew, 21–24.iv. \ 2008, 25°12'N 91°40'E, 460 m \ Fikáček, Podskalská, Šípek lgt. | wet rock with algae/blue algae \ and fallen leaves at side of \ waterfall on small river surround \ by tropical forest, ca. 200 m \ upstream from living bridge". **Paratypes**: 2 ♂♂, 1 ♀ (NMP, NMW): same sampling data.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with completely shagreened clypeus, unicolored maxillary palpomeres, and dark pronotum and elytra, together with *A. bhutanensis*, *A. fortis*, *A. obscuratus*, and some specimens of *A. connexus* and *A. kempfi*. Differs from *A. fortis* in smaller size, finer ground punctures of pronotum and elytra, longer maxillary palpi (as long as pronotum in midline), length ratios of palpomeres 3 and 4, and presence of emargination on abdominal ventrite 5. Differs from *A. bhutanensis*, *A. obscuratus*, *A. connexus* and *A. kempfi* in distinctly broader habitus, wider pronotum, comparatively shorter maxillary palpomeres, and aedeagus (median lobe narrow, manubrium very indistinct).

DESCRIPTION: Total length: 2.3, elytral width: 1.3 mm; E.I.: 1.2, P.I.: 2.3, elytra 2.7 times as long as pronotum. Habitus (Fig. 27) broad, evenly oval, distinctly convex.

Coloration: Labrum yellow, clypeus dark yellow with undefined mesal infuscation, frons black; maxillary palpi yellow, infuscations absent; pronotum dark brown mesally, with rather wide, undefined yellow margins; elytra dark brown or black, with narrow yellow margins; ventrites black; legs light brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 4.4, lateral length ratio clypeus/eyes = 1.4; microreticulation present on entire clypeus; ground punctures very fine, very widely spaced, systematic punctures indistinct. Eyes large, not protruding, slightly oblong. Antennae with nine antennomeres. Maxillary palpi (Fig. 101) moderately slender, as long as pronotum in midline, 0.9 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.1, palpomere 4 almost symmetrical. Mentum with few, very fine, widely spaced punctures.

Thorax: Pronotal ground punctation as on head, systematic punctures indistinct. Elytral ground punctation stronger than on head and pronotum, four rows of systematic punctures indistinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with strong mesal bulge.

Femora (Fig. 73): Pubescence present on proximal 2/3 of femora, hairline oblique on profemur, straight on meso- and metafemur.

Abdomen: Ventrite 5 with almost semicircular apical emargination.

Aedeagus (Fig. 134): Length: 0.37–0.44 mm. Phallobase slightly shorter than parameres, about as long as wide, converging to small manubrium; border between pigmented and unpigmented portion of ventral face reaching manubrium. Parameres moderately wide; lateral margin sigmoid; mesal margin of dorsal face almost straight; apex wide, inflated, delicate; ventral face wider and shorter than dorsal face; basal portion reaching distal third of phallobase. Median lobe bottle-shaped, widest in basal third; apex not reaching apex of parameres; dorsal face deeply split; corona at midlength; styli present; basal apophyses short, very narrowly separated, reaching midlength of phallobase.

ECOLOGY: The specimens were found on a wet rock at the side of a waterfall at 460 m a.s.l.

DISTRIBUTION (Fig. 153): India (Meghalaya).

ETYMOLOGY: The name refers to the Indian state of Meghalaya, where the type specimens were collected.

Agraphydrus montanus MINOSHIMA, KOMAREK & ÔHARA, 2015

Agraphydrus montanus MINOSHIMA, KOMAREK & ÔHARA 2015: 54.

TYPE LOCALITY: India, Sikkim, West Sikkim District, Geyzing, Yuksom (town).

TYPE MATERIAL: **Holotype** ♂ (EUM): “(West Sikkim) \ Yuksam{Yuksom} (1780 m) \ 11.IX.1983 \ M. Sakai leg. | 272 | Collection \ of Ent. Lab. \ Ehime Univ. | HOLOTYPE \ Agraphydrus \ montanus sp. nov. \ Minoshima Y. des. 2014”.

DIFFERENTIAL DIAGNOSIS: Differs from all species with clypeal microsculpture in position of shagreenation along posterior margin anterior to frontoclypeal suture, in carinate mesoventrite, and in the combination of the following characters: habitus broad; dorsal color dark brown to black; ground punctures coarse; maxillary palpomeres stout, shorter than pronotum in midline.

DESCRIPTION: Total length 2.8 mm; elytral width: 1.5 mm; E.I.: 1.1, P.I.: 2.2, elytra 2.7 times as long as pronotum. Habitus (Fig. 28) broad, elytra parallel-sided, moderately convex.

Coloration: Labrum yellowish brown, clypeus blackish brown with yellow, triangular preocular patches as wide as diameter or eye; frons black; maxillary palpi unicolored yellow; pronotum

with large dark brown to black mesal area, reaching to level of eyes, with intensity of coloration decreasing toward wide yellow lateral margins; elytra dark brown to black mesally, lateral margins and posterior area yellowish brown; ventrites dark brown; legs lighter brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 4.1, lateral length ratio clypeus/eyes = 1.4; microsculpture present along lateral margins and very narrowly anterior to frontoclypeal suture, absent on anterior margin and clypeal disc; ground punctures coarse, distinctly impressed, interspaces 1–3 times as wide as punctures, systematic punctures indistinct. Eyes large, not protruding, oval. Antennae with nine antennomeres. Maxillary palpi (Fig. 102) stout, short, 0.9 times as long as pronotum in midline, 0.8 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.1, palpomere 4 almost symmetrical. Mentum with distinct punctures and indistinct flat wrinkles on lateral portions.

Thorax: Pronotal punctures coarse, slightly finer than on head, interspaces 2–3 times as wide as width of punctures, systematic punctures indistinct. Elytral ground punctation as on head, interspaces 1–2 times as wide as width of punctures, four rows of systematic punctures indistinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite flat with low short posteromedian carina, slightly widening posteriorly.

Femora (Fig. 74): Pubescence present on proximal 2/3 of femora, hairlines straight.

Abdomen: Ventrite 5 with semicircular excision, ca. 25 µm deep.

Aedeagus (Fig. 135): Length: 0.52 mm. Phallobase shorter than parameres, about as long as wide, bending obtusely angled to moderately long, narrow, manubrium; border between pigmented and unpigmented portion of ventral face indistinct, reaching midlength of phallobase. Parameres wide basally, narrowing apicad; margins with subapical constriction; apex asymmetrical, obliquely flattened, with sharply pointed lateral extension; dorsal face of basal portion weakly extending into phallobase; ventral face shorter than dorsal face. Median lobe almost parallel-sided, apex bluntly rounded with slight mesal dent, not reaching apex of parameres; corona small, situated in distal third; basal apophyses long, distinctly extending into phallobase.

ECOLOGY: Unknown.

DISTRIBUTION (Fig. 153): India (Sikkim).

Agraphydrus nanus sp.n.

TYPE LOCALITY: India, Kerala, Thiruvananthapuram District, Cardamom Hills, 50 km NW Pathanamthitta, Pambaiyar River, 9°25'N 77°05'E.

TYPE MATERIAL: **Holotype** ♂ (NMW): “INDIA: Kerala \ Cardamom Hills \ 50 km NW Pathanamthitta \ Pambaiyar river | 300 m, 6.–9.5.1994 \ 77°05'E 09°25'N \ at light \ leg. Z. Kejval”. **Paratypes**: **INDIA: Kerala**: 2 ♀♀ (NMW): same sampling data; 1 ♂ (CAS): Kottayam Distr., Koratty River, Erumeli (village), 35 miles E of Kottayam (municipal town), “350”, at light, 6.II.1965, leg. W.L. & J.G. Peters; **Karnataka**: 1 ♂ (ZMUC): Bangaluru Urban Distr., 18 km E Bangalore, Madras Rd., 2.X.1985, U.V., C.W., & L.B. O'Brian; **Madhya Pradesh**: 1 ♂ (NMW): Hoshangabad Distr., southern Madhya Pradesh, Denva River, Satpura Mountain Range, ca. 8 km SSE Matkuli, 22°34'29"N 78°29'43"E, ca. 400 m a.s.l., ca. 10–50 m wide, with several furcations, flowing through forested and cultivated land, substrate: gravel and boulders, margins with sand and mud, 28.II.2008, leg. M.A. Jäch, S. & P. Sharma “MP13”.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with strongly reduced metafemoral pubescence, presence of apical infuscation on maxillary palpomere 4, and presence of apical emargination on ventrite 5, together with *A. falcatus*, *A. glaber*, *A. kallar*, *A. obsoletus*, *A. pullus*, *A. punctulatus*, and most individuals of *A. indicus*. Shares yellow pronotum and elytra with *A. falcatus*; differs in smaller size (*A. falcatus*: 1.8–2.1 mm long), more slender habitus, eight-

segmented antennae, less wide extended mesofemoral pubescence, and aedeagus (styli absent, parameres acuminate, manubrium short and wide). Shares posteriorly widening elytra (in contrast to evenly oval elytra) and less extended mesofemoral pubescence with *A. glaber*; differs in yellow pronotum, carinate mesoventrite, and smaller size (*A. glaber*: 1.9 mm long). Shares dorsal coloration and similar aedeagus with *A. coomani*, differs in reduced metafemoral pubescence, smaller size, and aedeagus (narrower median lobe, apical position of corona, absence of styli).

DESCRIPTION: Total length: 1.4–1.5 mm; elytral width: 0.7–0.8 mm; E.I.: 1.3, P.I.: 2.0, elytra 2.9 times as long as pronotum. Habitus (Fig. 29) slender, elytra slightly widening posterior of midlength, strongly convex.

Coloration: Labrum, clypeus and frons black, clypeus with defined yellow preocular spots about as wide as diameter of eyes; maxillary palpi yellow, papomere 4 with distinct apical infuscation; pronotum yellow with small, indistinct, undefined, dark brown to black central infuscation, not as wide as interspace between eyes; elytra yellow with few, small, irregularly distributed, dark brown spots; ventrites dark brown to black; femora yellow with darkened proximal portion, tibiae yellow.

Head: Clypeus with weakly concave anterior margin, C.I.: 3.3, lateral length ratio clypeus/eyes = 1.7; microsculpture absent, ground punctures fine, interspaces three times as wide as punctures. Eyes large, but not protruding, slightly oblong, systematic punctures indistinct. Antennae with eight antennomeres. Maxillary palpi moderately slender, 0.9 times as long as pronotum in midline, 0.9 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.3, palpomere 4 symmetrical. Mentum with moderately coarse punctures, grouped laterally, wrinkles present laterally.

Thorax: Pronotal ground punctation as on head, systematic punctures indistinct. Elytral ground punctation as on pronotum, four rows of systematic punctures indistinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with very low indistinct median carina, absent in the paratype specimen from Karnataka.

Femora (Fig. 75): Pubescence present on proximal half of profemur with straight hairline, restricted to proximal fourth of mesofemur with concave hairline, confined to narrow anterior and proximal rim of metafemur.

Abdomen: Ventrite 5 weakly sclerotized apically, emargination present, ca. 7 µm deep.

Aedeagus (Fig. 136): Length: 0.24 mm. Phallobase distinctly shorter than parameres, not abruptly bending to short, wide manubrium. Parameres very slender; margins almost straight, slightly narrowing apicad; apex narrowly rounded, slightly inclining mesad; ventral face very slightly wider than dorsal face; basal portion not deeply reaching into phallobase. Median lobe very slender, evenly narrowing to acuminate apex, almost reaching apex of parameres, ventral face slightly wider, corona situated subapically; basal apophyses inclining laterad.

ECOLOGY: The specimens were found in a river and at light, between 300 and 400 m a.s.l.; at light they were collected together with *A. heinrichi*, *A. obscuratus*, and *A. rugosus*.

DISTRIBUTION (Fig. 152): India (Karnataka, Kerala, Madhya Pradesh).

ETYMOLOGY: The name *nanus* (Lat.) (= dwarf) refers to the very small body size. Noun in apposition.

Agraphydrus nepalensis sp.n.

TYPE LOCALITY: Nepal, Eastern Region, Koshi Zone, 2 km E Mangsingma.

TYPE MATERIAL: **Holotype** ♂ (MHNG): “E. Nepal Kosi \ 2 km E. Mangsingma \ 1900 m, 19.IV.84 \ Löbl – Smetana”; sifting of moss and leaves. **Paratypes**: **NEPAL: Eastern Region**: 1 ♀ (MHNG): same sampling data; 1 ♂ (MHNG): Koshi Zone, Induwa Kola Valley, sifting of moss and leaves near to a spring, 1750 m a.s.l., 14.IV.1984, leg. I. Löbl & A. Smetana; 1 ♂ (NMW): Koshi Zone, Induwa Kola Valley, 2000 m a.s.l., at bank of river, 16.IV.1984, leg. I. Löbl & A. Smetana; 1 ♂ (NME): Mechi Zone, Taplejung Distr., 24 km NE Taplejung, Sekathum, Camp, 27°32'10"N 87°48'29"E, 1550 m a.s.l., 6.V.2003, leg. A. Weigel.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with strongly reduced metafemoral pubescence, apical infuscation of maxillary palpomere 4, and absence of apical emargination of ventrite 5, together with *A. khasiensis*, *A. sipekorum*, and some individuals of *A. indicus*. Shares black pronotum with *A. indicus*, differs in slightly stouter maxillary palpomeres, slightly less distinct elytral systematic punctures, and in the aedeagus (absence of shield-shaped structure, presence of styli). Styli on median lobe also present in *A. boukali*, *A. obsoletus*, *A. kallar*, *A. falcatus*, and *A. coomani*; differs from these species in absence of emargination of abdominal ventrite 5, from *A. falcatus* and *A. coomani* moreover in black coloration of pronotum and elytra, from *A. coomani* additionally in reduced metafemoral pubescence.

DESCRIPTION: Total length: 1.6–1.8 mm; elytral width: 0.9–1.0 mm; E.I.: 1.2–1.3, P.I.: 2.2–2.4, elytra 3.0–3.1 times as long as pronotum. Habitus (Fig. 30) broad, evenly oval, strongly convex.

Coloration: Labrum, clypeus, and frons black; maxillary palpi yellow, palpomere 4 infuscated apically; pronotum black with indistinct narrow undefined rufous lateral margins; elytra black; ventrites black; legs dark brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 4.1, lateral length ratio clypeus/eyes = 1.9–2.1; microsculpture absent, ground punctures fine, strongly impressed, interspaces two times as wide as punctures, systematic punctures distinct. Eyes large, but not protruding, slightly oblong. Antennae with eight antennomeres. Maxillary palpi stout, 0.9 times as long as pronotum in midline, 0.8 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.2–1.3, palpomere 4 symmetrical. Mentum with fine punctures.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral ground punctation fine, stronger than on head and pronotum, interspaces about as wide as punctures, four rows of systematic punctures moderately distinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with mesal bulge.

Femora (Fig. 76): Pubescence present on proximal half of profemur, on less than proximal half of mesofemur, hairlines straight, on metafemur pubescence restricted to narrow anterior rim and to proximal region adjacent to trochanter.

Abdomen: Ventrite 5 without apical emargination.

Aedeagus (Fig. 137): Length: 0.29–0.30 mm. Phallobase distinctly shorter than parameres, about as long as wide; margins bending obtusely angled to short, moderately wide manubrium; border between pigmented and unpigmented portion of ventral face indistinct, extending to proximal third of phallobase. Parameres slender, with weakly sigmoidal lateral and mesal margins; apex bluntly rounded; basal portion with dorsal face distinctly extending into phallobase mesally; ventral face distinctly shorter than dorsal face. Median lobe narrow, with bluntly rounded apex; styli present; corona small, in distal third; basal apophyses short, distinctly extending into distal third of phallobase.

ECOLOGY: The specimens were found by sifting of moss and leaves in the vicinity of water bodies, and at a bank of a river, between 1550 and 2000 m a.s.l., together with *A. communis*, *A. indicus*, and *A. pygmaeus*.

DISTRIBUTION (Fig. 153): Nepal (Eastern Region).

ETYMOLOGY: The name refers to Nepal, where this species was collected.

Agraphydrus obscuratus sp.n.

TYPE LOCALITY: India, Kerala, Thiruvananthapuram District, Cardamom Hills, 50 km NW Pathanamthitta, near Pambaiyar River, ca. 9°25'N 77°5'E.

TYPE MATERIAL: **Holotype** ♂ (NMW): "S.INDIEN, Kerala \ Cardamom Hills, 300 m \ 50 km NW Pathanamthitta \ 77°05'E 09°25'N | Small Stream nr. \ Pambaiyar River \ 27.–29.12.1993 (12) \ leg. Boukal & Kejval". **Paratypes**: **INDIA: Kerala**: 54 exs. (NMW): same sampling data; 2 exs. (NMW): ca. 30 km NNE Thiruvananthapuram, Kallar, ca. 8°43'N 77°5'E, 150–200 m a.s.l., large stream along and at Ponmudi – Kallar road, with large boulders, gravel, silt, some leaf packs, fast flow, in riffles torrential, rather shaded, draining disturbed primary forest; collected on the shore (with silt and stones) near the water edge, 30.XII.1998, leg. D. Boukal (27); 1 ♂ (NMW): same geographical data, date and collector, but "29"; 1 ♂, 1 ♀ (NMW): same geographical data and collector, but 31.XII.1998, "31"; 1 ♂, 2 ♀♀ (NMW): ca. 30 km NNE Thiruvananthapuram, Kallar, ca. 8°43'N 77°7'E, ca. 200 m a.s.l., small stream, ca. 1 m wide, max. 10–20 cm deep, with stones, gravel, silt, algal growth, and leaf packs, slow to moderate current, fast flowing in a few riffles, partly shaded, draining secondary forest and cultivated land, slightly polluted (refuse), almost unshaded, 3.I.1999, leg. D. Boukal "41"; 2 ♂♂, 1 ♀ (NMW): 35 km NNE Thiruvananthapuram, Ponmudi, 8°46'N 77°7'E, 800 m a.s.l., 2.I.1999, leg. D. Boukal "39"; 1 ♀ (NMW): Cardamom Hills, 50 km NW Pathanamthitta, near Pambaiyar River, 9°25'N 77°5'E, 300 m a.s.l., at light, 6.–9.V.1994, leg. Z. Kejval; **Karnataka**: 6 exs. (NMW): Kodagu Distr., Tadiyendamol Mt. env., 12°14'N 75°36'E, 1200–1400 m a.s.l., in small and larger streams with large boulders, stones, gravel, silt, mud, and leaf deposits, partly to fully shaded, draining disturbed primary forest and cardamom plantations, some streams slightly polluted, (erosion ?), 22.XII.1998, leg. D. Boukal "13"; 2 ♂♂ (NMW): Kodagu Distr., Kakkabe env., 900–1200 m a.s.l., 12°15'N 75°35'E, in a stream, at base of a 20 m high waterfall above Palace Estate, in pools among boulders, partly shaded, draining forest plantations, 23.XII.1998, leg. D. Boukal "16"; **Maharashtra**: 1 ♀ (NMW): Satara Distr., Mahabaleshwar, 100 km SW Poona, 1300 m a.s.l., 16.IX.1991, leg. R. Schuh.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with completely shagreened clypeus and unicolored yellow maxillary palpomeres. Shares nine-segmented antennae, brown color of pronotum and elytra, small size, fine ground punctures and black clypeus with preocular patches with *A. connexus* and *A. bhutanensis*. Differs from *A. connexus* in absence of connecting band between median lobe and parameres, from *A. bhutanensis* in apex of parameres (not inflated) and length of median lobe almost reaching apex of parameres. Shares similar parameres (straight, apex not inflated and without lateral extension) with *A. reticuliceps*, differs in smaller size (*A. reticuliceps*: length 2.4–2.8 mm, width 1.1–1.3 mm), presence of microsculpture on frons, elytral coloration (*A. reticuliceps*: largely black), fine ground punctation of pronotum and elytra (*A. reticuliceps*: moderate), and aedeagus (parameres wider, *A. reticuliceps*: corona proximal of midlength of median lobe).

DESCRIPTION: Total length: 2.0–2.2 mm; elytral width: 0.9–1.0 mm; E.I.: 1.4, P.I.: 2.1, elytra 3.2–3.4 times as long as pronotum. Habitus (Fig. 31) slender, evenly oval, moderately convex.

Coloration: Labrum, clypeus and frons black, clypeus with distinct triangular preocular patches, about as wide as eye or smaller; maxillary palpi yellow, infuscations absent; pronotum dark brown mesally with intensity of coloration decreasing toward wide yellow lateral margins; elytra light brown, with wide, dark brown, lateral band in most individuals, rarely unicolored light or dark brown; ventrites dark brown; legs slightly lighter colored.

Head: Clypeus with weakly concave anterior margin, C.I.: 4,2, lateral length ratio clypeus/eyes = 1.5; clypeus entirely shagreened, frons less distinctly microreticulate in most individuals; ground punctures obsolete on clypeus, very fine on frons, interspaces 2–4 times as wide as punctures, systematic punctures distinct. Antennae with nine antennomeres. Eyes large, but not protruding, slightly oblong. Maxillary palpi (Fig. 103) slender, 1.1 times as long as pronotum in midline, as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.5, palpomere 4 almost

symmetrical. Mentum with few, very fine, very widely spaced punctures, grouped laterally, without microsculpture.

Thorax: Pronotal ground punctation fine, interspaces 3–4 times as wide as punctures, systematic punctures distinct. Elytral ground punctation as on pronotum or very slightly stronger, four rows of systematic punctures moderately distinct, mesal rows strongly reduced in number, not reaching anterior margin, additional subserrate row present along lateral margins. Mesoventrite with slight bulge.

Femora (Fig. 77): Pubescence present on proximal 2/3 of femora; hairline oblique on pro- and mesofemur, straight on metafemur.

Abdomen: Ventrite 5 with almost semicircular excision.

Aedeagus (Fig. 138): Length: 0.28–0.30 mm. Phallobase about as long as parameres, about as long as wide distally; margins almost straight, slightly conical, abruptly bending to long and wide manubrium; border between pigmented and unpigmented portion of ventral face indistinct, almost reaching manubrium. Parameres moderately wide; apex wide, almost symmetrical, not inclining mesad; dorsal face reaching distal third of phallobase; ventral face slightly wider than dorsal face. Median lobe bottle-shaped, moderately wide, widest in proximal third; apex bluntly rounded, almost reaching apex of parameres; dorsal face deeply split, surmounted by ventral face; styli absent; corona situated distal of midlength; basal apophyses moderately long, reaching distal third of phallobase.

ECOLOGY: The specimens were found in streams and at light between 300 and 1400 m a.s.l.; in Karnataka collected together with *A. kodaguensis*; in Kerala together with *A. boukali*, *A. cinnamum*, *A. heinrichi*, *A. kallari*, *A. nanus*, *A. obsoletus*, and *A. rugosus*.

DISTRIBUTION (Fig. 154): India (Karnataka, Kerala, Maharashtra).

ETYMOLOGY: The name *obscuratus* (Lat.) (= darkened) refers to the dark coloration of head, pronotum and elytra.

Agraphydrus obsoletus sp.n.

TYPE LOCALITY: India, Kerala, Idukki District, 10 km WSW Munnar, Kallar Valley, ca. 10°3'N 76°58'E.

TYPE MATERIAL: **Holotype** ♂ (NMW): "INDIA: Kerala, 5.1.1999 \ 10 km WSW Munnar, 1000 m \ Kallar Valley, 10°03'N 76°58'E \ leg. D. Boukal (45)". **Paratypes**: **INDIA: Kerala**: 8 exs. (NMW): same sampling data; 2 ♂♂, 1 ♀ (NMW): Idukki Distr., Cardamom Hills, 15 km SW Munnar, Kallar Valley, 10°2'N 76°58'E, in various streams, 6.–18.XII.1993, leg. D. Boukal & Z. Kejval "7"; 1 ♀ (NMW): Idukki Distr., 15 km SW Munnar, Kallar Valley, 10°2'N 76°58'E, 1000 m a.s.l., 6.–18.XII.1993, leg. D. Boukal & Z. Kejval "K1"; 9 exs. (NMW): Idukki Distr., Cardamom Hills, 10 km SW Kumily, Vallakadavu, 9°31'N 77°7'E, 1000 m a.s.l., in miniature pool at the bottom of rock, full of leaves, formed by a tiny stream, 24.XII.1993, leg. D. Boukal & Z. Kejval "10"; 6 exs. (NMW): Idukki Distr., 10 km W Munnar, Peschadu – Mangulam road, 10°04'N 76°58'E, 1100 m a.s.l. large stream, ca. 5 m wide, flowing through degraded forest with cardamom plantations, on steep slope, flowing on bedrock and roots of a shore tree in slow section with little gradient, almost completely shaded, moderately fast flowing, 6.1.1999, leg. D. Boukal "48"; 5 exs. (NMW): Idukki Distr., 10 km WSW Munnar, Kallar Valley, 10°03'N 76°58'E, 1100 m a.s.l., 7.1.1999, leg. D. Boukal "49"; 1 ♂ (NMW): Idukki Distr., 10 km WSW Munnar, Kallar Valley, 10°03'N 76°59'E, 1300 m a.s.l., small stream, ca. 1 m wide, large stones (moss), slower runs with stones, gravel, silt, leaf packs, moderately fast flowing, shading variable, draining disturbed forest, Hydrophilidae on sandy-muddy shore, 7.1.1999, leg. D. Boukal "51"; 2 ♂♂ (NMW): Idukki Distr., 10 km WSW Munnar, Kallar Valley, 10°03'N 76°59'E, 1200 m a.s.l., large stream, ca. 5 m wide, shallow at examined site, with boulders and large stones, bed with stones, gravel, silt, leaves, moderately to slowly flowing, rather unshaded, draining degraded forest with cardamom plantations, 8.1.1999, leg. D. Boukal "52"; 5 exs. (NMW): Thiruvananthapuram Distr., Cardamom Hills, 50 km NW Pathanamthitta, large stream near Pambaiyar River, 9°25'N 77°5'E, 300 m a.s.l., 27.–29.XII.1993, leg. Z. Kejval & D. Boukal "12"; 29 exs. (NMW): same sampling data, but "small stream near Pambaiyar river"; 4 exs. (NMW):

same sampling data, but “hygropetric near Pambaiyar river”; 2 exs. (NMW): same sampling data, but “left tributary of Pambaiyar river”; 1 ♂, 2 ♀♀ (NMW): Thiruvananthapuram Distr., ca. 30 km NNE Thiruvananthapuram, Kallar, Ponmudi – Kallar road, ca. 8°43'N 77°5'E, 150–200 m a.s.l., hygropetric on wet granite block with few leaves and algal growth, 30.XII.1998, leg. D. Boukal (28); 1 ♂ (NMW): same sampling data, but 31.XII.1998, leg. D. Boukal “31”; 1 ♀ (NMW): Thiruvananthapuram Distr., 36 km NNE Thiruvananthapuram, Ponmudi, 8°46'N 77°7'E, 300 m a.s.l., 2.I.1999, leg. D. Boukal “40”; 2 exs. (NMW): Thiruvananthapuram Distr., ca. 30 km NNE Thiruvananthapuram, Kallar, ca. 8°43'N 77°7'E, ca. 200 m a.s.l., small stream, ca. 1 m wide, max. 10–20 cm deep, with stones, gravel, silt, algal growth, and leaf packs, slow to moderate current, fast in a few riffles, partly shaded, draining secondary forest and cultivated land, slightly polluted (refuse), almost unshaded, 3.I.1999, leg. D. Boukal “41”; **Karnataka**: 1 ♂ (NMW): Kodagu Distr., Kakkabe env., 900–1200 m a.s.l., 12°15'N 75°35'E, larger stream, channel ca. 5 m wide, with large boulders, rocky bed with some stones and gravel in riffles, silt in pools, rather shaded, flowing through a small canyon in cultivated land, 21.–25.XII.1998, leg. D. Boukal “21”; **Tamil Nadu**: 1 ♀ (NMW): Nilgiris Distr., Nilgiri Hills, Kotagiri env., Honnattii, 11°25'N 76°55'E, 1500 m a.s.l., stream, ca. 1–2 m wide, runs ca. 10 cm deep, steep, boulders, pools, substrate (large stones and pebbles) somewhat unstable, leaf packs and decaying plants, moss on a few large stones, rather fast flowing, rather shaded (rich shore vegetation), draining tea plantations and remnants of disturbed primary forest, slightly polluted, 19.I.1999, leg. D. Boukal “75”; 1 ♀ (NMW): Salem Distr., Shevaroy Hills, 5 km SE Cauvery Peak, 11°48'N 78°16'E, 1100 m a.s.l., in streamlet and hygropetric film of water running over a rock and tiny, partly isolated pools on top and at base of the rock, some dead leaves, at most a few cm deep, rather shaded, draining degraded forest, shrubs, slightly polluted, 26.I.1999, D. Boukal “89”.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with strongly reduced metafemoral pubescence, presence of apical infuscation on maxillary palpomere 4, and presence of apical emargination of ventrite 5, together with *A. falcatus*, *A. glaber*, *A. kallar*, *A. nanus*, *A. pullus*, *A. punctulatus*, and some individuals of *A. indicus*. Differs from *A. falcatus* and *A. nanus* in black pronotum; from *A. glaber*, *A. nanus* and *A. punctulatus* in wider extension of mesofemoral pubescence; from *A. indicus* in the aedeagus (styli present). Shares similar aedeagus with *A. nepalensis* and *A. punctulatus* (parameres almost straight, styli present); differs from *A. nepalensis* in presence of emargination on ventrite 5. Differs from all species in ground punctation (obsolete on head, obsolete to very fine on pronotum).

DESCRIPTION: Total length: 1.4–1.8 mm; elytral width: 0.7–0.9 mm; E.I.: 1.3, P.I.: 2.2, elytra 3.0–3.1 times as long as pronotum. Habitus (Fig. 32) broad, evenly oval, strongly convex.

Coloration: Labrum, clypeus, and frons black; clypeus unicolored or with very indistinct narrow red lateral margins in some individuals; maxillary palpi yellow, palpomere 4 infuscated apically; pronotum black with weakly defined, narrow yellow lateral margins; elytra unicolored black or dark brown with black areas, in most cases posterior half and/or lateral margins paler; ventrites black; legs dark brown.

Head: Clypeus with weakly concave anterior margin, C.I.: 4.6, lateral length ratio clypeus/eyes = 1.3–1.4; microsculpture absent, obsolete punctured, systematic punctures distinct. Eyes large, not protruding, slightly oblong. Antennae with eight antennomeres. Maxillary palpi moderately slender, 1.0–1.1 times as long as pronotum in midline, 0.9 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.3, palpomere 4 almost symmetrical. Mentum with very fine punctures.

Thorax: Pronotal ground punctation obsolete to very fine, systematic punctures distinct. Elytral ground punctation very fine, slightly stronger than on pronotum, widely spaced, four rows of systematic punctures moderately distinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with mesal bulge.

Femora (Fig. 78): Pubescence present on proximal half of profemur, and on less than proximal half of mesofemur; hairlines straight; on metafemur pubescence restricted to narrow anterior rim and to proximal region adjacent to trochanter.

Abdomen: Ventrite 5 with apical emargination.

Aedeagus (Fig. 139): Length: 0.26–0.29 mm. Phallobase distinctly shorter than parameres, about as long as wide, abruptly bending to long manubrium; border between pigmented and unpigmented portion of ventral face reaching midlength of phallobase. Parameres moderately wide, with almost straight margins; apex broadly rounded, not inclining; basal portion of dorsal face extending to midlength of phallobase mesally. Median lobe moderately narrow; lateral margins evenly converging to bluntly rounded apex; styli present; corona in subapical position; basal apophyses long, widely separated, extending to midlength of phallobase.

ECOLOGY: The specimens were found in streams and hygropetric habitats between 300 and 1500 m a.s.l.; in Karnataka they were collected together with *A. boukali* and *A. kodaguensis*; in Kerala together with *A. boukali*, *A. cinnamum*, *A. falcatus*, *A. gilvus*, *A. heinrichi*, *A. inflatus*, *A. kallar*, *A. obscuratus*, and *A. rostratus*; in Tamil Nadu together with *A. rostratus* and *A. rugosus*.

DISTRIBUTION (Fig. 154): India (Kerala, Karnataka, Tamil Nadu).

ETYMOLOGY: The name *obsoletus* (Lat.) (= obsolete) refers to the obsolete ground punctation of the head.

Agraphydrus pauculus (KNISCH, 1924)

Helochares (*Helocharimorphus*) *pauculus* KNISCH 1924: 36.

Helochares (*Agraphydrus*) *pauculus* KNISCH: ORCHYMONT 1928: 108.

Agraphydrus pauculus KNISCH: CHIESA 1967: 275 (incorrect identification).

Agraphydrus pauculus (KNISCH): HANSEN 1991: 148.

Agraphydrus (s.str.) *pauculus* (KNISCH): HANSEN 1999: 157; HANSEN 2004: 49; FIKÁČEK et al. 2015: 60.

TYPE LOCALITY: India, Uttarakhand, Kumaon Division, West Almora.

TYPE MATERIAL: **Lectotype** ♂ (NHM), by present designation: “W-Almora \ Kumaon \ India. H.G.C. | TYPE \ H.T. {round, red bordered label} | Knisch det. 1922 \ *Helochares* \ (*Helocharimor-* \ *phus*) *Championi* m. | *Helochares* \ Knisch det. 1922 \ *pauculus* m. | G.C. Champion Brit. Mus. 1925–42 | det. Knisch, W.E.Z. 1924 | LECTOTYPUS \ *Agraphydrus pauculus* (Knisch, 1924) \ des. Komarek 2018”. **Paralectotypes**: 3 exs. (NHM): “W-Almora \ Kumaon \ India. H.G.C. | *Helochares* \ *pauculus* \ Knisch | G.C. Champion. Brit. Mus. 1925–42 | *Helochares* \ Knisch det. 1922 \ *pauculus* m.” (one of these specimens is mounted together with the lectotype on the same card); 3 exs. (ISNB, NMW): same sampling data, mounted on a yellow label: “Coll. R.I.Sc.N.B / Inde / coll. d’Orchym.”.

ADDITIONAL MATERIAL EXAMINED:

I N D I A: Uttarakhand: 16 exs. (NHM, ZMUC): Kumaon Division, W-Almora, Kumaon, leg. H.G. Champion; 2 exs. (NHM): Kumaon Division, Sarju Valley, 1000 ft., leg. H.G. Champion; 1 ♂ (NMW): Chamoli Distr., Nandakini River, below Sedoli (village), ca. 10 km E Nandaprayag, 30°15'50"N 79°26'32"E, 1270 m a.s.l., two furcations (each ca. 10 m wide), rather fast flowing through wide valley, partly with large boulders, 12.XI.2006, leg. M.A. Jäch “11”; 1 ♂ (NMW): Chamoli Distr., Bilkhuri (spring brook), at Taal (village), between Tharali (or Tharli) and Gwaldam, 30°01'04"N 79°31'56"E, 1930 m a.s.l., ca. 1 m wide, flowing through densely forested gorge, 12.XI.2006, leg. M.A. Jäch “16”; 1 ♂ (NMW): Nainital Distr., Kalsa River, at Chanpi (village), ca. 6 km N Bhimtal (town), 29°22'22"N 79°34'43"E, 1230 m a.s.l., ca. 3–10 m wide, flowing through gravel bed (up to 30 m wide), partly with larger boulders, 16.XI.2006, leg. M.A. Jäch “27”.

N E P A L: Central Region: 1 ♂ (NMW): Bagmati Zone, N Kathmandu, Sun Kosi River at Lamosangu (village), 5.II.1981, leg. M.A. Jäch “N5”; 2 exs. (NMW): Bagmati Zone, Sindhupalchok Distr., Tatobani, unshadowed small spring brook, flowing between rice terraces, 28.II.1981, leg. M.A. Jäch “N30”; 4 ♀♀ (NMW): Bagmati Zone, Sindhupalchok Distr., border to Tibet, Sun Kosi River at Tatobani, very cold, wide, deep, 27°56'37.9"N 85°56'56.8"E, 27.II.1981, leg. M.A. Jäch “N29”; **Eastern Region:** 1 ♂ (MHNG): Koshi Zone, Arun valley, Num, 1050 m a.s.l., 20.IV.1984, leg. I. Löbl & A. Smetana; **Western Region:** 3 ♂♂, 4 ♀♀ (MTD, NMW): Gandaki Zone, Kaski Distr., Annapurna, tributary of Madi Khola River near Kwinkal (ca. 10 km ENE Pokhara), ca. 28°13'55"N 84°5'16"E, ca. 750 m a.s.l., 15.V.1996, leg. O. Jäger; 3 ♂♂ (MTD, NMW): Gandaki Zone, Annapurna, N Pokhara, Kali Khola, below Garlang (village), 1000–1200 m a.s.l., 18.IV.1996, leg. O. Jäger; 5 exs. (CSH, NMW): Gandaki Zone, Annapurna Conservation Area, Birethanti (village at Modi Khola River), 1100 m a.s.l., 28°19'04"N, 83°34'65"E, 20.IV.2000, leg. A. Skale; 1 ♀ (CSH): Gandaki Zone, Annapurna,

Tikkedhunga (village), 28°20'93"N 83°44'53"E, 1500 m a.s.l., 20.IV.2000, leg. A. Weigel; 4 exs. (NME): Gandaki Zone, Pokhara, southern margin of Lake Phewa, stream, sifting, 800–900 m a.s.l., 8.V.2001, leg. G. Hirthe.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with microsculpture present along anterior margin of clypeus and unicolored yellow maxillary palpomeres, together with *A. communis*, *A. crassipennis*, *A. protentus*, *A. stagnalis*, and some specimens of *A. kempfi*. Differs from these species in length and shape of maxillary palpomeres (1.1 times as long as pronotum in midline in contrast to 1.2 times; ratio palpomere 4:3 = 1.1 in contrast to 1.3–1.4 in the other species) and in the aedeagus (median lobe almost globular, parameres very short with narrow apex).

DESCRIPTION: Total length: 2.3–2.5 mm; elytral width: 1.1–1.2 mm; E.I.: 1.3, P.I.: 2.1, elytra 3.0 times as long as pronotum. Habitus (Fig. 33) moderately broad, elytra parallel-sided, moderately convex.

Coloration: Labrum, clypeus and frons black, clypeus with very narrow yellow preocular patches smaller than diameter of eye; maxillary palpi unicolored yellow; pronotum black with narrow yellow lateral margins; elytra dark brown with almost black sublateral band widening anteriorly, or largely black with undefined dark brown areas; ventrites black; femora dark brown at proximal pubescent part, light brown at distal glabrous part; tibiae and tarsi light brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 3.8, lateral length ratio clypeus/eyes = 1.7; microreticulation present on anterior half, in rare cases restricted to anterior and lateral margins, ground punctures fine, distinctly impressed, interspaces 1–2 times as wide as punctures, systematic punctures distinct. Eyes large, but not protruding, slightly oblong. Antennae with nine antennomeres. Maxillary palpi (Fig. 104) slender, 1.1–1.3 times as long as pronotum in midline, as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.1–1.2, palpomere 4 almost symmetrical. Mentum with punctures grouped laterally, lateral portion with distinct rugose microsculpture.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral ground punctation as on pronotum, four rows of systematic punctures distinct, mesal rows reduced in number with few punctures present in anterior half, not reaching anterior margin. Mesoventrite with strong mesal bulge.

Femora (Fig. 79): Pubescence present on proximal half of profemur, on proximal 2/3 of meso- and metafemur, hairlines slightly oblique on pro- and mesofemur, straight on metafemur.

Abdomen: Ventrite 5 with flat apical emargination, 12 µm deep.

Aedeagus (Fig. 140): Length: 0.33–0.37. Phallobase as long as parameres, about as long as wide, abruptly bending to long, spine-like manubrium; border between pigmented and unpigmented portion of ventral face almost reaching manubrium. Parameres stout, slightly wider basally than apically; apex asymmetrical; ventral face distinctly shorter than dorsal face; basal portion delicate, weakly extending into phallobase. Median lobe very wide, almost spheroidal, delicate; apex broadly rounded, not reaching apex of parameres; corona in subapical position; basal apophyses long, bending laterad, extending to midlength of phallobase.

ECOLOGY: The specimens were found in rivers, streams and spring brooks between 500 and 1930 m a.s.l.; in Uttarakhand they were collected together with *A. communis*, *A. constrictus*, *A. indicus*, *A. kempfi*, *A. pygmaeus*, and *A. stagnalis*; in the Western Region of Nepal together with *A. annapurnensis*, *A. ater*, *A. communis*, *A. kempfi*, *A. pygmaeus*, and *A. stagnalis*.

DISTRIBUTION (Fig. 154): [China (Tibet)], India (Uttarakhand), Nepal (Central Region, Eastern Region, Western Region).

In Sindhupalchok District (Nepal, Central Region, Bagmati Zone) the Sun Kosi River forms the border between Nepal and China (Tibet) over a stretch of about seven kilometers. Therefore, specimens collected in 1981 by M.A. Jäch in the Sun Kosi River at Tatobani (27°56'37.9"N 85°56'56.8"E, "N29") cannot be unambiguously assigned to Nepal or to China. Although all these specimens are here listed under Nepal, it must be assumed that this species occurs also in Tibet.

CHIESA (1967) recorded "*Agraphilydrus pauculus* KNISCH" from Afghanistan (Nuristan, Bashgul Valley, 1200 m a.s.l., 15.IV.1953, 20.IV.1953, leg. J. Klapperich). Although *Agraphilydrus* KUWERT, 1888 is a synonym of *Methydrus* REY, 1885 (now a subgenus of *Enochrus* THOMSON, 1859), these specimens indeed belong to *Agraphydrus*. The two specimens deposited in the HHNM do, however, not belong to *A. pauculus*. One of them is a female, the other one lacks the abdomen. Therefore they could not be identified. They are the only specimens of *Agraphydrus* known from Afghanistan.

Agraphydrus protentus sp.n.

TYPE LOCALITY: India, Uttarakhand, Nainital.

TYPE MATERIAL: **Holotype** ♂ (NMW): "India: Uttar Prad. {esh} \ Nainital 1900 m \ 27.6.1989 | leg. R. Schuh".
Paratypes: INDIA: Uttarakhand: 3 ♀♀ (NMW): same sampling data. **NEPAL: Western Region:** 3 ♂♂, 2 ♀♀ (MTD, NMW): Gandaki Zone, Siklis (villages), Annapurna Mts., torrent, 2000 m a.s.l., 3.VIII.1995, leg. O. Jäger 1995; 1 ♀ (MTD): Gandaki Zone, Siklis (villages), Annapurna Mts., "kleiner Wiesenbach" (= small stream flowing through meadow), 2000 m a.s.l., 2.VIII.1995, leg. O. Jäger 1995; 1 ♀ (MTD): Gandaki Zone, Annapurna Mts., torrent, 2 km N Bahandanda, 26.VIII.1995, leg. O. Jäger; 1 ♂ (MTD): Dhaulagiri Zone, Myagdi Distr., Annapurna Mts., Shikha (village), between Tatopani and Ghorepani, ca. 2000 m a.s.l., 14.VI.1993, leg. J. Schmidt; 5 exs. (MTD, NMW): Dhaulagiri Zone, Myagdi Distr., Dhaulagiri-Himal, Rahughat Khola (stream, tributary of Kali Gandaki River) Valley, Jhin (village), 28°25.34'N 83°30.73'E, 1500–1750 m a.s.l., 16.VI.1998, leg. O. Jäger.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with microsculpture present along anterior margin of clypeus and unicolored yellow maxillary palpomeres, together with *A. communis*, *A. crassipenis*, *A. pauculus*, *A. stagnalis*, and some specimens of *A. kempi*. Differs from *A. kempi* in narrow rim of shagreenation on anterior clypeal margin (largely extended on anterior third or half of clypeus in *A. kempi*), and from all species in the aedeagus (strong lateral extension on apex of parameres).

DESCRIPTION: Total length: 2.3–2.6 mm, elytral width: 1.2–1.3 mm, E.I.: 1.4–1.5, P.I.: 2.1, elytra 3.6 times as long as pronotum. Habitus (Fig. 34) slender, evenly oval, moderately convex.

Coloration: Labrum light or dark brown, clypeus black with defined yellowish brown triangulate preocular patches, about as large as diameter of eye; frons black; maxillary palpi unicolored yellow; pronotum black with narrow yellow lateral and anterior margins; elytra black with light brown brighter areas mainly posteriorly, or dark brown with almost black sublateral band in some specimens; legs light brown; ventrites dark brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 3.4, lateral length ratio clypeus/eyes = 1.5, ground punctation fine, interspaces two times as wide as punctures, clypeus with shagreenation on lateral margins and narrowly on anterior margin, systematic punctures distinct. Eyes large, not protruding, slightly oblong. Antennae with nine antennomeres. Maxillary palpi slender, 1.2 times as long as pronotum in midline, as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.4, palpomere 4 slightly asymmetrical with biconvex margins. Mentum with fine, widely spaced punctures, indistinct wrinkles present laterally.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral ground punctation as on head and pronotum, four subserial rows of coarser punctures moderately

distinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with distinct bulge.

Femora (Fig. 80): Pubescence present on proximal 2/3 of profemur, on proximal 4/5 of meso- and metafemur; hairlines rounded.

Abdomen: Ventrite 5 with shallow apical emargination.

Aedeagus (Fig. 141): Length: 0.37 mm. Phallobase shorter than parameres, about as long as wide, bending obtusely angled to moderately long, narrow manubrium; border between pigmented and unpigmented portion of ventral face reaching midlength. Parameres wide at base, lateral margin with strong subapical constriction; apex with large, blunt, lateral projection; mesal margin almost straight; basal portion reaching distal third of phallobase. Median lobe bottle-shaped, widest in basal third; apex bluntly rounded, not reaching apex of parameres, corona situated at midlength; basal apophyses very short, weakly separated, extending to midlength of phallobase.

ECOLOGY: The specimens were found in streams and torrents between 1500 and 2000 m a.s.l., in Uttarakhand they were collected together with *A. kempfi*, in Nepal together with *A. communis* and *A. kempfi*.

DISTRIBUTION (Fig. 154): India (Uttarakhand), Nepal (Western Region).

ETYMOLOGY: The name *protentus* (Lat., past participle derived from *protendere*) (= outstretched) refers to the shape of the apex of the parameres.

Agraphydrus pullus sp.n.

TYPE LOCALITY: Nepal, Eastern Region, Koshi Zone, Sunsari District, Dharan (city) environment.

TYPE MATERIAL: **Holotype** ♂ (NMW): “NEPAL \ 12.2. {19}81 N10 {handwritten} \ Dahrán {sic!} - Umg. \ leg. M. Jäch”; the specimen was collected near Dharan, in the gravel along the bank of Sardu River. Antennae missing.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with strongly reduced metafemoral pubescence, presence of apical infuscation on maxillary palpomere 4, and presence of apical emargination on ventrite 5, together with *A. falcatus*, *A. glaber*, *A. kallar*, *A. nanus*, *A. obsoletus*, *A. punctulatus*, and some individuals of *A. indicus*. Differs in black pronotum from *A. nanus* and *A. falcatus*, in distinctly wider extension of mesofemoral pubescence from *A. nanus*, *A. glaber* and *A. punctulatus*; in presence of fine, distinct ground punctation of head and pronotum from *A. obsoletus*. Differs from all other species of *Agraphydrus* in the aedeagus (length of aedeagus = 0.48 mm in contrast to 0.24–0.34 mm in other species mentioned, basal lobe large, 2.5 times as long as parameres, parameres distinctly sigmoid, embracing median lobe).

DESCRIPTION: Total length: 2.1 mm; elytral width: 1.0 mm; E.I.: 1.4, P.I.: 2.3, elytra 3.4 times as long as pronotum. Habitus (Fig. 35) slender, evenly oval, moderately convex.

Coloration: Labrum, clypeus and frons black, clypeus with very narrow indistinct red lateral margins; maxillary palpomeres yellow, palpomere 4 infuscated apically; pronotum black with narrow yellow lateral margins; elytra black; ventrites black; legs dark brown to black.

Head: Clypeus with distinctly concave anterior margin, C.I.: 4.1, lateral length ratio clypeus/eyes = 1.7–1.9; microsculpture absent, one or two indistinct wrinkles present along lateral margin in some cases, visible at 100 × magnification, ground punctures fine, shallow, interspaces 2–3 times as wide as punctures, systematic ground punctation on clypeus distinct. Eyes moderately large, not protruding, slightly oblong. Maxillary palpi slender, 1.2 times as long as pronotum in

midline, as long as maximum width of clypeus, length ratio of palpomeres $4:3 = 1.2$, palpomere 4 almost symmetrical. Mentum with fine punctures, grouped laterally, without microsculpture.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral ground punctation as on head and pronotum, four rows of systematic punctures indistinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with strong bulge.

Femora (Fig. 81): Pubescence present on proximal half of pro- and mesofemur with oblique hairlines, pubescence restricted to anterior margin and to small proximal area on metafemur.

Abdomen: Ventrite 5 with shallow apical emargination, ca. 10 μm deep.

Aedeagus (Fig. 142): Length: 0.48 mm. Phallobase 2.5 times as long as parameres and distinctly wider, bending obtusely angled towards wide and long manubrium; border between pigmented and unpigmented portion of ventral face extending to distal third of manubrium. Parameres forceps-shaped with distinctly sigmoid margins; apex distinctly bending mesad, embracing median lobe, base not extending into phallobase. Median lobe slender, evenly converging to apex, not reaching apex of parameres; corona situated basally; styli absent; basal apophyses very long, slender, slightly directed laterad, very weakly extending into phallobase.

ECOLOGY: The specimen was found in the gravel along the bank of a larger river, together with *A. crassipenis*, *A. kempi*, and *A. stagnalis*.

DISTRIBUTION (Fig. 154): Nepal (Eastern Region).

ETYMOLOGY: The name *pullus* (Lat.) (= dark colored) refers to the dark dorsal coloration.

Agraphydrus punctulatus sp.n.

TYPE LOCALITY: India, Madhya Pradesh, Hoshangabad District, Pachmarhi Wildlife Sanctuary, Satpura Mountain Range, Apsara Vihar (stream), ca. 3 km SSE Pachmarhi, 22°27'7"N 78°26'39"E.

TYPE MATERIAL: **Holotype** ♂ (NMW): "INDIA (MP8) southern \ Madhya Pradesh \ Hoshangabad Dist., Apsara \ Vihar [stream] 27.II.2008 \ leg. M. Jäch, S. & P. Sharma | ca. 3 km SSE Pachmarhi \ Satpura Range \ above Rajat Pratap \ ca. 910 m \ 22°27'07"N 78°26'39"E"; the specimen was collected in a stream, ca. 2–10 m wide, forming large pools, flowing through forest. **Paratypes**: **INDIA: Madhya Pradesh**: 6 exs. (NMW): same sampling data; 4 exs. (NMW): Hoshangabad Distr., southern Madhya Pradesh, Dhobighat Nala (stream), Pachmarhi Wildlife Sanctuary, Satpura Mountain Range, ca. 2 km SE Pachmarhi, 22°27'31"N 78°26'41"E, 900 m a.s.l., ca. 1–2 m wide, substrate: rock, flowing through forest, 27.II.2008, leg. M.A. Jäch, S. & P. Sharma "MP7"; 2 ♀♀ (NMW): Hoshangabad Distr., southern Madhya Pradesh, Panar Pani (stream), Matkuli – Pachmarhi road, ca. 5 km NNE Pachmarhi (small town), ca. 30 km S Piparia (town), 22°30'25"N 78°26'43"E, 850 m a.s.l., ca. 3–5 m wide, substrate: gravel and rocks, flowing through forest, 26./27.II.2008, leg. M.A. Jäch, S. & P. Sharma "MP6"; 2 ♀♀ (NMW): Hoshangabad Distr., southern Madhya Pradesh, Sona Bhadra (stream), at head of Denva River Reservoir, Lagdha Beta (area), Satpura Mountain Range, northern part of Satpura National Park, 22°31'38"N 78°11'18"E, 370 m a.s.l., ca. 5–10 m wide, including rock pools, 29.II.2008, leg. M.A. Jäch, S. & P. Sharma "MP16".

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with strongly reduced metafemoral pubescence, presence of apical infuscation on maxillary palpomere 4, and presence of apical emargination on ventrite 5, together with *A. falcatus*, *A. glaber*, *A. kallar*, *A. nanus*, *A. obsoletus*, *A. pullus*, and some individuals of *A. indicus*. Differs in black pronotum from *A. nanus* and *A. falcatus*, in wider extension of mesofemoral pubescence from *A. nanus* and *A. glaber*; in less wide extended mesofemoral pubescence from *A. falcatus*, *A. indicus*, *A. kallar*, *A. obsoletus*, and *A. pullus*. Very similar to *A. obsoletus*, including aedeagus (parameres straight, basal lobe shorter than parameres, styli present); differs in presence of fine punctures on head and pronotum. Differs in basal lobe (shorter than parameres) and parameres (almost straight) from *A. kallar*; in basal lobe (shorter than parameres) and parameres (almost straight) from *A. pullus*; in absence of shield-shaped structure and presence of styli from *A. indicus* and *A. pullus*.

DESCRIPTION: Total length: 1.8 mm; elytral width: 0.9 mm; E.I.: 1.4, P.I.: 2.1, elytra 3.0 times as long as pronotum. Habitus (Fig. 36) slender, evenly oval, strongly convex.

Coloration: Labrum, clypeus, and frons black, preocular patches absent; maxillary palpi yellow, palpomere 4 infuscated in apical half; pronotum black with undefined narrow brown margins; elytra dark brown; ventrites black; legs dark brown to black.

Head: Clypeus with moderately concave anterior margin, C.I.: 4.1, lateral length ratio clypeus/eyes = 1.4; microsculpture absent, ground punctures fine, interspaces 1–2 times as wide as punctures, systematic punctures distinct. Eyes large, but not protruding, slightly oblong. Antennae with eight antennomeres. Maxillary palpi slender, 1.1 times as long as pronotum in midline, 0.9 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.1, palpomere 4 almost symmetrical. Mentum with few, very fine punctures.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral ground punctation as on head and pronotum; four rows of systematic punctures distinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with mesal bulge.

Femora (Fig. 82): Pubescence present on less than proximal half of profemur, on proximal third of mesofemur, hairlines straight, pubescence restricted to a narrow anterior rim and to narrow proximal region adjacent to trochanter on metafemur.

Abdomen: Ventrite 5 with hemispherical apical emargination.

Aedeagus (Fig. 143): Length: 0.27–0.28 mm. Phallobase distinctly shorter than parameres, about as long as wide, rectangularly bending to long, narrow manubrium; border between pigmented and unpigmented portion of ventral face almost reaching manubrium. Parameres narrow, widest at midlength; margins almost straight; apex asymmetrical, slightly inclining mesad; dorsal face extending almost to midlength of phallobase. Median lobe narrow; lateral margins evenly converging to bluntly rounded apex, not reaching apex of parameres; styli present; corona in subapical position; basal apophyses long, almost reaching midlength of phallobase.

ECOLOGY: The specimens were found in streams between 370 and 910 m a.s.l., together with *A. connexus*.

DISTRIBUTION (Fig. 154): India (Madhya Pradesh).

ETYMOLOGY: The name *punctulatus* (Lat.) (= finely punctate) refers to the fine ground punctation of head and pronotum in contrast to the more or less obsolete punctures of the similar *A. obsoletus*.

Agraphydrus pygmaeus (KNISCH, 1924)

Helochares (*Helocharimorphus*) *pygmaeus* KNISCH 1924: 38.

Helochares (*Agraphydrus*) *pygmaeus* KNISCH: ORCHYMONT 1928: 108.

Agraphydrus (s.str.) *pygmaeus* (KNISCH): HANSEN 1999: 157; HANSEN 2004: 49; FIKÁČEK et al. 2015: 61.

TYPE LOCALITY: India, Uttarakhand, Kumaon Division, Almora District, W Almora.

TYPE MATERIAL: **Lectotype** (NHM), by present designation: “Type \ H.T. {red bordered round label} | W. Almora \ Kumaon, \ India, H.G.C. | Brit. Mus. 1925–42 | *Helochares* (*Helocharimorphus*) *pygmaeus* m. \ Knisch det. 1922 | det. Knisch \ W.E.Z. 1924 | LECTOTYPUS \ *Agraphydrus pygmaeus* (Knisch, 1924) \ des. Komarek 2018”. The lectotype was not dissected due to its rather poor condition, thus its sex could not be determined.

Paralectotypes: **INDIA: Uttarakhand**: 1 ♂, 1 ♀ (NHM): “W. Almora \ Kumaon, \ India, H.G.C. | *H. pygmaeus* K. \ Knisch {handwritten}”, specimens mounted on one card, male on left side, female on right side; 2 exs. (NHM): “Haldwani Dist. \ Kumaon, India \ H.G.C.”; 1 ♂, 1 ♀ (ISNB): “W. Almora \ Kumaon \ India. H.G.C. \ coll. d’Orchymont {mounted on a yellow label: “Coll. R.I.Sc.N.B. \ Inde”} | Knisch det. 1922 \ *Helochares* \ (*Heloch...morphus*) \ *pygmaeus* m. | Coll. A. Knisch \ COTYPUS {red label} | PARATYPUS {red label}”.

According to the original description the type series consists of nine specimens. The remaining two paralectotypes could not be found.

ADDITIONAL MATERIAL EXAMINED:

- I N D I A:** **Uttarakhand:** 4 exs. (NMW): Dehradun Distr., Mussourie, Mossy Falls, 22.III.1932, leg. H.G. Champion; **Meghalaya:** 1 ♂ (NMW): West Garo Hills Distr., Nokrek NP, 25°29.6'N 90°19.5'E, ca. 1100 m a.s.l., 9.–17.V.1996, leg. E. Jendek & O. Šauša.
- N E P A L:** **Central Region:** 2 exs. (NMW): Bagmati Zone, Sindhupalchok Distr., border to Tibet, Sun Kosi River at Tatobani, very cold, wide, deep, 27°56'37.9"N 85°56'56.8"E, 27.II.1981, leg. M.A. Jäch "N29"; 1 ♀ (NMW): Bagmati Zone, Sindhupalchok Distr., at Tatobani, near border crossing to Tibet, tributary of Sun Kosi River, somewhat smaller than main river, 28.II.1981, leg. M.A. Jäch "N29a"; 2 ♀♀ (NMW): Bagmati Zone, Sindhupalchok Distr., at Tatobani, Bairavund Khola, right tributary of Sun Kosi River, ca. 1600 m a.s.l., 1.III.1981, leg. M.A. Jäch "N32"; **Eastern Region:** 1 ♂, 2 ♀♀ (MHNG): Koshi Zone, Induwa Kola Valley, 1750 m a.s.l., sifting of moss and leaves near a spring, 14.IV.1984, leg. I. Löbl & A. Smetana; 1 ♂, 4 ♀♀ (MNS): Mechi Zone, Taplejung Distr., Yamputhin, 1650–1800 m a.s.l., 26.IV.–1.V.1988, leg. W. Schawaller & J. Martens "351"; **Western Region:** 4 exs. (MTD, NMW): Gandaki Zone, Mt. Panchase, 15 km W Pokhara, E exposed stream above Sidhane, 1700–1800 m a.s.l., 16.V.1997, leg. O. Jäger; 16 exs. (MTD): Gandaki Zone, Mt. Panchase, 15 km W Pokhara, E exposed stream near Sidhane, 1500–1700 m a.s.l., 15.V.1997, leg. O. Jäger; 1 ♀ (MTD): same locality data, but 2000 m a.s.l., 18.V.1997; 16 exs. (MTD): Gandaki Zone, Lamjung Distr., Annapurna Mts., Madi Khola, "Ufertümpel an Wasserkraftstation {pool at hydropower station} Siklis", 1500 m a.s.l., 10.V.1996, leg. O. Jäger; 5 exs. (MTD): Gandaki Zone, Annapurna Mts., Lamjung Distr., Madi Khola, "Zufluß an Wasserkraftstation {inflow stream at hydropower station} Siklis", 1450 m a.s.l., 10.V.1996, leg. O. Jäger; 5 exs. (MTD): Gandaki Zone, Annapurna Mts., Lamjung Distr., Madi Khola Valley, 3 km N Siklis, 1750 m a.s.l., 26.IV.1996, leg. O. Jäger; 2 exs. (MTD): Gandaki Zone, Annapurna Mts., south slope, Lamjung Distr., Madi Khola Valley, small river near Siklis, 1750 m a.s.l., 26.IV.1996, leg. O. Jäger; 17 exs. (SEMC, MTD): Gandaki Zone, Annapurna Mts., NE Pokhara, south below Krapa Danda, 1800–1900 m a.s.l., 27./28.V.1997, leg. O. Jäger; 1 ♀ (MTD): Gandaki Zone, Annapurna, N Pokhara, Kali Khola, below Garland (village), 1000–1200 m a.s.l., 18.IV.1996, leg. O. Jäger; 1 ♀ (NMW): Gandaki Zone, Kaski Distr., Annapurna, tributary of Madi Khola River near Kwinkal (ca. 10 km ENE Pokhara), ca. 28°13'55"N 84°5'16"E, ca. 750 m a.s.l., 15.V.1996, leg. O. Jäger; 1 ex. (NMW): Gandaki Zone, Kaski Distr., Annapurna Mts., Tikhendhunga (village), 1500 m a.s.l., 28°20'93"N 83°44'53"E, river, 20.IV.2000, leg. A. Skale; 2 exs. (NMW): Gandaki Zone, Kaski Distr., 20 km NW Pokhara, Lumle, 1600 m a.s.l., leg. G. Wewalka, 2.V.1984 "N2"; 3 ♂♂, 1 ♀ (NMW): Gandaki Zone, Gorkha Distr., Manaslu Mts., Bara Pokhari Lekh, Chhandi Khola Valley, 2000–2200 m a.s.l., 11./12.IV.2003, leg. J. Schmidt.
- B H U T A N:** 10 exs. (NMW): Punakha Prov., Mo Chhu (river), Jigme Dorji NP, at suspension bridge to Chhephu, ca. 16 km NW of Punakha, 27°41'54"N 89°46'1"E, ca. 1450 m a.s.l., ca. 30 m wide, large gravel banks, springfed and residual pools, 28.XI.2005, leg. M.A. Jäch "32".

DIFFERENTIAL DIAGNOSIS: Shares strongly convex habitus, eight-segmented antennae, unicolored palpomeres, absence of clypeal microsculpture, coarse ground punctation, extension of femoral pubescence, and absence of emargination on ventrite 5 with *A. hygropetricus*; differs in broader habitus, less extended femoral pubescence. Very similar to *A. yunnanensis* KOMAREK & HEBAUER, 2018, differs in stronger ground punctation and darker coloration of pronotum and elytra. Shares eight-segmented antennae, unicolored yellow maxillary palpomeres, absence of clypeal microsculpture, extended femoral pubescence, and absence of excision on ventrite 5 also with *A. fujianensis*, *A. fasciatus*, and *A. wangmiaoi*.

DESCRIPTION: Total length: 1.6–2.2 mm; elytral width: 0.9–1.0 mm; E.I.: 1.1–1.3, P.I.: 2.2–2.3, elytra 2.8–3.1 times as long as pronotum. Habitus (Fig. 37) broad, evenly oval, strongly convex.

Coloration: Labrum dark brown or black, clypeus black with indistinctly defined yellow preocular patches, reduced to narrow yellow rim at lateral margins or absent in some individuals; frons black; maxillary palpi unicolored yellow; pronotum yellow, unicolored or with dark brown center of variable extension present in some individuals, or largely dark brown with weakly defined indistinct brighter margins; elytra light brown, or dark brown with undefined brighter areas of variable extension, mainly antero-mesally and posteriorly, narrow yellow lateral margins present in many individuals; ventrites dark brown; legs lighter brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 4.1, lateral length ratio clypeus/eyes = 2.3; microsculpture absent, ground punctures coarse, distinctly impressed, interspaces about as wide as punctures or slightly wider, systematic punctures moderately distinct. Eyes small, not protruding, slightly oblong. Antennae with eight antennomeres. Maxillary palpi moderately stout, 0.9–1.0 times as long as pronotum in midline, 0.7 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.2–1.4, palpomere 4 symmetrical. Mentum with very fine widely separated punctures, without microsculpture.

Thorax: Pronotal ground punctation as on head or slightly finer, systematic punctures moderately distinct. Elytral ground punctation as coarse as on head, interspaces about as wide as punctures or slightly wider, slightly stronger and with denser distribution in lateral third than on mesal portion. Four rows of systematic punctures indistinctly visible among irregular ground punctation, mesal rows 1–3 strongly reduced in number, not reaching anterior margin. Mesoventrite with mesal bulge and very low crescent-shaped horizontal ridge.

Femora (Fig. 83): Pubescence present on more than proximal half of pro- and metafemur, on proximal 2/3 of mesofemur, hairlines weakly oblique on pro- and mesofemur, straight on metafemur.

Abdomen: Ventrite 5 without apical emargination, or excision present, less than 4 μm deep, visible in 400 \times magnification.

Aedeagus (Fig. 144): Length: 0.23–0.27 mm. Phallobase wide, about as long as parameres, as long as wide; margins abruptly bending to triangular manubrium; border between pigmented and unpigmented portion of ventral face almost reaching manubrium. Parameres stout; mesal margins of ventral face wide basally, kinking at midlength to narrower apical half; apex bluntly rounded, not inflated, not inclining; dorsal face reaching midlength of phallobase mesally. Median lobe short; dorsal face finger-shaped, apex not reaching apex of parameres; ventral face much shorter than dorsal face, almost globular; corona in basal position; basal apophyses widely separated, strongly inclining laterad, weakly extending into phallobase.

ECOLOGY: The specimens were found in rivers and streams between 500 and 2200 m a.s.l.; in Meghalaya they were collected together with *A. kempfi*; in Uttarakhand together with *A. communis*, *A. constrictus*, *A. indicus*, *A. kempfi*, and *A. pauculus*; in the Central Region of Nepal together with *A. communis* and *A. pauculus*; in the Eastern Region together with *A. communis*, *A. indicus*, and *A. nepalensis*; and in the Western Region together with *A. communis*, *A. kempfi*, *A. pauculus*, and *A. stagnalis*.

DISTRIBUTION (Fig. 155): Bhutan: first record, [China (Tibet)], India (Uttarakhand, Meghalaya), Nepal (Central Region, Eastern Region, Western Region).

For the record from China (Tibet) see above, under *A. pauculus*.

Agraphydrus rostratus sp.n.

TYPE LOCALITY: India, Tamil Nadu, Nilgiris District, Nilgiri Hills, Kotagiri (town) environment, Honnatti, ca. 11°25'N 76°55'E.

TYPE MATERIAL: **Holotype** σ (NMW): INDIA: "Tamil Nadu, 19.1.1999 \ Nilgiri Hills, Kotagiri env. \ Honnatti, 11°25'N 76°55'E \ 1500 m, leg. D. Boukal (75)"; the specimen was collected in a stream, ca. 1–2 m wide, ca. 10 cm deep, steep, with boulders, pools, substrate (large stones and pebbles) somewhat unstable, with leaf packs, decaying plants, moss on a few large stones, rather fast flowing, well shaded, with rich shore vegetation, draining tea plantations and remnants of disturbed primary forest, slightly polluted. **Paratypes**: **INDIA**: **Tamil Nadu**: 30 exs. (NMW); same sampling data; 1 σ (NMW): Nilgiris Distr., Nilgiri Hills, Manjoor env., Chamraj estate, 11°19'N 76°41'E, 2000 m a.s.l., small stream, less than 0.5 m wide, shallow, steep, almost entirely grooved, large stones, pebbles, gravel, silt, leaf packs, decaying plants, flow moderate, partly shaded, draining tea plantation, 21.1.1999,

leg. D. Boukal "77"; 1 ♂ (NMW): Nilgiris Distr., Nilgiri Hills, Kotagiri env., Quinshola, 11°25'N 76°55'E, 1500 m a.s.l., small stream, less than 1 m wide, rather shallow, moderately fast flowing, polluted (erosion, litter), draining tea and tree plantations, 19.I.1999, leg. D. Boukal "73"; 1 ♂ (NMW): Nilgiris Distr., Nilgiri Hills, Melkundah (village), 11°14'N 76°37'E, 2100 m a.s.l., small stream, ca. 1m wide, shallow, with pebbles and some leaf packs, slowly to moderately fast flowing, rather shaded, draining forest and tea plantations, 23.I.1999, leg. D. Boukal "82"; **Kerala:** 1 ♂ (NMW): Idukki Distr., Cardamom Hills, 10 km SW Kumily, Vallakadavu, 9°31'N 77°97'E, 1000 m a.s.l., miniature pool at the bottom of a rock, formed by a tiny stream, full of leaves, 24.XII.1993, leg. D. Boukal & Z. Kejval "10"; 1 ♂, 1 ♀ (NMW): ca. 30 km NNE Thiruvananthapuram, Kallar, ca. 8°43'N 77°7'E, 120–150 m a.s.l., in 2–3 hydropetric places along large, ca. 1–2 m wide stream close to the large waterfall and Golden Valley Mineral Water Project, all places fairly exposed, Hydrophilidae collected on mossy uneven surface and in cracks on rocks near the waterfall, 1.I.1999, leg. D. Boukal "34"; 1 ♀ (NMW): same locality, date and collector, small pools in rocks along large stream with decaying bamboo leaves, partly shaded, "36"; 2 ♂♂ (NMW): Thiruvananthapuram Distr., ca. 30 km NNE Thiruvananthapuram, Kallar, Ponmudi – Kallar road, ca. 8°43'N 77°5'E, 150–200 m a.s.l., hydropetric on wet granite block with a few leaves and algal growth, 30.XII.1998, leg. D. Boukal (28); 1 ♀ (NMW): 10 km WSW Munnar, Kallar Valley, 10°03'N 76°59'E, 1200 m a.s.l., hydropetric habitat, wet rock with leaves, very small discharge, 8.I.1999, leg. D. Boukal "53".

DIFFERENTIAL DIAGNOSIS: Shares strongly convex habitus, nine-segmented antennae, unicoloral palpomeres, absence of clypeal microsculpture, coarse ground punctation, extension of femoral pubescence, and absence of emargination on ventrite 5 with *A. inflatus*, *A. rugosus*, *A. tumulosus*, and *A. uvaensis*; differs in smaller size and equal, less coarse ground punctation of pronotum and elytra from *A. rugosus* and *A. uvaensis*.

DESCRIPTION: Total length: 1.9–2.5 mm; elytral width: 0.9–1.3 mm; E.I.: 1.3–1.4, P.I.: 2.1, elytra 3.0–3.1 times as long as pronotum. Habitus (Fig. 38) moderately broad, evenly oval, strongly convex.

Coloration: Labrum, clypeus and frons black, undefined narrow yellow lateral margins present on clypeus in some individuals; maxillary palpi unicoloral yellow; pronotum black, with indistinct, undefined, narrow yellow margins; elytra black with decreasing intensity of coloration at lateral and posterior areas in some individuals; ventrites dark brown; legs slightly lighter brown.

Head: Clypeus with weakly concave anterior margin, C.I.: 3.6, lateral length ratio clypeus/eyes = 1.5–1.7; microreticulation absent, except on a very narrow rim at lateral margins in some individuals, ground punctures coarse, distinctly impressed, interspaces 1–2 times as wide as punctures, systematic punctures moderately distinct. Eyes large, but not protruding, slightly oblong. Antennae with nine antennomeres. Maxillary palpi stout, 0.7–0.8 times as long as pronotum in midline, 0.7 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.0–1.1, palpomere 4 almost symmetrical. Mentum with very fine, widely separated punctures, without microsculpture.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral ground punctation slightly stronger than on head and pronotum, interspaces 1–2 times as wide as punctures; four rows of systematic punctures moderately distinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with distinct bulge.

Femora (Fig. 84): Pubescence present on proximal 2/3 of femora, hairlines straight.

Abdomen: Ventrite 5 without excision.

Aedeagus (Fig. 145): Length: 0.39–0.42 mm. Phallobase about as long as parameres, as long as wide, abruptly bending to long, triangular manubrium; border between pigmented and unpigmented portion of ventral face indistinct, reaching midlength of basal lobe. Parameres distinctly wider basally than apically; lateral margins distinctly sigmoid; apex flattened, with blunt mesal corner, and sharply pointed, beak-shaped, lateral extension; dorsal face reaching distal third of phallobase mesally. Median lobe wide basally; dorsal face distinctly wider than

ventral face; apex not reaching apex of parameres; corona large, in basal position; basal apophyses widely separated, distinctly bending laterad.

ECOLOGY: The specimens were found in rock pools full of leaves, and in hygropetric habitats between 300 and 2100 m a.s.l.; in Kerala they were collected together with *A. boukali*, *A. falcatus*, and *A. obsoletus*, in Tamil Nadu together with *A. obsoletus*.

DISTRIBUTION (Fig. 155): India (Kerala, Tamil Nadu).

ETYMOLOGY: The name *rostratus* (Lat.) (= beak-shaped) refers to the beak-shaped extension of the parameres.

Agraphydrus rugosus sp.n.

TYPE LOCALITY: India, Tamil Nadu, Nilgiris District, Nilgiri Hills, 15 km SE Kotagiri (town), Kunjapanai (village), ca. 11°22'N 76°56'E.

TYPE MATERIAL: **Holotype**: ♂ (NMW): "S-INDIEN, 15.XI.1993 \ Tamil Nadu, Nilgiri Hills \ 15 km SE Kotagiri (3) \ Kunchappanai, 900 m | 76°56'E 11°22'N \ leg. Boukal & Kejval". **Paratypes**: **INDIA: Tamil Nadu**: 5 exs. (NMW): Salem Distr., Shevaroy Hills, 5 km SE Cauvery Peak, 11°48'N 78°16'E, 1100 m a.s.l., streamlet and hygropetric film of water running over a rock, and tiny, partly isolated pools on top and at base of the rock with some dead leaves, at most a few cm deep, rather shaded, draining degraded forest, shrubs, slightly polluted, 26.I.1999, leg. D. Boukal "89"; **Kerala**: 1 ♀ (NMW): Thiruvananthapuram Distr., Cardamom Hills, 50 km NW Pathanamthitta, near Pambaiyar River, 300 m a.s.l., 9°25'N 77°5'E, at light, 6.–9.V.1994, leg. Z. Kejval.

DIFFERENTIAL DIAGNOSIS: Shares strongly convex habitus, nine-segmented antennae, unicolored palpomeres, absence of clypeal microsculpture, coarse ground punctation, extension of femoral pubescence, and absence of emargination on ventrite 5 with *A. inflatus*, *A. rostratus*, *A. tumulosus* and *A. uvaensis*. Shares large size, coarser elytral ground punctation with narrow interspaces with *A. uvaensis*, differs in absence of serially arranged elytral ground punctures.

DESCRIPTION: Total length: 2.8–3.0 mm; elytral width: 1.4–1.6 mm; E.I.: 1.4, P.I.: 1.9, elytra 2.9 times as long as pronotum. Habitus (Fig. 39) slender, evenly oval, strongly convex.

Coloration: Labrum black, clypeus black with very narrow orange lateral margins, preocular patches absent; frons black; maxillary palpi unicolored yellow; pronotum black with very narrow yellow lateral margins; elytra black with light brown, undefined, apical area; ventrites and legs black.

Head: Clypeus with distinctly concave anterior margin, without microsculpture, C.I.: 3.7, lateral length ratio clypeus/eyes = 1.6–1.7; microsculpture absent, some indistinct wrinkles along lateral margin present in some individuals, ground punctures coarse, distinctly impressed, interspaces 1–2 times as wide as punctures, systematic punctures indistinct. Eyes large, distinctly protruding, slightly oblong. Antennae with nine antennomeres. Maxillary palpi stout, 0.7 times as long as pronotum in midline, 0.8 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.0, palpomere 4 almost symmetrical. Mentum with some fine punctures on lateral portions.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral ground punctation coarse, distinctly stronger than on head and pronotum; interspaces as wide as punctures on disk, smaller on posterior portion, punctures confluent on apical region. Four rows of systematic punctures indistinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with very low, sharply edged projection in posterior half, composed of crescent-shaped crest and short median carina.

Femora (Fig. 85): Pubescence present on proximal 2/3 of femora, hairlines straight.

Abdomen: Ventrite 5 without emargination, stiff setae absent.

Aedeagus (Fig. 146): Length: 0.51–0.52 mm. Phallobase about as long as parameres, slightly longer than wide, abruptly bending to long, wide, manubrium; border between pigmented and unpigmented portion of ventral face very indistinct. Parameres rather slender, margins almost evenly converging apicad; apex asymmetrical, acuminate, not inclining; dorsal face distinctly extending into phallobase, not reaching midlength, ventral face shorter and wider than dorsal face. Median lobe slender, widest distal of midlength; apex bluntly rounded, almost reaching apex of parameres; styli absent; ventral plate present, distinct, short, with lateral margins evenly converging to sharply pointed apex; corona large, in basal position; basal apophyses long, extending to distal third of phallobase.

ECOLOGY: The specimens were found in hygropetric sites, in a streamlet with small isolated pools, and at light between 300 and 1100 m a.s.l., together with *A. heinrichi*, *A. nanus*, *A. obscuratus*, and *A. obsoletus*.

DISTRIBUTION (Fig. 155): India (Kerala, Tamil Nadu).

ETYMOLOGY: The name *rugosus* (Lat.) (= rugose) refers to the strongly impressed, coarse elytral ground punctation.

Agraphydrus sipekorum sp.n.

TYPE LOCALITY: India, Meghalaya, East Khasi Hills District, 11 km SW Cherrapunjee, Laitkynsew, 25°12'48"N 91°39'48"E.

TYPE MATERIAL: **Holotype** ♂ (NMP): “INDIA, Meghalaya state (7+9) \ East Khasi Hills, 11 km SW Cherra- \ punjee, Laitkynsew, 25.iv.2008 \ 25°12'48"N 91°39'48"E, 735 m \ Fikáček, Podskalská, Šípek {Šípek} lgt. | small lithotelmata on stony \ banks of a stream, exposed \ partly with mud/gravel on \ bottom”. **Paratypes**: 3 ♂♂, 3 ♀♀ (NMP, NMW): same sampling data.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with strongly reduced metafemoral pubescence, apical infuscation of maxillary palpomere 4, and absence of apical emargination of ventrite 5, together with *A. khasiensis*, *A. nepalensis* and most individuals of *A. indicus*. Shares brown pronotum and elytra and presence of large plate-like structure on median lobe with *A. khasiensis*; differs in moderately convex habitus, fine ground punctures, carinate meso-ventrite, and aedeagus (shield-shaped structure trapezoid, apex of parameres with lateral extension).

DESCRIPTION: Total length: 2.0–2.1, elytral width: 1.0–1.1 mm; E.I.: 1.2–1.4, P.I.: 2.1, elytra 2.6–3.1 times as long as pronotum. Habitus (Fig. 40) broad, evenly oval, moderately convex.

Coloration: Labrum, clypeus, and frons black with indistinct, dark yellow, preocular patches, less wide than eyes; maxillary palpi yellow with indistinct apical infuscation on apex of palpomere 4; pronotum dark brown mesally, with rather wide, undefined lighter brown margins; elytra dark yellowish brown; ventrites black; legs light brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 3.6–4.0, lateral length ratio clypeus/eyes = 1.3–1.5; microreticulation absent; ground punctures fine, interspaces two times as wide as punctures, systematic punctures distinct. Eyes large, but not protruding, slightly oblong. Antennae with eight antennomeres. Maxillary palpi moderately slender, 1.1 times as long as pronotum in midline, 0.9 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.1–1.2, palpomere 4 almost symmetrical. Mentum with few, very fine, punctures, grouped laterally.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral ground punctation as on head; four rows of systematic punctures distinct, mesal rows almost reaching anterior margin. Mesoventrite with low, indistinct, mesal carina posteriorly.

Femora (Fig. 86): Pubescence present on proximal half of pro- and mesofemur, restricted to very narrow rim at anterior margin and small proximal area adjacent to trochanter; hairline oblique on profemur, straight on mesofemur.

Abdomen: Ventrite 5 without apical emargination.

Aedeagus (Fig. 147): Length: 0.32–0.34 mm. Phallobase slightly shorter than parameres, about as long as wide, almost evenly rounded, manubrium absent; border between pigmented and unpigmented portion of ventral face reaching proximal margin. Parameres wide basally; lateral margin with strong subapical constriction; mesal margin weakly sigmoid; apex obliquely flattened with large, beak-shaped, sharp, lateral extension and blunt mesal angle; basal portion of base very weakly reaching into phallobase. Median lobe wide basally; dorsal face strongly narrowing to apex, exceeding apex of parameres; ventral face distinctly wider than dorsal face with broadly rounded apex; corona in subapical position; styli absent; reinforcing plate present, trapezoidal, with emarginated distal and proximal margins; basal apophyses long, widely separated, extending to distal third of phallobase.

ECOLOGY: The specimens were found in a stream at about 735 m a.s.l.

DISTRIBUTION (Fig. 155): India (Meghalaya).

ETYMOLOGY: The species is dedicated to Hana Šípková (former Podskalská) and Petr Šípek.

Agraphydrus stagnalis (ORCHYMONT, 1937)

Helochares (*Agraphydrus*) *stagnalis* ORCHYMONT 1937b: 37.

Agraphydrus (s.str.) *stagnalis* (ORCHYMONT): HANSEN 1999: 157; HANSEN 2004: 49; FIKÁČEK et al. 2015: 61.

TYPE LOCALITY: Pakistan, Punjab, Jhelum District, Khewra Gorge.

TYPE MATERIAL (not examined): **Holotype** (IMK, ORCHYMONT 1937b), sex unknown: Punjab, Khewra Gorge, NNW Khewra, station 7, 31.III.1931, leg. H.S. Pruthi. **Paratypes**: 1 ♂, 1 ♀ (IMK): from the same locality, date, and collector (ORCHYMONT 1937b).

ADDITIONAL MATERIAL EXAMINED:

I N D I A: Uttarakhand: 2 ♂♂, 2 exs. (NHM): Kumaon Division, Nainital Distr., Haldwani, leg. H.G. Champion; 1 ♂ (NHM): Kumaon Division, Central Almora, leg. H.G. Champion; 2 ♀♀ (NHM): Kumaon Division, Almora Distr., Ranikhet, leg. G.C. Champion; 5 exs. (NMW): Almora Distr., Kosi River, ca. 1 km upstream of Hawalbagh (village), ca. 8 km WNW Almora (town), 29°39'21"N 79°38'4"E, 1160 m a.s.l., ca. 20–30 m wide, with furcations, 15.XI.2006, leg. M.A. Jäch "24"; 1 ♂ (NMW): Almora Distr., Dwarso (village), ca. 5 km E Katpuriya (village), 29°39'56"N 79°32'5"E, 1680 m a.s.l., hardly flowing chain of residual pools, in pine forest, 15.XI.2006, leg. M.A. Jäch "25"; 4 exs. (NMW): Chamoli Distr., Bilkhuri (spring brook), at Taal (village), between Tharali (or Tharli) and Gwaldam, 30°1'4"N 79°31'56"E, 1930 m a.s.l., ca. 1 m wide, flowing through densely forested gorge, 12.XI.2006, leg. M.A. Jäch "16"; 1 ♂ (NMW): Dehradun Distr., Sukma River, right tributary of Ganga River, ca. 5 km S Raiwala (village), ca. 10 km N Haridwar (town), 30°03'23"N 78°12'54"E, ca. 340 m a.s.l., flowing in gravel bed of ca. 100 m width, with several furcations (up to 20 m wide), through degraded forest and populated areas, 9.XI.2006, leg. M.A. Jäch "4"; 1 ♂, 3 ♀♀ (NMW): Dehradun Distr., Rayi River, right tributary of Song River, at Lachiwala Recreation Area, SW Doiwala (village), ca. 15 km SE Dehradun (town), ca. 520 m a.s.l., 30°12'35"N 78°7'54"E, ca. 15 m wide, metarhithral, flowing through degraded forest, 9.XI.2006, leg. M.A. Jäch "2"; 1 ♂ (NMW): Pauri Garhwal or Rudraprayag Distr., Alaknanda River, at Dhari Devi Temple, below Kaliasaur (village), ca. 10 km SW Rudraprayag (town), 30°15'20"N 78°52'36"E, 580 m a.s.l., ca. 20–40 m wide, with large gravel bank, flowing through wide gorge, 11.XI.2006, leg. M.A. Jäch "9"; 1 ♂ (NMW): Tehri Garhwal Distr., Henvl River, right tributary of Ganga River, at Shivpuri (village), ca. 10 km NNE Rishikesh (town), 30°8'17"N 78°23'13.5"E, 400 m a.s.l., furcations (up to 10 m wide) in wide gravel bed, 10.XI.2006, leg. M.A. Jäch "6"; 2 ♂♂, 1 ♀ (NMW): Tehri Garhwal Distr., Dahrad (stream), right tributary of

- Ganga River, at Gular (village), ca. 5 km W Byasi (village), 30°06'57"N 78°26'12"E, 450 m a.s.l., ca. 2–3 m wide, flowing through forested gorge, 10.XI.2006, leg. M.A. Jäch "7"; **Himachal Pradesh**: 1 ♂, 1 ♀ (NHM): Mandi Distr., Dhelu (village), 4500 ft., leg. H.G. Champion; 1 ♂ (NHM): Mandi Distr., Jalori Pass, Seraj, 10800 ft., leg. H.G. Champion; 2 exs. (NHM): Kangra Distr., Shahpur, 4000 ft., leg. H.G. Champion.
- N E P A L**: **Central Region**: 3 ♂♂, 1 ♀ (NMW): Narayani Zone, Makwanpur Distr., Rapti River at Hetauda (city), wide, with gravel, 17.II.1981, leg. M.A. Jäch "N17"; 2 ♂♂, 2 ♀♀ (NMW): Bagmati Zone, N Kathmandu, Sun Kosi River at Lamosangu (village), 5.II.1981, leg. M.A. Jäch "N5"; **Eastern Region**: 1 ♀ (NMW): Koshi Zone, Sunsari Distr., Sardu River, at Dharan, at bank of river, 12.II.1981, leg. M.A. Jäch "N10"; **Western Region**: 18 exs.: (MTD, NMW): Gandaki Zone, Gorka Distr., Annapurna Mts., Marsyandi River Valley, stream at Besi Sahar (municipality), 800 m a.s.l., 28.VIII.1995, leg. O. Jäger; 1 ♂ (MTD): Gandaki Zone, Gorkha Distr., Annapurna Mts., Pokhara – Pame, 800 m a.s.l., 18.V.1996, leg. J. Schmidt & O. Jäger; 1 ♀: (MTD): Gandaki Zone, Kaski Distr., Annapurna, Madi Khola Valley at Bhaise, ca. 900 m a.s.l., 15.V.1996, leg. O. Jäger; 6 exs. (MNS, MTD, NMW): Gandaki Zone, Gorkha Distr., Dumre, river and edge pools, 17.VI.1997, leg. O. Jäger; 2 ♂♂, 1 ♀ (MTD): Gandaki Zone, Annapurna, N Pokhara, Kali Khola, below Garlang (village), 1000–1200 m a.s.l., 18.IV.1996, leg. O. Jäger; 4 exs. (NMW): Gandaki Zone, Kaski Distr., Pokhara Valley, 22.II.1981, leg. M.A. Jäch "N25"; 5 exs. (MTD, NMW): Gandaki Zone, Kaski Distr., Pokhara Valley, 3 km NW Pame, ca. 800 m a.s.l., 16.V.1997, leg. O. Jäger; 2 ♀♀ (NMW): Lumbini Zone, Arghakhanchi Distr., Chidika, Saurae Khola, 17.I.1994, leg. S. Sharma "73"; 3 exs. (NMW): Gandaki Zone, Syangja Distr., Galyang (municipality), Andhi Khola, 650 m a.s.l., 3.I.1994, leg. S. Sharma "62"; **Mid-Western Region**: 1 ♀ (NMW): Rapti Zone, Dang Distr., Majhgaon, Hapur Khola, 23.XII.1993, leg. S. Sharma "54"; 3 exs. (NMW): Rapti Zone, Pyuthan Distr., Devasthan, Arung Khola, 25.XII.1993, leg. S. Sharma "57".
- B H U T A N**: 1 ♂ (NMW): Sarpang Prov., Sarpang, stream, left tributary of Sarpang Khola, 26°52'05"N 90°15'52"E, ca. 330 m a.s.l., ca. 2 m wide, flowing through cultivated land and settlements, 26.XI.2005, leg. M.A. Jäch "28"; 2 ♂♂, 1 ♀ (NMW): Tsirang Prov., Nyara Chhu (river, right tributary of Puna Tsang Chhu), ca. 44 km SSE of Wangdi Phodrang, 27°10'22"N 90°3'48"E, ca. 550 m a.s.l., ca. 8 m wide, furcations, residual pools, fast flowing, through unforested valley, 25.XI.2005, leg. M.A. Jäch "22".

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with microsculpture present along anterior margin of clypeus and unicolored yellow maxillary palpomeres, together with *A. communis*, *A. crassipennis*, *A. pauculus*, *A. protentus*, and some specimens of *A. kempi*, differing in the aedeagus. Deep black individuals very similar to specimens of *A. kempi*, can be separated in slightly smaller size. Specimens with lighter brown elytra differ from *A. communis*, *A. pauculus*, and *A. protentus* in the aedeagus (basal apophyses of median lobe strongly bending laterad) and smaller size, from *A. communis* moreover in larger extension of shagreenation on anterior clypeal margin (not interrupted mesally).

DESCRIPTION: Total length: 2.0–2.4 mm; elytral width: 0.9–1.2 mm; E.I.: 1.4, P.I.: 2.0, elytra 3.0 times as long as pronotum. Habitus (Fig. 41) slender, elytra parallel-sided, moderately convex.

Coloration: Labrum and clypeus dark brown to black, clypeus with undefined yellow lateral margins; frons black; maxillary palpi unicolored yellow; pronotum dark brown or black with narrow yellowish lateral margins; elytra black with a very narrow yellow lateral margin, or light brown with dark brown to black sublateral band widening anteriorly, and with a narrow yellow lateral margin; ventrites dark brown to black; legs light brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 3.8, lateral length ratio clypeus/eyes = 1.3–1.5; distinct microreticulation present on lateral and anterior margins, ground punctures fine, interspaces about two times as wide as punctures, systematic punctures distinct. Eyes large, distinctly protruding, circular. Antennae with nine antennomeres. Maxillary palpi slender, 1.2 times as long as pronotum in midline, 1.1 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.3, palpomere 4 almost symmetrical. Mentum with very fine, very widely spaced punctures, with indistinct microsculpture on lateral portion.

Thorax: Pronotal punctures as on head, systematic punctures distinct, some coarse punctures present along lateral margins. Elytral ground punctation as on head and pronotum, systematic

punctures moderately distinct, strongly reduced in number, not reaching anterior margin. Mesoventrite with a very low mesal bulge.

Femora (Fig. 87): Pubescence present on proximal 2/3 of femora, hairlines oblique on profemur, straight on meso- and metafemur.

Abdomen: Ventrite 5 with flat to almost semicircular apical emargination, ca. 10–20 μm deep.

Aedeagus (Fig. 148): Length: 0.25–0.30 mm. Phallobase about as long as parameres, about as long as wide, not abruptly bending to wide, moderately long manubrium; border between pigmented and unpigmented portion of ventral face indistinct. Parameres wide; apex blunt, not inflated, not inclining; dorsal face reaching distal third of phallobase mesally; ventral face distinctly shorter than dorsal face. Median lobe narrow, finger-shaped; apex almost reaching apex of parameres; styli present, not reaching apex of median lobe; corona situated slightly distal of midlength; basal apophyses narrowly separated, moderately long, distinctly bending laterad, almost reaching midlength of basal lobe.

COMMENTS: The original description by ORCHYMONT (1937b) fits quite well with the characters of the specimens from India, Nepal and Bhutan (nine-segmented antennae; black coloration of head and pronotum; elytra “more brown, with narrow testaceous border at the sides”; entire palpi and tarsi yellow; punctuation very fine; inner series of coarser punctures “very sparsely furnished”; emargination of fifth ventral segment minute and not very distinct). Although ORCHYMONT (1937b) did not mention the very narrow chagration on the anterior border of the clypeus, I believe that the specimens listed under Additional Material can be assigned to *A. stagnalis*.

Specimens with deep black pronotal and elytral coloration occur together with light brown colored individuals, intermediate variants are very rare.

ECOLOGY: In India, Nepal and Bhutan specimens were found in rivers, streams, residual pools, edge pools, and spring brooks between 330 and 1930 m a.s.l.; in Bhutan they were collected together with *A. bhutanensis*, *A. connexus*, *A. indicus*, and *A. kempfi*; in Uttarakhand together with *A. constrictus*, *A. indicus*, *A. kempfi*, and *A. pauculus*; in Nepal together with *A. annapurnensis*, *A. ater*, *A. communis*, *A. constrictus*, *A. crassipennis*, *A. kempfi*, *A. pauculus*, *A. pullus*, and *A. pygmaeus*. At the type locality (Pakistan) specimens were collected in a “large pool in the course of the stream” (ORCHYMONT 1937b).

DISTRIBUTION (Fig. 155): Bhutan: first record, India (Himachal Pradesh, Uttarakhand), Nepal (Central Region, Eastern Region, Mid-Western Region, Western Region), Pakistan (Punjab).

Agraphydrus taprobanensis sp.n.

TYPE LOCALITY: Sri Lanka, Sabaragamuwa Province, Ratnapura District, Ratnapura (city).

TYPE MATERIAL: **Holotype** σ (ZML): “Ceylon, Sabaragamuwa \ Prov. At light \ Ratnapura \ 22.II.1962. Loc. 95 | In light trap | Lund University \ Ceylon Expedition 1962 \ Brinck – Andersson – Cederholm”. **Paratypes**: **SRI LANKA**: 12 exs. (NMW, ZML): same sampling data; 2 φ φ (ZML): Sabaragamuwa Province, Ratnapura Distr., Kitulgala (village), 21 miles N Ratnapura, at light, 17.III.1962, leg. P. Brinck, H. Andersson, L. Cederholm “Loc. 152”; 5 exs. (NMW, ZML): Western Province, Gampaha Distr., Yakkala (township), Dambuwa Estate, 18 miles NE Colombo, at light, 30 m a.s.l., 14.–31.I.1962, leg. P. Brinck H. Andersson & L. Cederholm “Loc. 10”; 4 φ φ (ZML): same sampling data, but 20.I.1962, “Loc. 16: I”; 2 exs. (CAS): Dambuwa Estate, 17.IV.1965, “K.L.A. Perera coll., Cal. Acad. Sci. Access.”; 1 ex. (CAS): same sampling data, but 15.V.1965.

DIFFERENTIAL DIAGNOSIS: Belongs to group of species with apically infuscated maxillary palpomere 4, metafemoral pubescence present on at least proximal half, and absence of clypeal microsculpture, together with *A. anatinus*, *A. ater*, *A. cinnamum*, *A. constrictus*, *A. coomani*, *A. heinrichi*. Shares low mesoventral carina and pubescence on proximal half of metafemur with *A.*

anatinus; differs in eight-segmented antennae, presence of emargination on ventrite 5, and aedeagus (phallobase much shorter than parameres, parameres with blunt lateral extension, median lobe narrow, not bottle-shaped, with distinct semilunar structure at midlength).

DESCRIPTION: Total length: 1.9–2.0 mm; elytral width: 0.9–1.0 mm; E.I.: 1.3–1.4, P.I.: 2.1, elytra 2.9 times as long as pronotum. Habitus (Fig. 42) moderately broad, evenly oval, strongly convex.

Coloration: Labrum, clypeus and frons dark brown or black, clypeus with yellow preocular patches about at most as wide as diameter of eye, very weakly defined; maxillary palpi yellow, palpomere 4 infuscated in less than apical half; pronotum and elytra unicolored yellow or light brown; ventrites and legs dark brown.

Head: Clypeus with distinctly concave anterior margin, C.I.: 3.5, lateral length ratio clypeus/eyes = 1.9; microreticulation absent, ground punctures very fine, widely spaced, systematic punctures moderately distinct. Eyes large, but not protruding, slightly oblong. Antennae with eight antennomeres. Maxillary palpi slender, 1.1 times as long as pronotum in midline, 0.9 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.1–1.2, palpomere 4 almost symmetrical. Mentum without microsculpture, punctures obsolete.

Thorax: Pronotal ground punctation as on head, systematic punctures moderately distinct. Elytral ground punctation slightly stronger than on head and pronotum, interspaces about two times as wide as punctures; systematic punctures very indistinct, mesal rows strongly reduced in number, not reaching anterior margin, additional coarse punctures present on lateral portion of elytra. Mesoventrite with low mesal carina.

Femora (Fig. 88): Pubescence present on less than proximal 2/3 of pro- and mesofemur, on proximal half of metafemur, hairlines oblique.

Abdomen: Ventrite 5 weakly sclerotized with very flat apical emargination, ca. 10 µm deep.

Aedeagus (Fig. 149): Length: 0.35–0.38 mm. Phallobase distinctly shorter than parameres, about as long as wide, bending rectangularly to short, wide manubrium; border between pigmented and unpigmented portion of ventral face indistinct, extending into proximal third of phallobase. Parameres wide basally; lateral margins with strong subapical incision; mesal margin abruptly narrowing at midlength; apex obliquely flattened with blunt lateral projection; dorsal face extending weakly into phallobase; ventral face distinctly shorter than dorsal face. Median lobe wide basally, dorsal face abruptly narrowing at midlength, apex exceeding apex of parameres; ventral face distinctly wider than dorsal face; styli absent; reinforcing semilunar plate present at midlength; corona situated subapically; basal apophyses long, slightly bending laterad, extending to midlength of phallobase.

ECOLOGY: Most specimens were collected at light, together with *A. angustipennis* and *A. ceylonensis*; four specimens were collected in a stream draining a swamp (BRINCK et al. 1971: “Loc. 16: I”). They were found at elevations between 30 and 150 m a.s.l.

DISTRIBUTION (Fig. 156): Sri Lanka (Sabaragamuwa Province, Western Province).

ETYMOLOGY: The name refers to Taprobane, ancient name for Sri Lanka.

Agraphydrus tumulosus sp.n.

TYPE LOCALITY: India, Kerala, Pathanamthitta District, Cardamom Hills, 50 km NW Pathanamthitta, Pambaiyar River, 77°5'E 9°25'N.

TYPE MATERIAL: **Holotype** ♂ (NMW): “INDIA: Kerala \ Cardamom Hills \ 50 km NW Pathanamthitta \ Pambaiyar river | 300 m, 6.–9.5.1994 \ 77°05'E, 09°25'N \ at light \ leg. Z. Kejval”. **Paratypes**: 10 exs. (NMW): same sampling data.

DIFFERENTIAL DIAGNOSIS: Shares strongly convex habitus, nine-segmented antennae, unicolored palpomeres, absence of clypeal microsculpture, coarse ground punctation, extension of femoral pubescence, and absence of emargination on ventrite 5 with *A. inflatus*, *A. rostratus*, *A. rugosus*, and *A. uvaensis*; differs in minor size and equal, less coarse ground punctation of pronotum and elytra from *A. rugosus* and *A. uvaensis*.

DESCRIPTION: Total length: 1.9–2.2 mm; elytral width: 1.0–1.2 mm; E.I.: 1.3, P.I.: 2.0–2.1, elytra 2.8 times as long as pronotum. Habitus (Fig. 43) slender, evenly oval, strongly convex.

Coloration: Labrum light brown, clypeus dark brown with yellowish preocular patches about as wide as diameter of eye; frons black; maxillary palpi unicolored yellow; pronotum black, with indistinct undefined narrow yellowish lateral margins; elytra dark brown to black; ventrites and legs light to dark brown.

Head: Clypeus with weakly concave anterior margin, C.I.: 4.3, lateral length ratio clypeus/eyes = 1.4–1.5; microreticulation absent, ground punctures coarse, distinctly impressed, interspaces 1–2 times as wide as punctures, systematic punctures distinct. Eyes large, not protruding, spherical. Antennae with nine antennomeres. Maxillary palpi moderately stout, 0.8–0.9 times as long as pronotum in midline, 0.9 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 0.9, palpomere 4 almost symmetrical. Mentum with very fine, widely separated punctures, without microsculpture.

Thorax: Pronotal ground punctation as on head, systematic punctures distinct. Elytral ground punctation slightly stronger than on head and on pronotum, interspaces 1–2 times as wide as punctures; four rows of systematic punctures indistinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with distinct mesal bulge and very low crescent-shaped ridge postero-mesally.

Femora (Fig. 89): Pubescence present on proximal 2/3 of femora, hairlines straight.

Abdomen: Ventrite 5 without apical emargination.

Aedeagus (Fig. 150): Length: 0.29–0.30 mm. Phallobase distinctly shorter than parameres, slightly wider than long, abruptly bending to long narrow spine-like manubrium; border between pigmented and unpigmented portion of ventral face indistinct. Parameres slightly wider at base than on apex, widest at midlength; lateral margin with distinct subapical constriction; apex with large, blunt lateral extension and blunt mesal corner; dorsal face reaching midlength of phallobase mesally. Median lobe wide basally; dorsal face evenly converging to narrowly rounded apex; ventral face very short and wide; apex not reaching apex of parameres; corona moderately large, situated in basal fourth; basal apophyses long, widely separated, reaching distal third of phallobase.

ECOLOGY: The specimens were collected at light, near a river, at 300 m a.s.l.

DISTRIBUTION (Fig. 155): India (Kerala).

ETYMOLOGY: The name *tumulosus* (Lat.) (= hilly) refers to the Cardamom Hills (India, Kerala), where the type specimens were collected.

Agraphydrus uvaensis HEBAUER, 2000

Megagraphydrus uvaensis HEBAUER 2000b: 17.

Agraphydrus uvaensis (HEBAUER): MINOSHIMA et al. 2015: 36.

TYPE LOCALITY: Sri Lanka, Uva Province, Gampaha Estate, ca. 14.5 km W Badulla.

TYPE MATERIAL: **Holotype** ♀ (ZML): “Ceylon, Prov. of Uva \ Gampaha Estate \ 9 mls W Badulla \ 14.III.{19}62, Loc. 145 | in small stream \ coming down in cascades | Lund University \ Ceylon Expedition 1962 \

Brinck – Andersson - \ Cederholm | ZML 2010 \ 221 | MZL \ 2015 \ 274 | MZLU Type no. 3060:1 | Holotypus \ *Megagrphydrus \ uvaensis* sp. n. \ des. F. Hebauer[†]. **Paratype** ♀ (NMW): Uva Prov., Badulla Distr., 2 miles NW Haldumulla, 1100 m a.s.l., stream, cascade, 2.III.1962, leg. P. Brinck, H. Andersson, L. Cederholm “Loc. 111”.

DIFFERENTIAL DIAGNOSIS: Shares nine-segmented antennae, unicolored palpomeres, absence of clypeal microsculpture, coarse ground punctation, extended femoral pubescence, and absence of emargination on ventrite 5 with *A. inflatus*, *A. rostratus*, *A. rugosus*, and *A. tumulosus*; shares large size and small interspaces of elytral ground punctures with *A. rugosus*. Differs from all other species of *Agraphydrus* known so far in presence of ten, more or less regular rows of elytral punctures.

DESCRIPTION: Total length: 3.0 mm; elytral width: 1.4 mm; E.I.: 1.3, P.I.: 2.0–2.1, elytra 2.9–3.1 times as long as pronotum. Habitus (Fig. 44) moderately broad, elytra very weakly widening posterior of midlength, strongly convex.

Coloration: Labrum, clypeus and frons black, clypeus with distinct yellow preocular patches, less wide than eye; maxillary palpi unicolored yellow; pronotum largely dark brown to black with narrow yellow lateral margins; elytra dark brown with undefined yellowish lateral margins and posterior portion; ventrites and legs dark brown to black; femora with brighter distal portions.

Head: Clypeus with distinctly concave anterior margin, C.I.: 4.1, lateral length ratio clypeus/eyes = 1.6, microsculpture absent, ground punctures coarse, distinctly impressed, interspaces about as wide as punctures or sometimes slightly wider, systematic punctures distinct. Eyes large, slightly protruding, slightly oblong. Antennae with nine antennomeres. Maxillary palpi stout, 0.8 times as long as pronotum in midline, 0.8 times as long as maximum width of clypeus, length ratio of palpomeres 4:3 = 1.1, palpomere 2 strongly club-shaped, palpomere 4 almost symmetrical. Mentum with few very fine punctures, microsculpture absent.

Thorax: Pronotal ground punctation slightly finer than on head, interspaces two times as wide as punctures, systematic punctures distinct. Elytral ground punctation slightly stronger than on pronotum, interspaces 1–2 times as wide as punctures, punctures with serial arrangement present among unordered punctures; four rows of systematic punctures very indistinct, mesal rows strongly reduced in number, not reaching anterior margin. Mesoventrite with low bulge abruptly sloping posteriorly.

Femora (Fig. 90): Pubescence present on proximal 2/3 of profemur, slightly more extended on meso- and metafemur than on profemur; hairlines straight.

Abdomen: Ventrite 5 without emargination.

Aedeagus unknown.

ECOLOGY: The specimens were found in streams, between 1100 and 1760 m a.s.l.

DISTRIBUTION (Fig. 156): Sri Lanka (Uva Province)

Key to the *Agraphydrus* species of the Indian Subcontinent

- 1 Clypeus shagreened, at least on narrow rim along anterior margin or anterior to frontoclypeal suture 2
- Clypeus not shagreened (except at a small area at anterolateral corner in some species) 18
- 2 Maxillary palpomere 4 infuscated apically (Fig. 92); aedeagus (Fig. 106) **andamanicus**
- Maxillary palpomere 4 not infuscated apically 3
- 3 Clypeus totally or almost totally shagreened, rarely shagreenation restricted to anterior half 4
- Shagreenation of clypeus restricted to a rim along anterior (and sometimes lateral) margin or to a narrow band anterior to frontoclypeal suture 12

4	Pronotum and elytra unicolored yellow.....	5
–	Pronotum and elytra dark brown or black, unicolored, or with bright brown or yellowish brown areas in some species (<i>A. obscuratus</i> , <i>A. connexus</i>).....	7
5	Antennae with eight antennomeres; parameres broadly rounded apically (aedeagus: Fig. 124)..	<i>gilvus</i>
–	Antennae with nine antennomeres; parameres with apical projections	6
6	Habitus slender; apex of parameres and median lobe very narrow (aedeagus: Fig. 108).....	<i>annapurnensis</i>
–	Habitus moderately broad; apex of parameres and median lobe wide (aedeagus: Fig. 122).....	<i>flavonotus</i>
7	Body length 2.8–3.0 mm; ground punctures coarse on pronotum, very coarse on elytra (Fig. 16); maxillary palpi 0.9 times as long as pronotum in midline, palpomere 4 as long as palpomere 3 (Fig. 98); abdominal ventrite 5 not emarginate apically; aedeagus: Fig. 123.....	<i>fortis</i>
–	Body length 1.9–2.6 mm; ground punctures fine to very fine, equal on pronotum and elytra (Figs. 6, 24, 27, 31); maxillary palpi as long as pronotum in midline or longer; palpomere 4 longer than palpomere 3 (Figs. 94, 97, 100–101, 103); abdominal ventrite 5 emarginate apically.....	8
8	Habitus (Fig. 27) broad (E.I.: 1.2); pronotum very wide (P.I.: 2.3); clypeus dark yellow with mesal infuscation; maxillary palpomeres as long as pronotum in midline, palpomere 4 slightly longer than palpomere 3 (Fig. 101); aedeagus (Fig. 134): 0.37–0.44 mm long	<i>meghalayanus</i>
–	Habitus (Figs. 6, 24, 31) moderately broad or slender (E.I.: 1.3–1.4); pronotum moderately wide (P.I.: 2.0–2.1); clypeus black with yellow preocular patches; maxillary palpomeres 1.1–1.2 times as long as pronotum in midline, palpomere 4 distinctly longer than palpomere 3 (Figs. 94, 97, 100, 103); aedeagus (Figs. 110, 116, 131, 138) 0.25–0.32 mm long	9
9	Pronotum and elytra entirely black with narrow yellow margins; aedeagus: Fig. 131.....	<i>kempi</i> (partim)
–	Pronotum and elytra light to dark brown.....	10
10	Parameres distinctly connected with base of median lobe by distinct median extension (Fig. 116).....	<i>connexus</i>
–	Parameres not distinctly connected with base of median lobe by a median extension (Figs. 110, 138).....	11
11	Apex of parameres straight, not distinctly inflated (Fig. 138).....	<i>obscuratus</i>
–	Apex of parameres distinctly inflated (Fig. 110).....	<i>bhutanicus</i>
12	Microsculpture present on very narrow band anterior to frontoclypeal suture, absent from anterior margin; habitus (Fig. 28) broad (E.I.: 1.1); ground punctures coarse; maxillary palpi (Fig. 102) 0.9 times as long as pronotum in midline; mesoventrite with short posteromedian carina; aedeagus (Fig. 135) 0.52 mm long, apex of parameres with sharply pointed lateral extension.....	<i>montanus</i>
–	Microsculpture on clypeus present along anterior margin (mesally interrupted in some specimens of <i>A. communis</i>), absent from posterior margin; habitus (Figs. 10, 12, 24, 33–34, 41) slender to moderately broad (E.I.: 1.3–1.4); ground punctures fine; maxillary palpi (Figs. 100, 104) 1.1–1.2 times as long as pronotum in midline; mesoventrite without carina; aedeagus 0.23–0.37 mm long, apex of parameres with blunt lateral extension, or extension absent (Figs. 114–115, 119, 131, 140–141, 148).....	13
13	Median lobe very wide, globular	14
–	Median lobe not globular.....	15
14	Apex of parameres without extension (Fig. 140)	<i>pauculus</i>
–	Apex of parameres with large blunt lateral extension (Fig. 119)	<i>crassipennis</i>

- 15 Basal apophyses of median lobe moderately long, strongly curving laterad (Fig. 148)..... *stagnalis*
 – Basal apophyses of median lobe very short, straight, not curving laterad..... 16
- 16 Apex of parameres with strong lateral extension (Fig. 141)..... *protentus*
 – Apex of parameres inflated, extension absent 17
- 17 Pronotum and elytra deep black, shiny; shagreenation of clypeus distinctly impressed at anterior margin, vanishing posteriorly; parameres with strongly sigmoid margins, median lobe distinctly shorter than parameres (Fig. 131) *kempi* (partim)
 – Pronotum and elytra dark brown or black with brighter brown areas; anterior margin of clypeus very narrowly shagreened, with median interruption in many cases; parameres with weakly sigmoid margins, median lobe as long as parameres or slightly shorter (Figs. 114–115) *communis*
- 18 Metafemoral pubescence absent or, if present, not covering entire proximal half 19
 – Metafemur pubescent at least on entire proximal half..... 34
- 19 Maxillary palpomere 4 without apical infuscation 20
 – Maxillary palpomere 4 with apical infuscation 23
- 20 Antennae with nine antennomeres; maxillary palpi (Figs. 93, 96) 0.9 times as long as pronotum in midline; palpomere 4 not longer than palpomere 3; mesoventrite carinate posteriorly; abdominal ventrite 5 without apical emargination; Sri Lanka 21
 – Antennae with eight antennomeres; maxillary palpi (Figs. 95, 99) as long as pronotum in midline or slightly longer, palpomere 4 longer than palpomere 3; mesoventrite without carina; abdominal ventrite 5 with or without apical emargination; India, Nepal 22
- 21 Head, pronotum and elytra ferrugineous; clypeus with distinct yellow preocular patches; body length: 2.0 mm; aedeagus: Fig. 112..... *ceylonensis*
 – Head, pronotum and elytra black; clypeus unicolored black or with very narrowly yellowish lateral margins; body length: 2.4 mm; aedeagus: Fig. 107 *angustipennis*
- 22 Abdominal ventrite 5 with apical emargination; aedeagus: Fig. 111 *boukali*
 – Abdominal ventrite 5 without apical emargination; aedeagus: Fig. 128 *indicus* (partim)
- 23 Elytra parallel-sided or slightly widening behind midlength (Figs. 18, 29); mesofemoral pubescence present on proximal fourth (Figs. 64, 75)..... 24
 – Elytra evenly oval (Figs. 14, 21, 23, 25, 30, 32, 35–36, 40); mesofemoral pubescence present on proximal third to half (Figs. 60, 67, 69, 71, 76, 78, 81–82, 86) 25
- 24 Pronotum and elytra largely yellow (Fig. 29), mesal infuscation present or absent; mesoventrite carinate; body length 1.4–1.5 mm; aedeagus: Fig. 136 *nanus*
 – Pronotum and elytra largely black (Fig. 18); mesoventrite without carina; body length 1.9 mm; aedeagus: Fig. 125 *glaber*
- 25 Abdominal ventrite 5 with apical emargination 26
 – Abdominal ventrite 5 without apical emargination 31
- 26 Pronotum with wide yellowish brown margins; parameres sickle-shaped (Fig. 121)..... *falcatus*
 – Pronotum largely dark brown or black; parameres not sickle-shaped 27
- 27 Ground punctures on head obsolete..... *obsoletus*
 – Ground punctures on head fine or very fine 28
- 28 Aedeagus 0.48 mm long, basal lobe more than twice as long as parameres (Fig. 142) *pullus*
 – Aedeagus 0.24–0.34 mm long, basal lobe at most as long as parameres 29
- 29 Basal lobe of aedeagus about as long as parameres (Fig. 130)..... *kallar*
 – Basal lobe of aedeagus shorter than parameres (Figs. 128, 143)..... 30

- 30 Mesofemoral pubescence present on proximal half; median lobe without styli, with shield-shaped structure (Fig. 128) *indicus* (partim)
- Mesofemoral pubescence present on proximal third; median lobe with styli, shield-shaped structure absent (Fig. 143) *punctulatus*
- 31 Pronotum and elytra black; median lobe with narrow shield-shaped structure or with styli (Figs. 128, 137)..... 32
- Pronotum and elytra yellowish or dark brown; median lobe with large reinforcing plate (Figs. 132, 147)..... 33
- 32 Median lobe without styli, with shield-shaped structure (Fig. 128) *indicus* (partim)
- Median lobe with styli, without shield-shaped structure (Fig. 137) *nepalensis*
- 33 Habitus (Fig. 40) moderately convex; ground punctures fine; mesoventrite carinate; aedeagus: Fig. 147 *sipekorum*
- Habitus (Fig. 25) strongly convex; ground punctures moderately coarse; mesoventrite not carinate; aedeagus: Fig. 132 *khasiensis*
- 34 Maxillary palpomere 4 with apical infuscation 35
- Maxillary palpomere 4 without apical infuscation 41
- 35 Mesoventrite with median carina; metafemoral pubescence present on proximal half (Figs. 45, 88)..... 36
- Mesoventrite without carina; metafemoral pubescence present on proximal 2/3–3/4 (Figs. 49, 53, 56–57, 65)..... 37
- 36 Antennae with eight antennomeres; abdominal ventrite 5 with apical emargination; apex of parameres with blunt lateral projection, median lobe with semilunar plate (Fig. 149).....
- *taprobanensis*
- Antennae with nine antennomeres; abdominal ventrite 5 without apical emargination; apex of parameres duck-shaped, median lobe bottle-shaped without semilunar plate (Fig. 105)..... *anatinus*
- 37 Elytra black (Fig. 5); ground punctures coarse; metafemoral pubescence (Fig. 49) present on proximal 3/4; apex of parameres angularly bending mesad (Fig. 109) *ater*
- Elytra light brown or yellow (Figs. 9, 11, 19); ground punctures on pronotum and elytra coarse or fine; metafemoral pubescence (Figs. 53, 56–57, 65) present on proximal 2/3; apex of parameres not angularly bending mesad (Figs. 113, 117–118, 126) 38
- 38 Ground punctures coarse; length ratio palpi/pronotum in midline = 1.4, apex of parameres pointed (Fig. 113) *cinnamum*
- Ground punctures fine; length ratio palpi/pronotum in midline = 1.0–1.2; apex of parameres not pointed (Figs. 117–118, 126)..... 39
- 39 Parameres strongly constricted subapically (Fig. 117)..... *constrictus*
- Parameres not strongly constricted subapically (Figs. 118, 126) 40
- 40 Parameres wide basally (Fig. 126)..... *heinrichi*
- Parameres narrow basally (Fig. 118) *coomani*
- 41 Habitus (Figs. 13, 26) moderately convex; ground punctures on pronotum and elytra very fine, weakly impressed; head, pronotum and elytra with milky sheen; ventrite 5 with apical emargination 42
- Habitus (Figs. 20, 22, 37–39, 43–44) strongly convex; ground punctures on pronotum and elytra coarse, distinctly impressed; head, pronotum and elytra without milky sheen; ventrite 5 without apical emargination 43
- 42 Body length 2.4 mm; apex of parameres with sharply pointed lateral extension, phallobase slightly less than half as long as parameres (Fig. 120) *exedis*

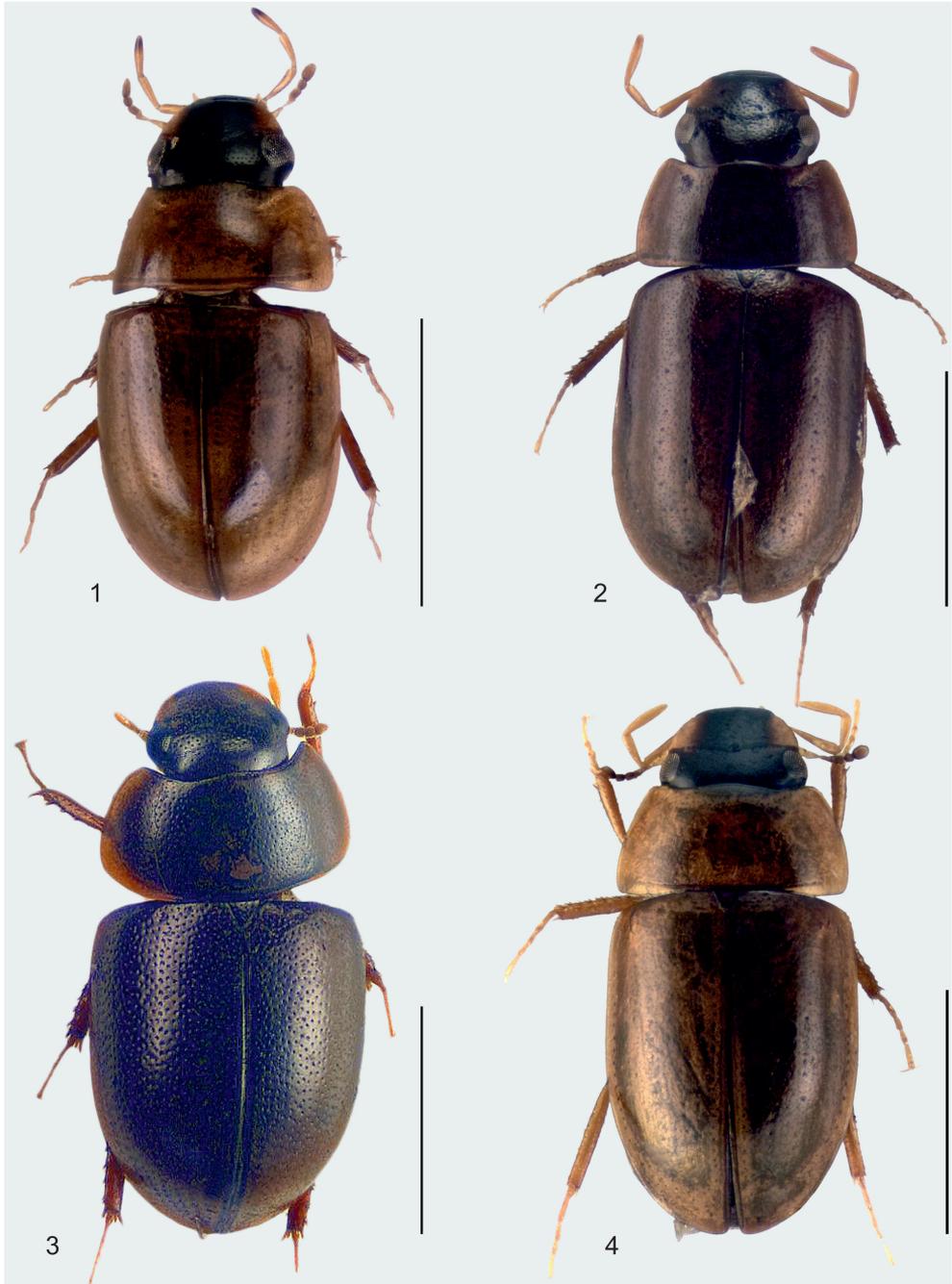
- Body length 2.7–3.1 mm; apex of parameres with blunt lateral extension, phallobase less than 1/3 as long as parameres (Fig. 133)..... *kodaguensis*
- 43 Antennae with eight antennomeres; pronotal and elytral ground punctures equally strong..... 44
- Antennae with nine antennomeres; pronotal punctures finer than elytral punctures..... 45
- 44 Habitus (Fig. 37) very broad; metafemoral pubescence (Fig. 83) present on more than proximal half; apex of parameres without lateral extension (Fig. 144); N-India, Nepal..... *pygmaeus*
- Habitus (Fig. 20) slender to moderately broad; metafemoral pubescence (Fig. 66) on proximal 4/5; apex of parameres with distinct lateral extension (Fig. 127); Sri Lanka..... *hygropetricus*
- 45 Body length 2.8–3.0 mm; interspaces of elytral ground punctures smaller than width of punctures, confluent in apical region..... 46
- Body length 1.9–2.5 mm; interspaces of elytral ground punctures not smaller than width of punctures, not confluent apically..... 47
- 46 Elytral ground punctures with ten regular rows among irregular punctation (Fig. 44)..... *uvaensis*
- Elytral ground punctures not arranged in rows (Figs. 22, 39, 43)..... *rugosus*
- 47 Apex of parameres inflated (Fig. 129)..... *inflatus*
- Apex of parameres not inflated, with lateral extensions (Figs. 145, 150)..... 48
- 48 Basal lobe distinctly shorter than parameres (Fig. 150)..... *tumulosus*
- Basal lobe not shorter than parameres (Fig. 145)..... *rostratus*

Discussion

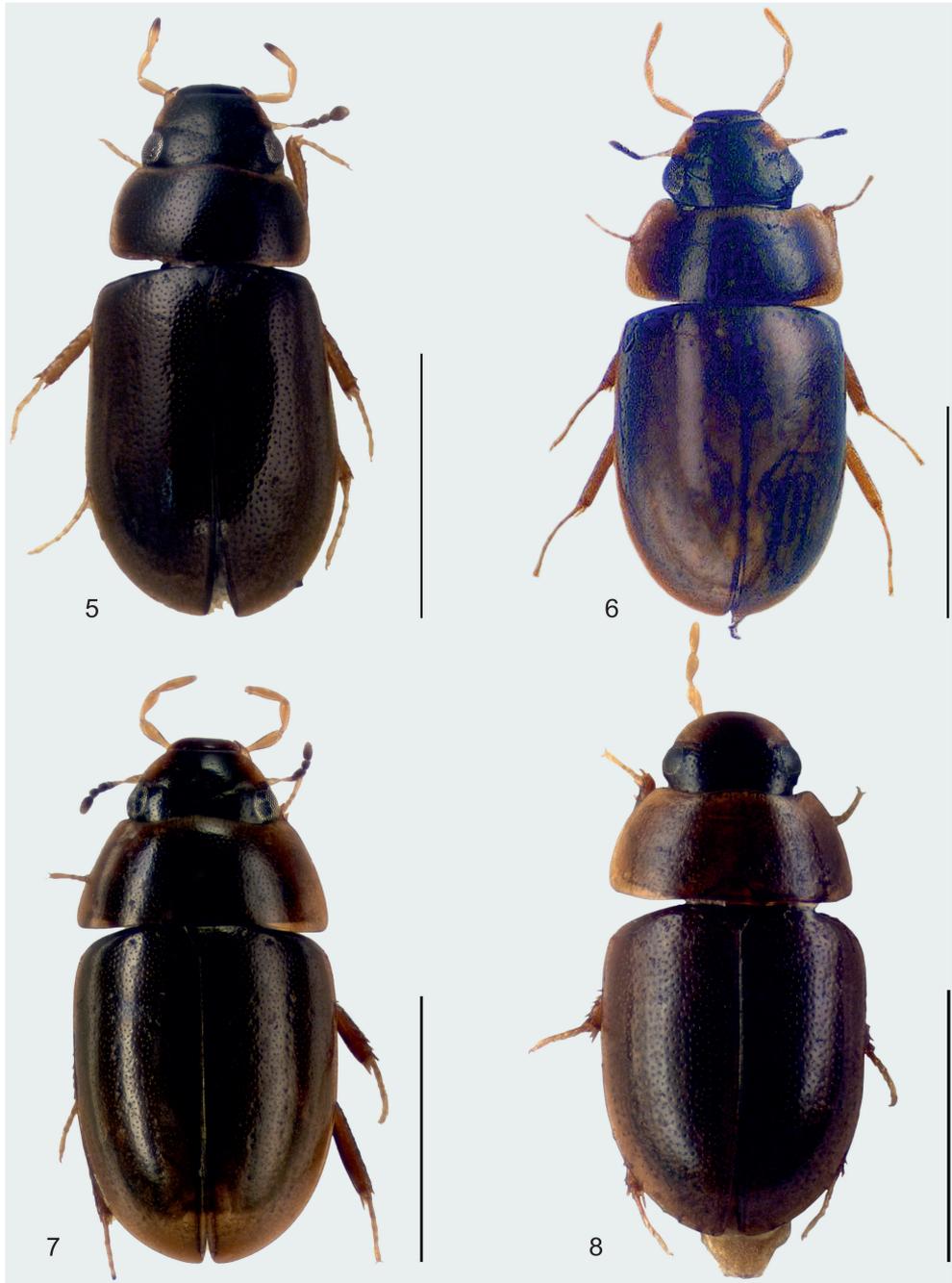
A total of 46 species of *Agraphydrus* is now known from the Indian Subcontinent. It is thus the most speciose hydrophilid genus on the subcontinent. Most of the species treated herein are restricted to the Indian Subcontinent, except two, which are widespread in the Oriental Region: *A. coomani* and *A. connexus*. Seven species are recorded from Sri Lanka, six of them are supposedly endemic. Most of the *Agraphydrus* species found in the Himalaya are restricted to this mountain range and rather widely distributed in Bhutan, Nepal, and the northern states of India; of the fourteen species collected in Nepal, ten occur also in Bhutan and/or in northern India; of the nine species recorded from Bhutan, only *A. bhutanensis* and *A. flavonotus* are restricted to this country. In most sampling localities only one or two species were collected, the maximum number collected in one place were seven (Kali River near Pokhara, Nepal). Thirty-two species are recorded from India, ten of them restricted to one state, reflecting poor exploration rather than restricted distribution areas of these species.

The *Agraphydrus* fauna of India is still very poorly investigated. The genus is known only from 13 of the 36 states and territories, in six of them only one or two localities are known; in Himachal Pradesh and Maharashtra four sampling sites are known, 7–9 in Karnataka, Meghalaya, and Madhya Pradesh, 17 in Tamil Nadu, 32 in Kerala, and 38 in Uttarakhand. No *Agraphydrus* specimens are known from Bangladesh, and only one confirmed record, dating back to the early 20th century, is known from Pakistan. A recent expedition to Bhutan by M.A. Jäch yielded material from ten sampling sites. Nepal with 98 sampling localities, mostly in the Western Region, is comparatively well investigated. Sixteen sampling sites have been examined in Sri Lanka. It can be expected that future collecting activities will distinctly increase the number of species.

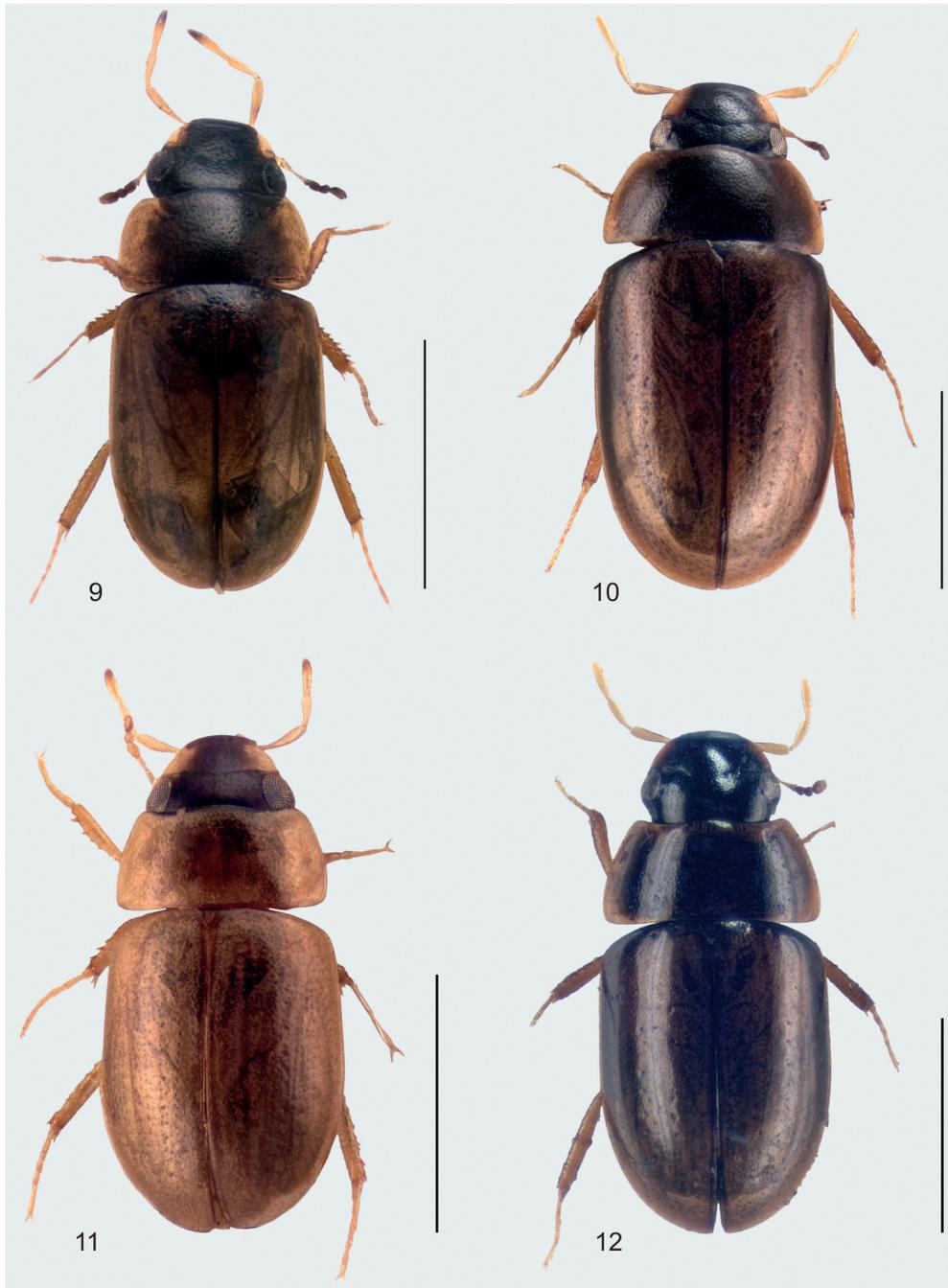
All species are probably aquatic. They were found in rivers, streams, pools, and springs, nine species were collected in hygropetric sites. Ten species were taken at light. The habitats of *A. angustipennis*, *A. khasiensis*, *A. montanus*, and *A. tumulosus* are unknown.



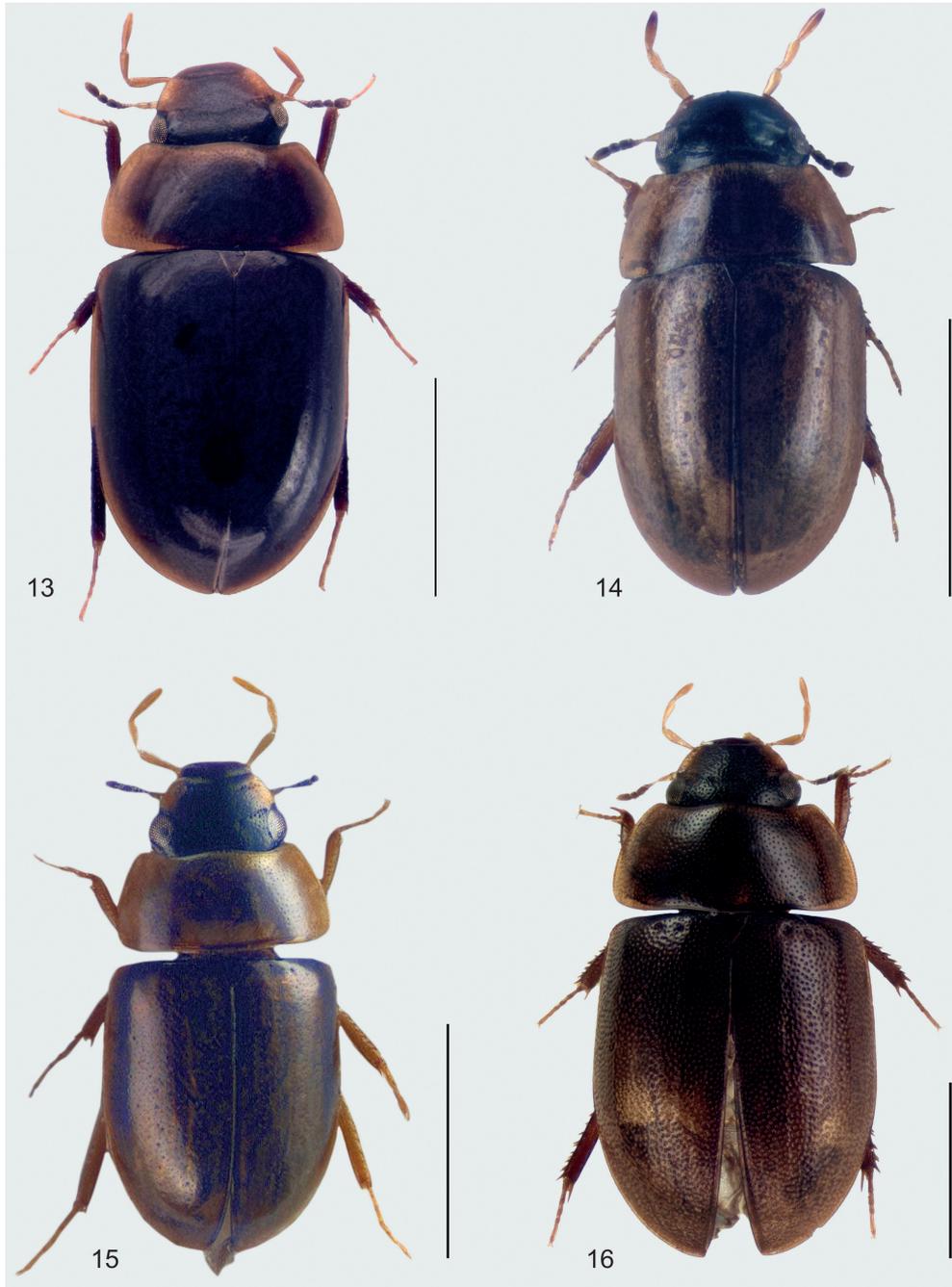
Figs. 1–4: Habitus: 1) *Agropydrus anatinus*, holotype; 2) *A. andamanicus*, holotype; 3) *A. angustipennis*, holotype; 4) *A. annapurnensis*, paratype. Scale = 1 mm.



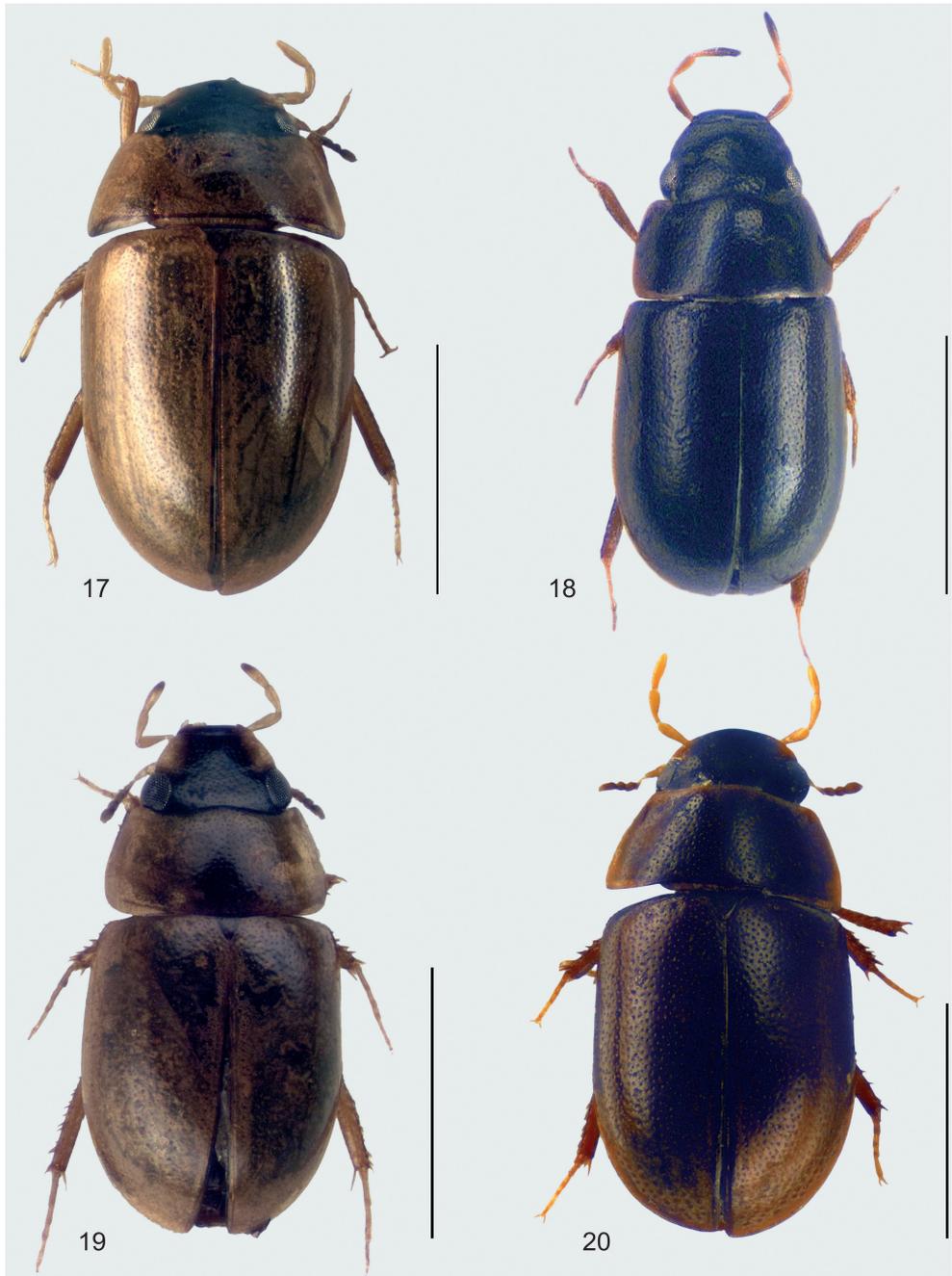
Figs. 5–8: Habitus: 5) *Agraphydrus ater*, paratype; 6) *A. bhutanensis*, paratype; 7) *A. boukali*, paratype; 8) *A. ceylonensis*, holotype. Scale = 1 mm.



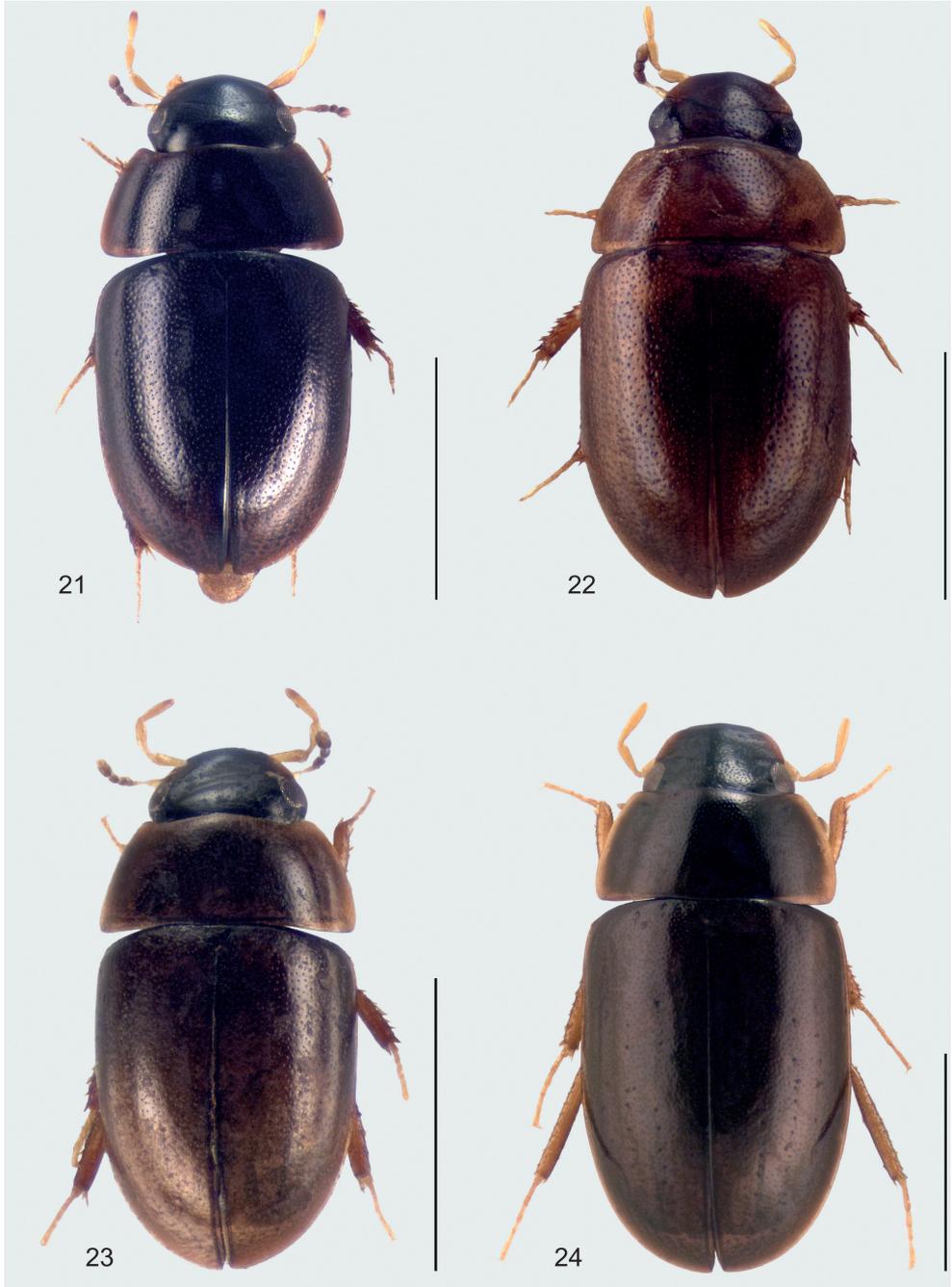
Figs. 9–12: Habitus: 9) *Agraphydrus cinnamum*, holotype; 10) *A. communis*, holotype; 11) *A. constrictus*, paratype; 12) *A. crassipennis*. Scale = 1 mm.



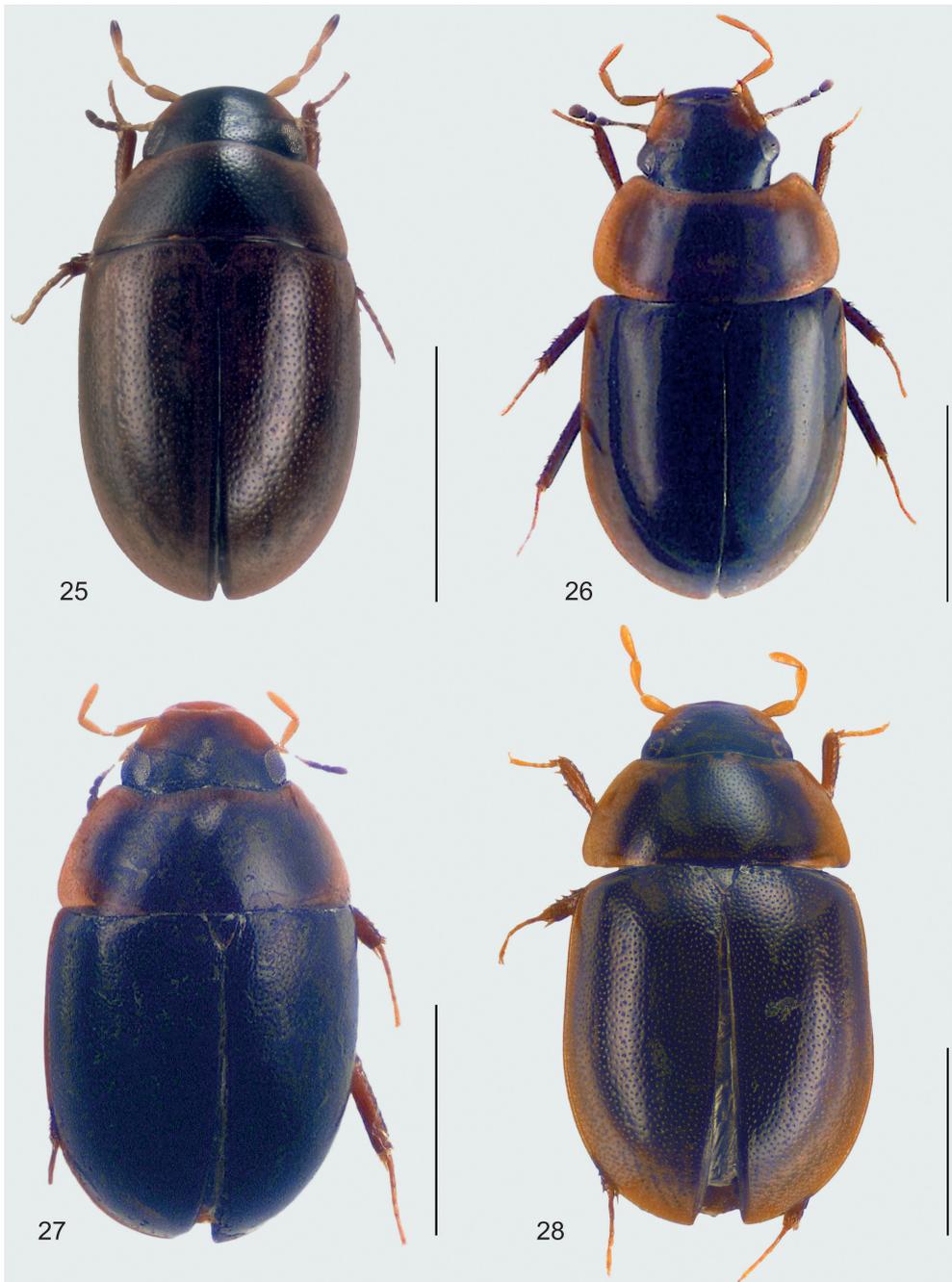
Figs. 13–16: Habitus: 13) *Agraphydrus exedis*, paratype; 14) *A. falcatus*, paratype; 15) *A. flavonotus*, paratype; 16.) *A. fortis*, holotype. Scale = 1 mm.



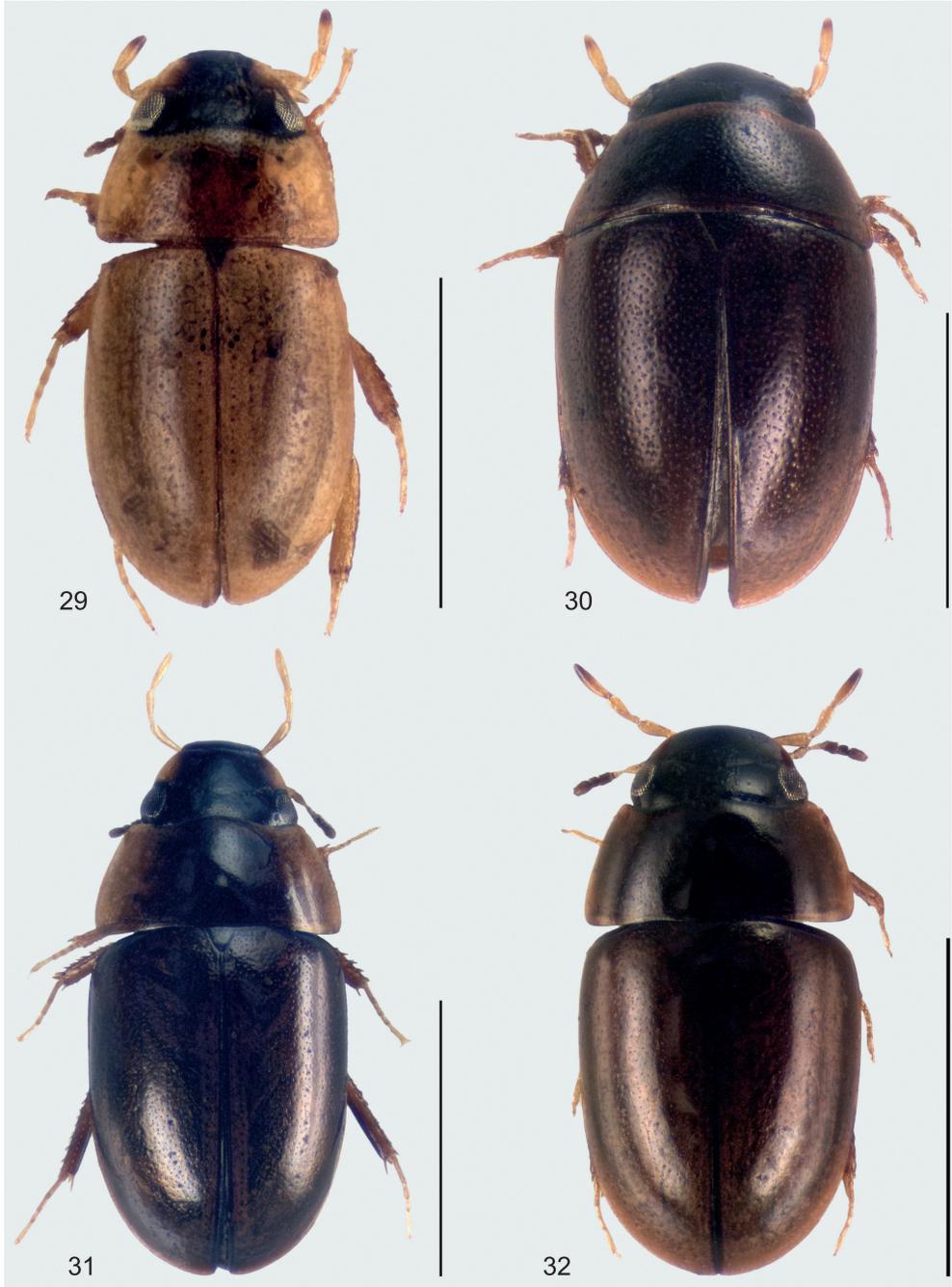
Figs. 17–20: Habitus: 17) *Agraphydrus gilvus*, holotype; 18) *A. glaber*, paratype; 19) *A. heinrichi*, holotype; 20) *A. hygropetricus*, holotype. Scale = 1 mm.



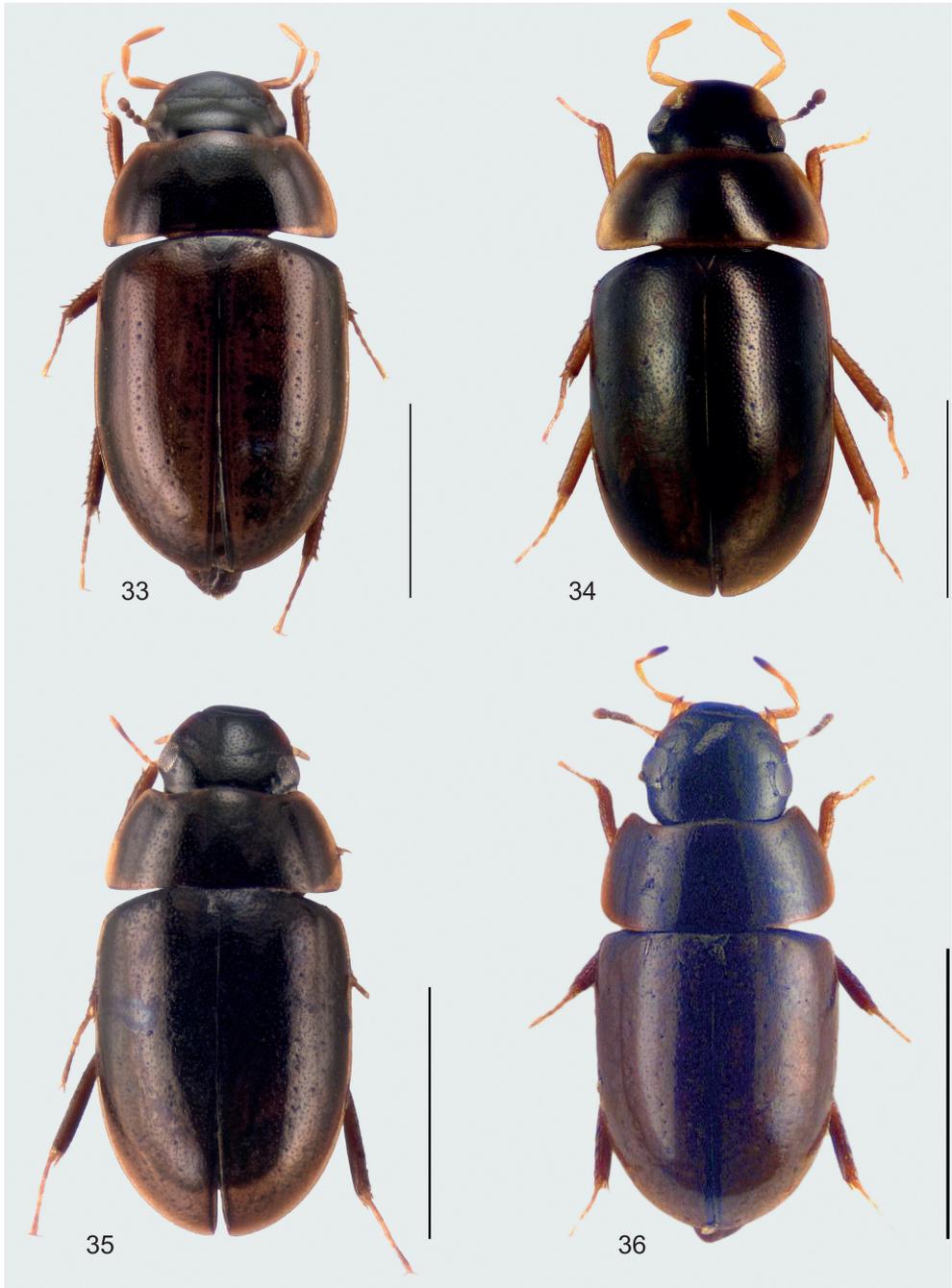
Figs. 21–24: Habitus: 21) *Agraphydrus indicus*; 22) *A. inflatus*; 23) *A. kallari*, paratype; 24) *A. kempi*. Scale = 1 mm.



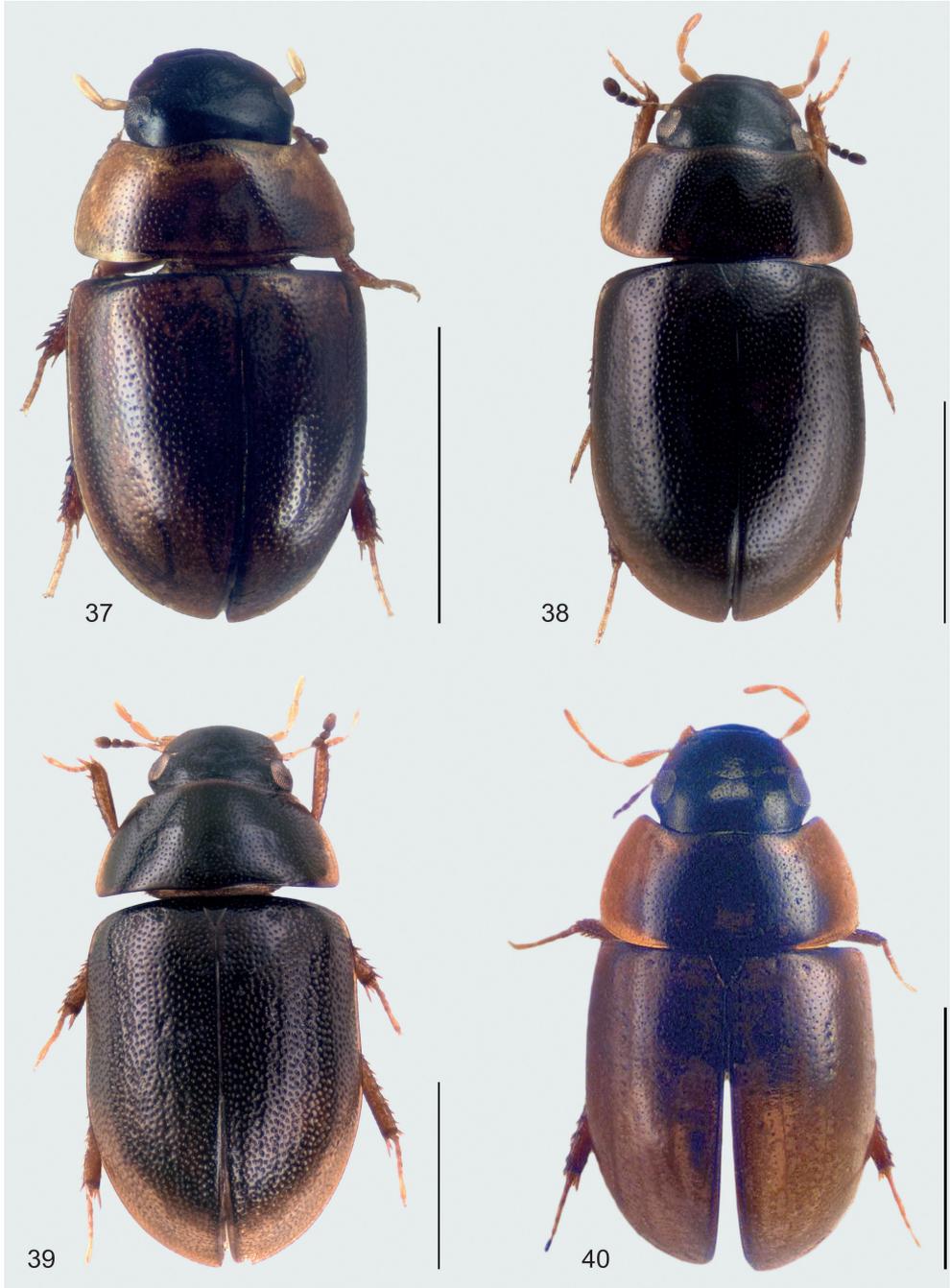
Figs. 25–28: Habitus: 25) *Agraphydrus khasiensis*, holotype; 26) *A. kodaguensis*, paratype; 27) *A. meghalayanus*; 28) *A. montanus*, holotype. Scale = 1 mm.



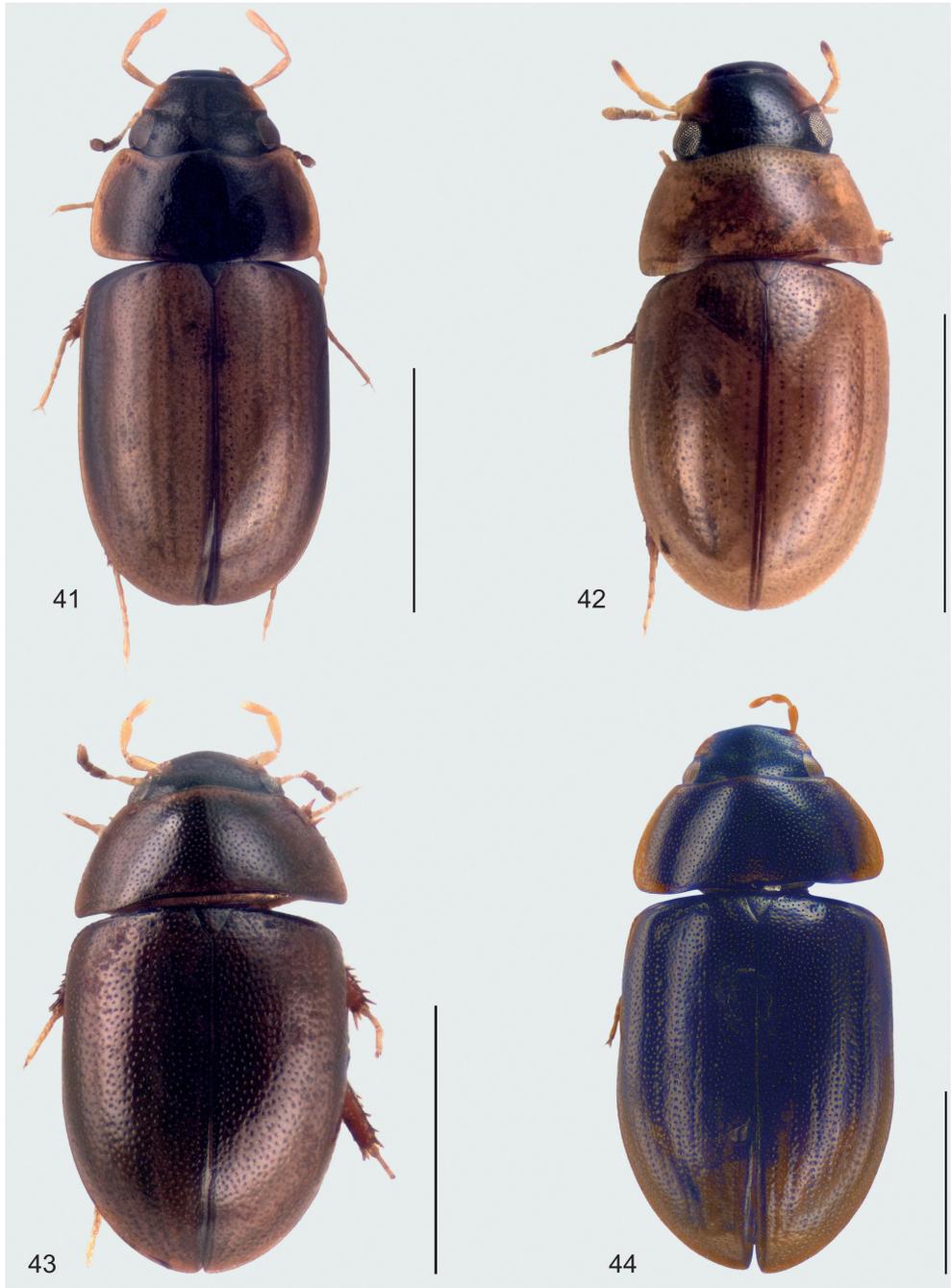
Figs. 29–32: Habitus: 29) *Agraphydrus nanus*, holotype; 30) *A. nepalensis*, paratype; 31) *A. obscuratus*, paratype; 32) *A. obsoletus*, paratype. Scale = 1 mm.



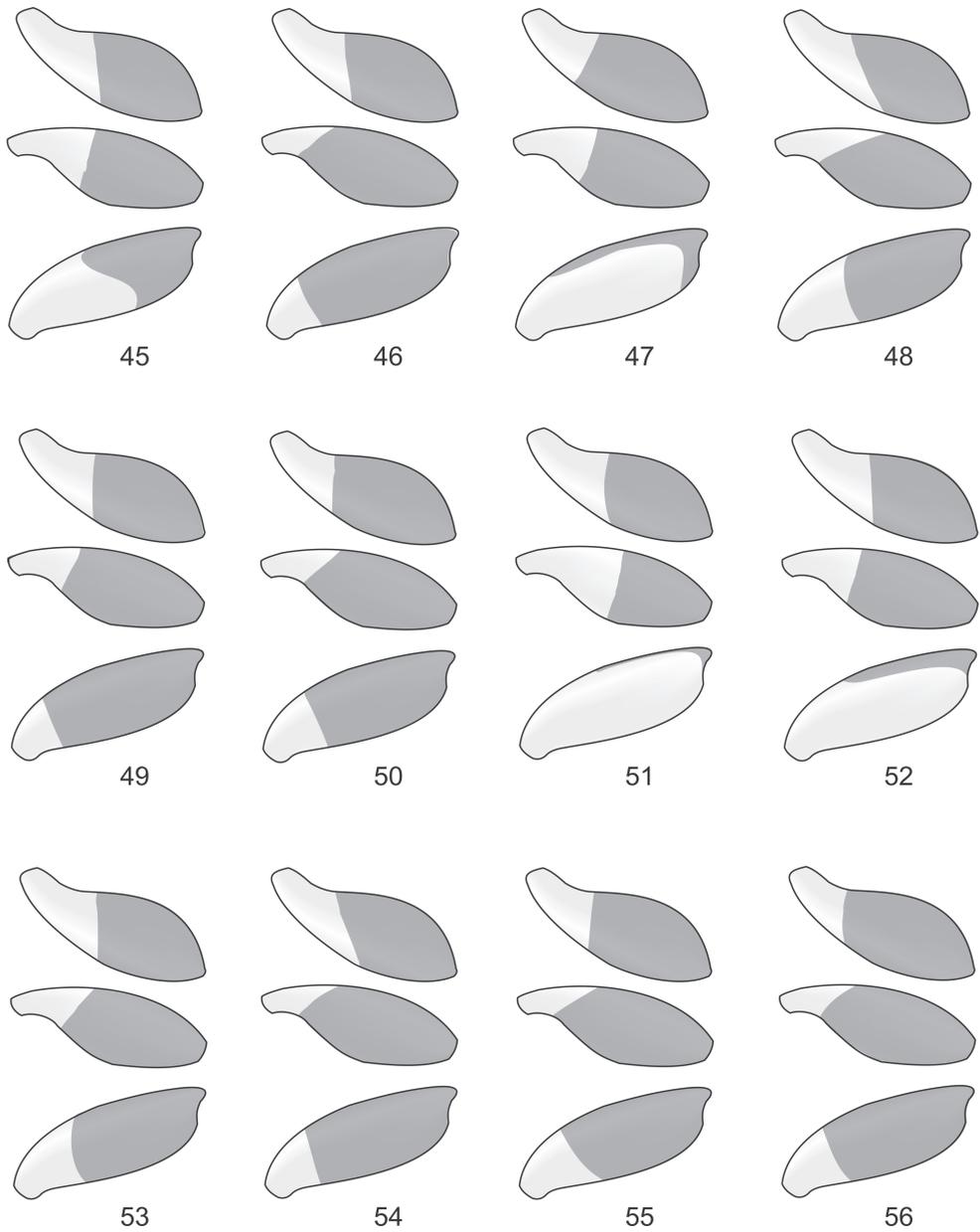
Figs. 33–36: Habitus: 33) *Agraphydrus pauculus*; 34) *A. protentus*, paratype; 35) *A. pullus*, holotype; 36) *A. punctulatus*, paratype. Scale = 1 mm.



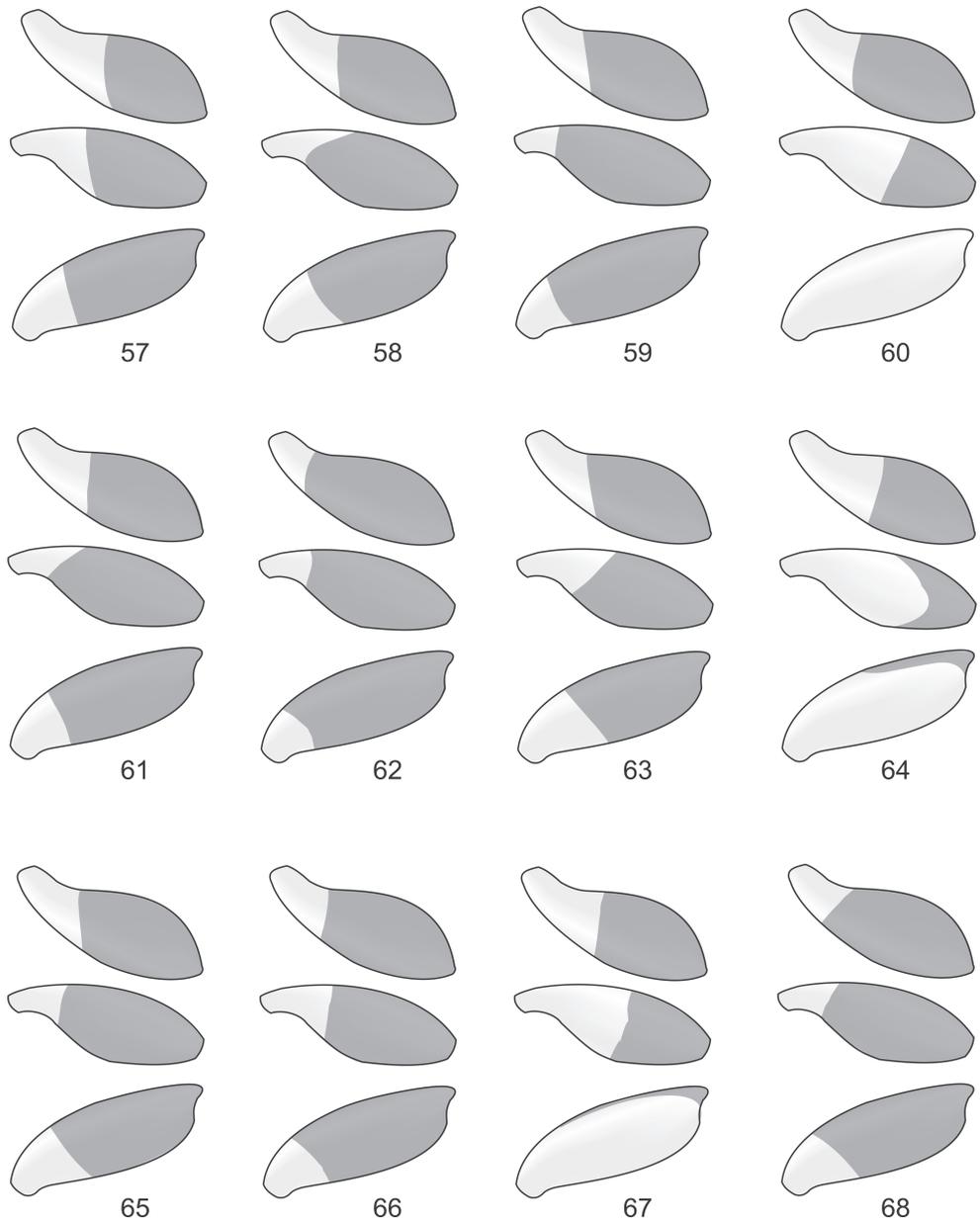
Figs. 37–40: Habitus: 37) *Agraphydrus pygmaeus*; 38) *A. rostratus*, paratype; 39) *A. rugosus*, paratype; 40) *A. sipekorum*, paratype. Scale = 1 mm.



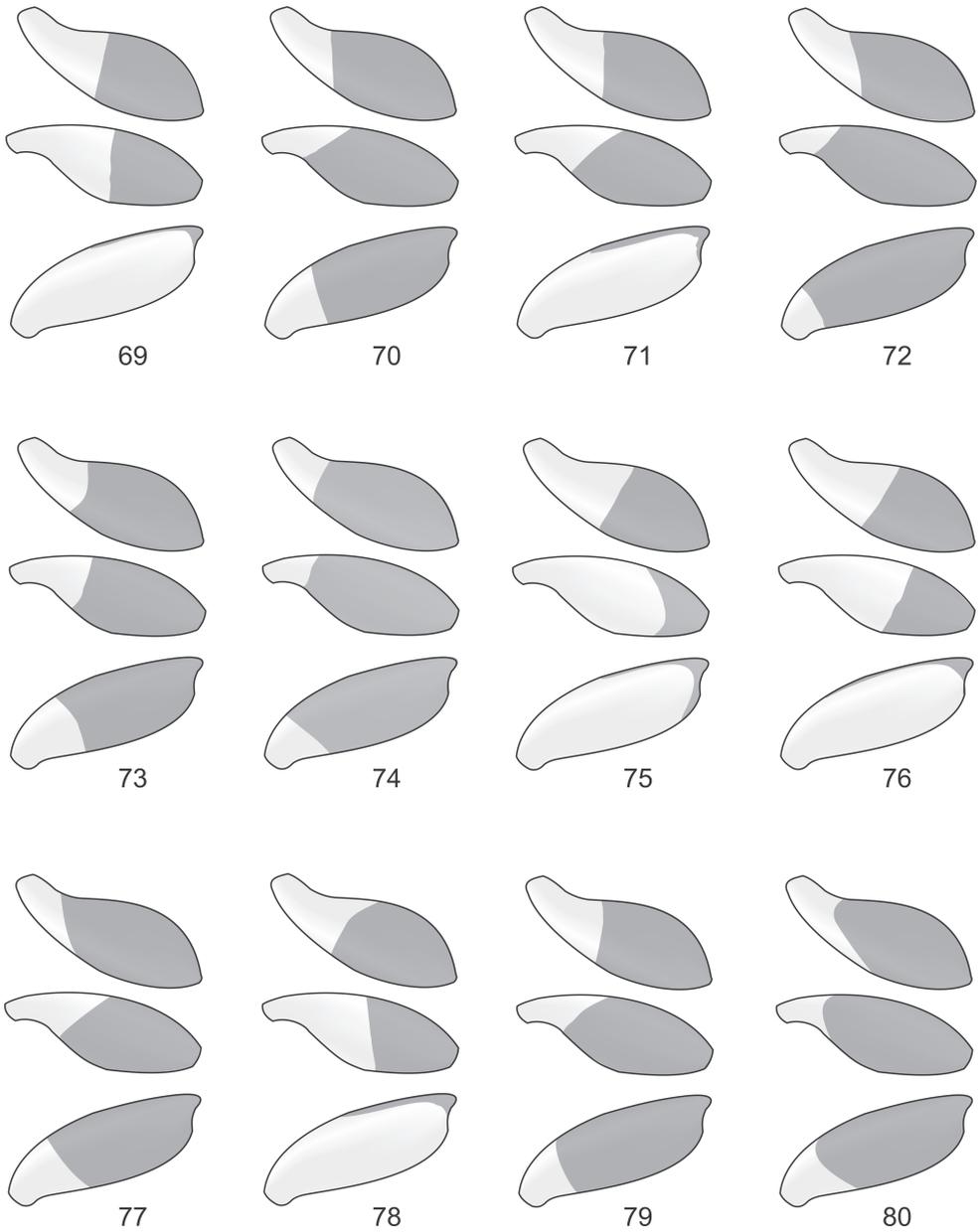
Figs. 41–44: Habitus: 41) *Agraphydrus stagnalis*; 42) *A. taprobanensis*, paratype; 43) *A. tumulosus*, paratype; 44) *A. uvaensis*, holotype. Scale = 1 mm.



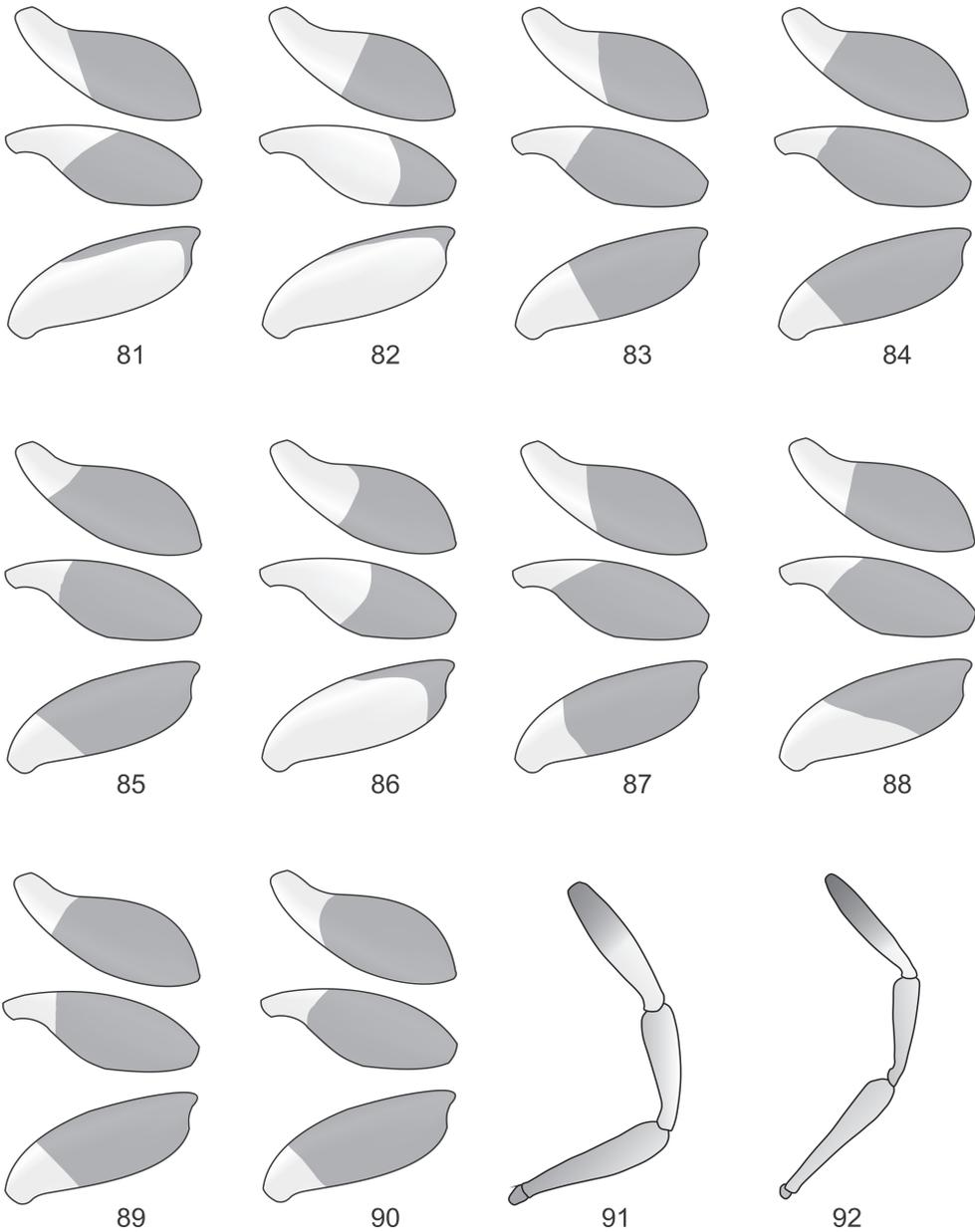
Figs. 45–56: Femora: 45) *Agraphydrus anatinus*; 46) *A. andamanicus*; 47) *A. angustipenis*; 48) *A. annapurnensis*; 49) *A. ater*; 50) *A. bhutanensis*; 51) *A. boukali*; 52) *A. ceylonensis*; 53) *A. cinnamum*; 54) *A. communis*; 55) *A. connexus*; 56) *A. constrictus*.



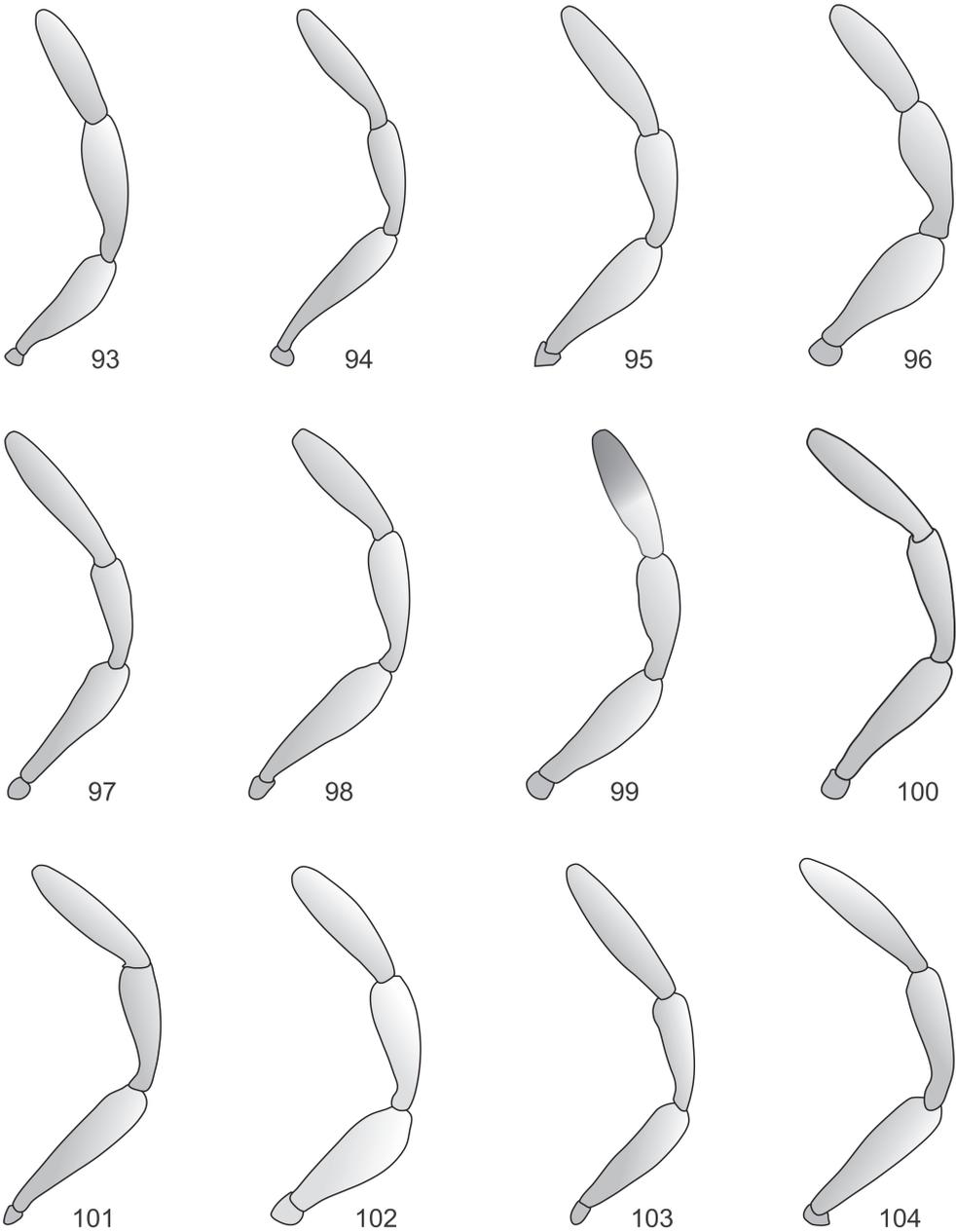
Figs. 57–68: Femora: 57) *Agraphydrus coomani*; 58) *A. crassipenis*; 59) *A. exedis*; 60) *A. falcatus*; 61) *A. flavonotus*; 62) *A. fortis*; 63) *A. gilvus*; 64) *A. glaber*; 65) *A. heinrichi*; 66) *A. hygropetricus*; 67) *A. indicus*; 68) *A. inflatus*.



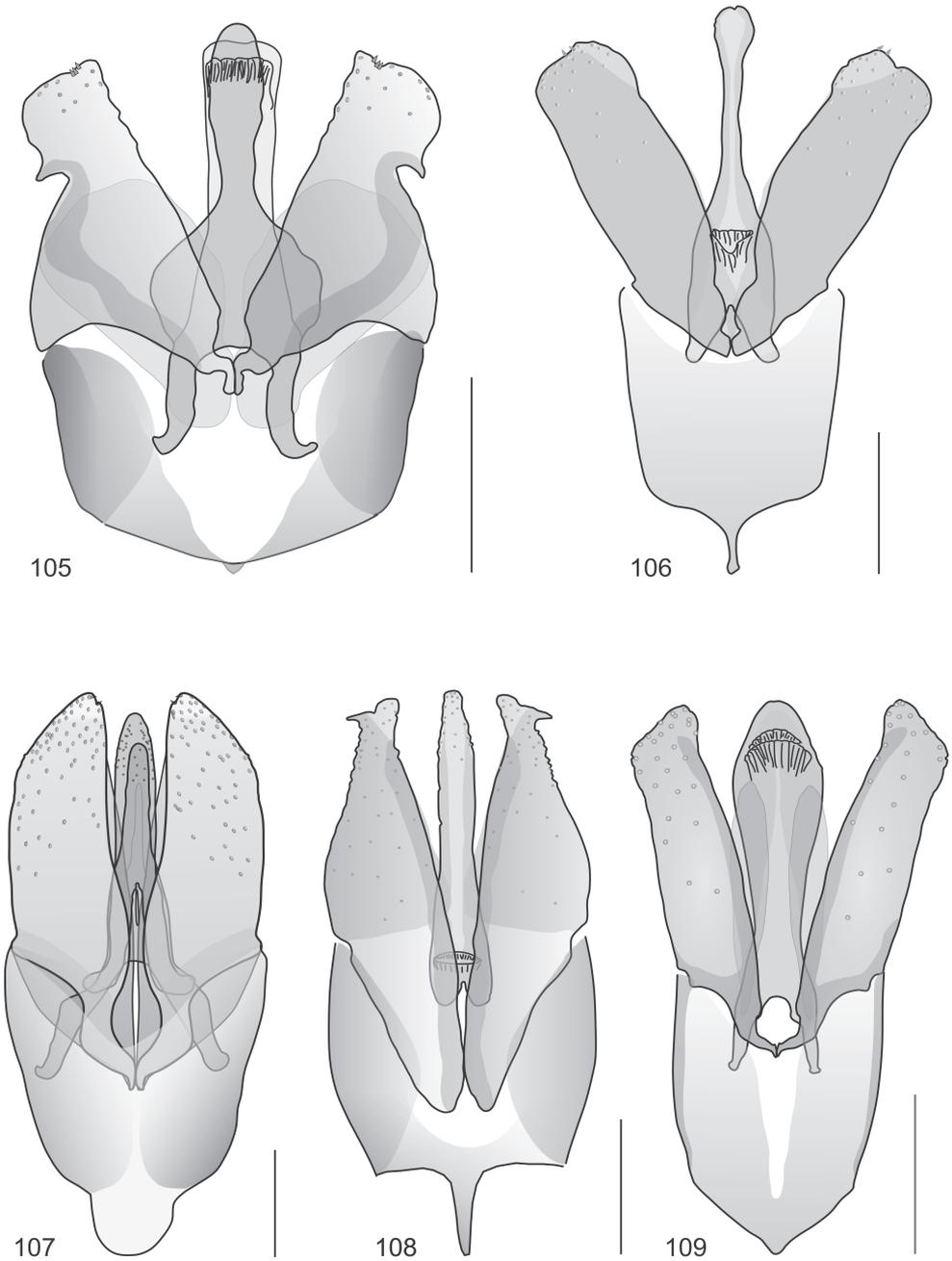
Figs. 69–80: Femora: 69) *Agraphydrus kallari*; 70) *A. kempii*; 71) *A. khasiensis*; 72) *A. kodaguensis*; 73) *A. meghalayanus*; 74) *A. montanus*; 75) *A. nanus*; 76) *A. nepalensis*; 77) *A. obscuratus*; 78) *A. obsoletus*; 79) *A. pauculus*; 80) *A. protentus*.



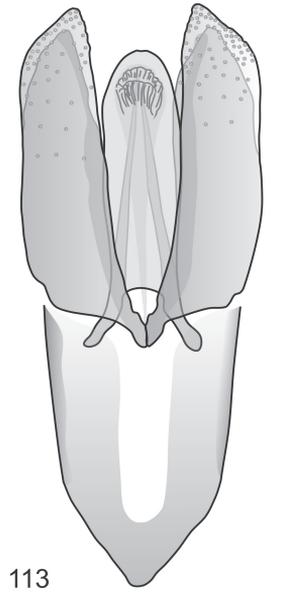
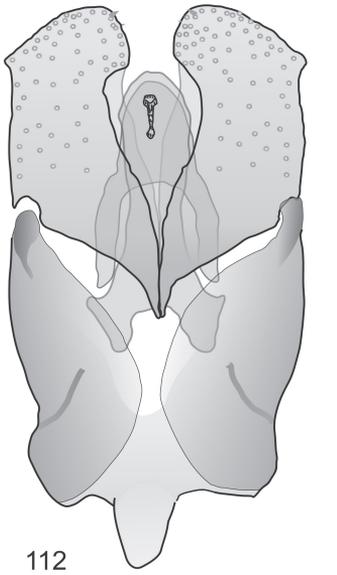
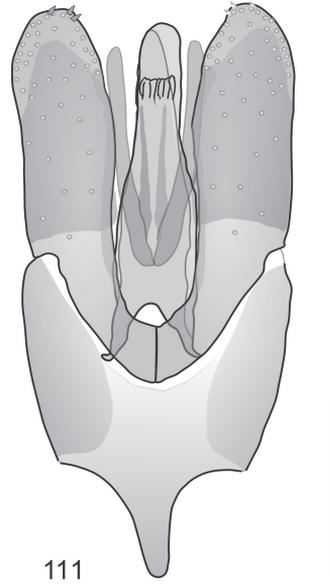
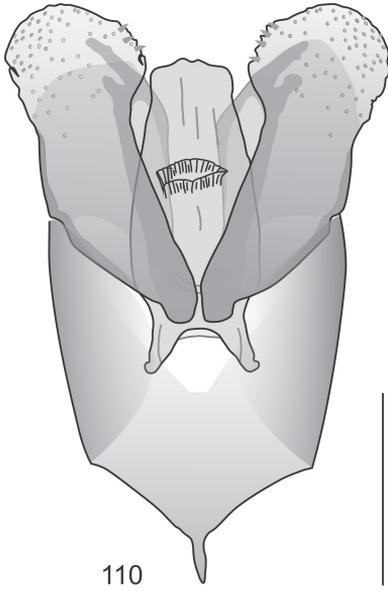
Figs. 81–92: Femora (81–90), and maxillary palpi (91–92): 81) *Agraphydrus pullus*; 82) *A. punctulatus*; 83) *A. pygmaeus*; 84) *A. rostratus*; 85) *A. rugosus*; 86) *A. sipekorum*; 87) *A. stagnalis*; 88) *A. taprobanensis*; 89) *A. tumulosus*; 90) *A. uvaensis*; 91) *A. anatinus*; 92) *A. andamanicus*.



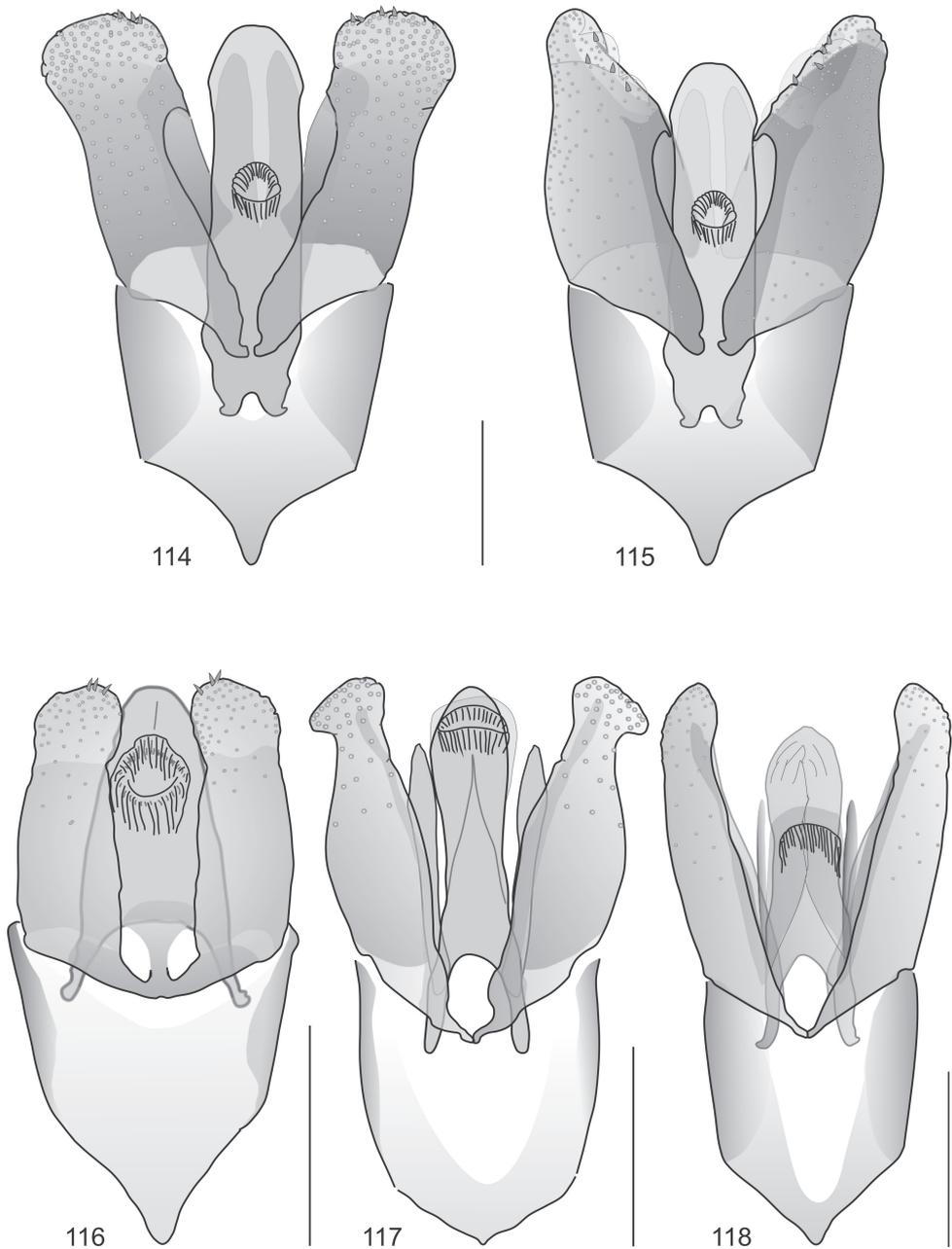
Figs. 93–104: Maxillary palpi: 93) *Agraphydrus angustipennis*; 94) *A. bhutanensis*; 95) *A. boukali*; 96) *A. ceylonensis*; 97) *A. connexus*; 98) *A. fortis*; 99) *A. indicus*; 100) *A. kempii*; 101) *A. meghalayanus*; 102) *A. montanus*; 103) *A. obscuratus*; 104) *A. pauculus*.



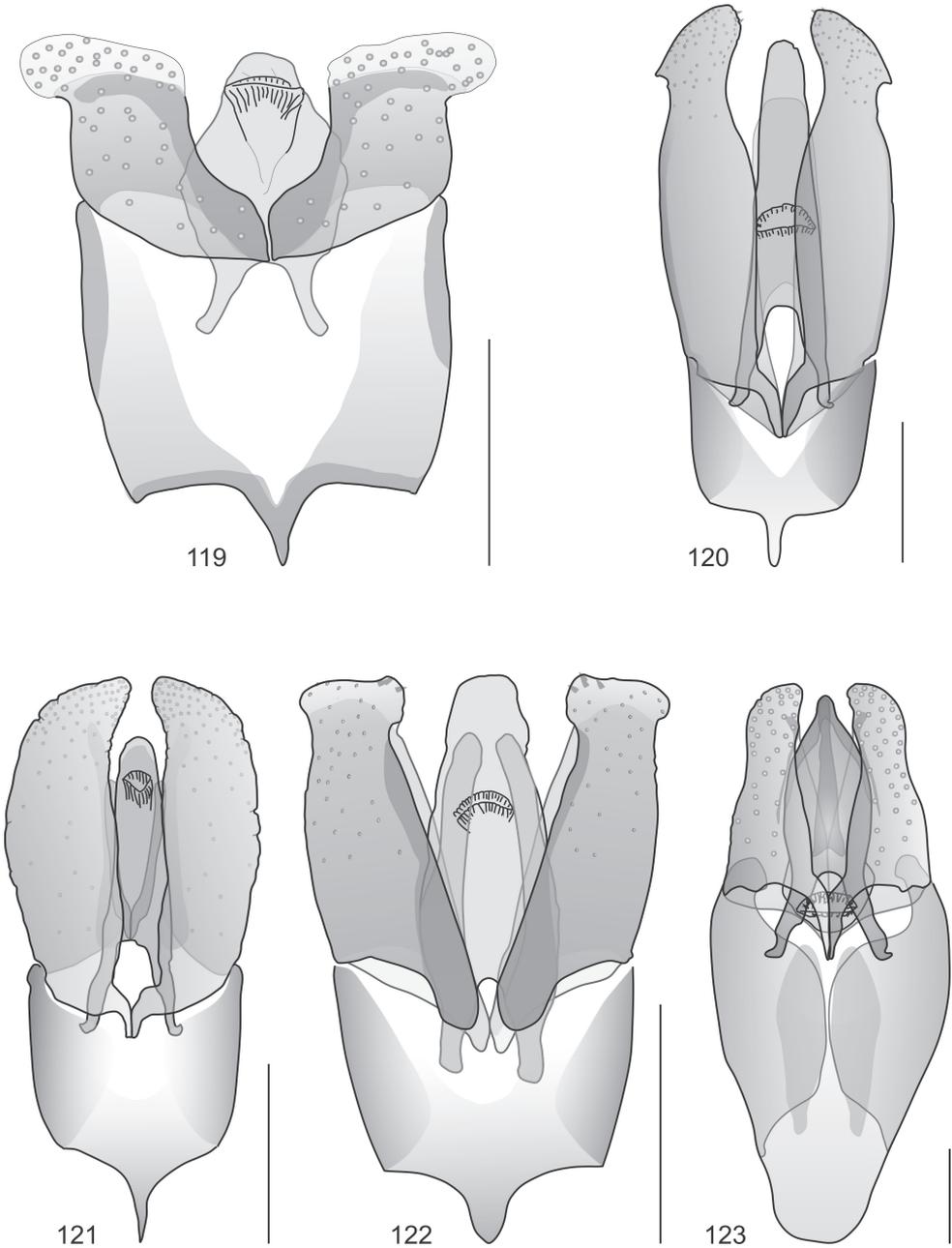
Figs. 105–109: Aedeagi: 105) *Agraphydrus anatinus*; 106) *A. andamanicus*; 107) *A. angustipennis*; 108) *A. annapurnensis*; 109) *A. ater*. Scale = 0.1 mm.



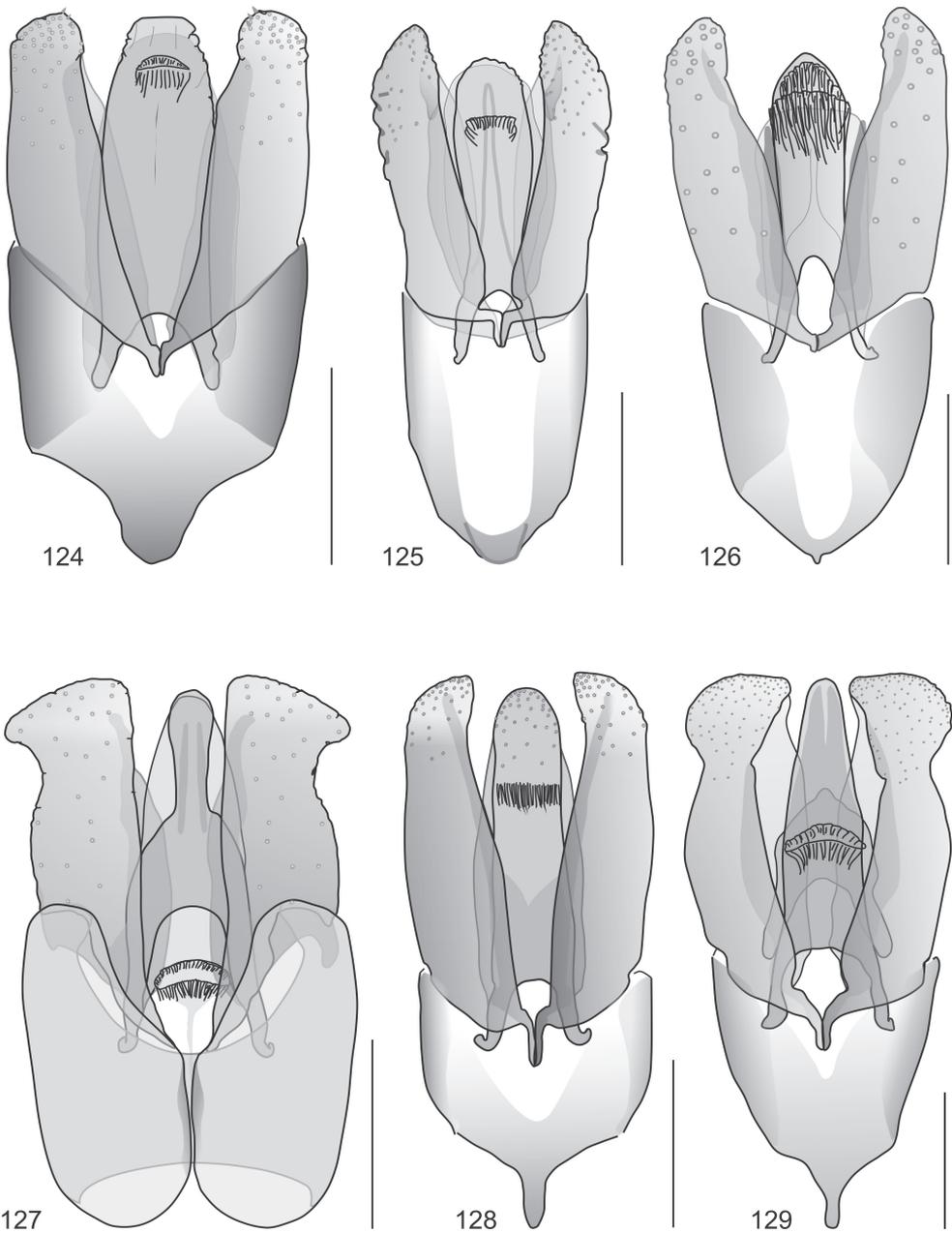
Figs. 110–113: Aedeagus: 110) *Agraphydrus bhutanensis*; 111) *A. boukali*; 112) *A. ceylonensis*; 113) *A. cinnamum*. Scale = 0.1 mm.



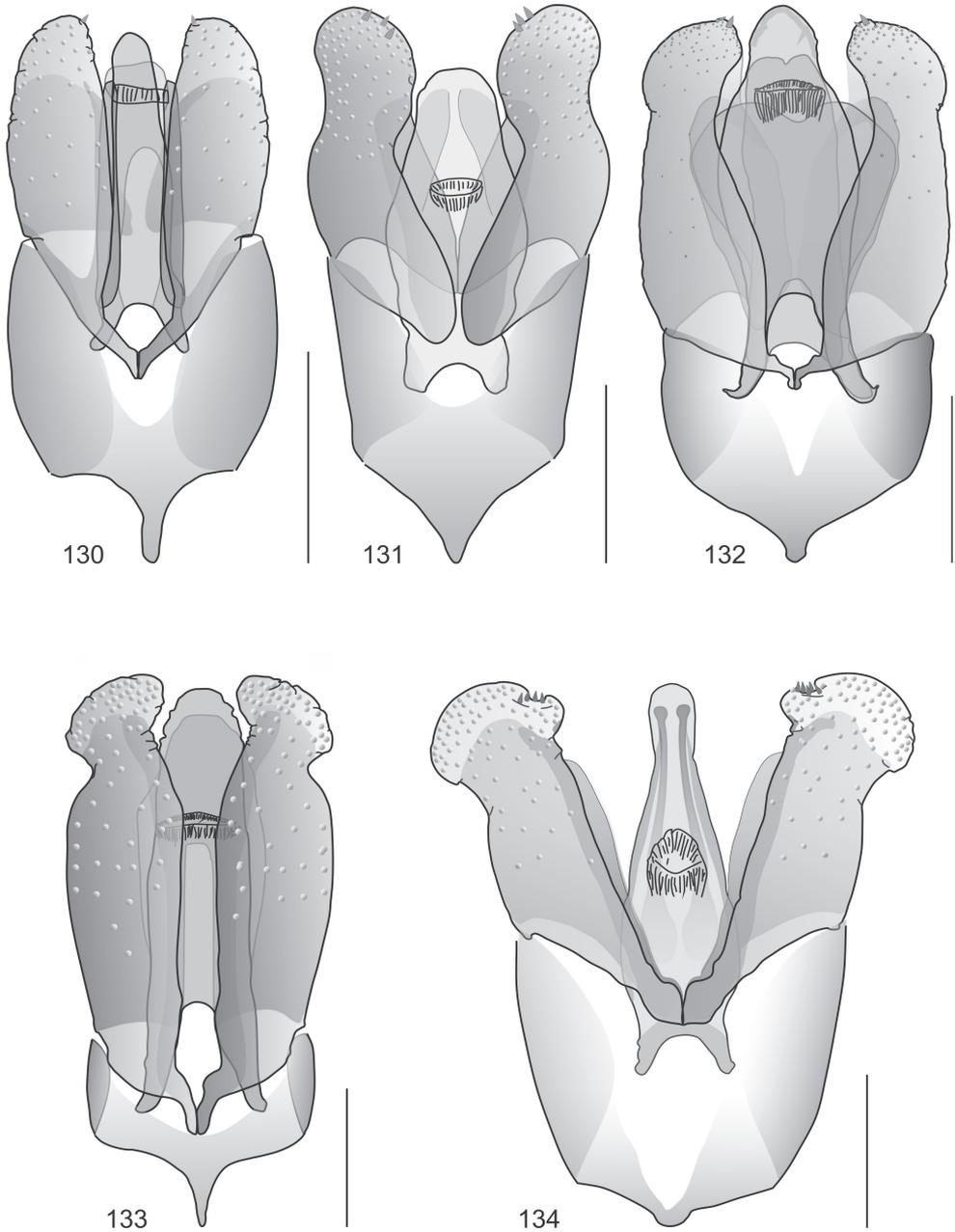
Figs. 114–118: Aedeagus: 114, 115) *Agraphydrus communis*; 116) *A. connexus*; 117) *A. constrictus*; 118) *A. coomani*. Scale = 0.1 mm.



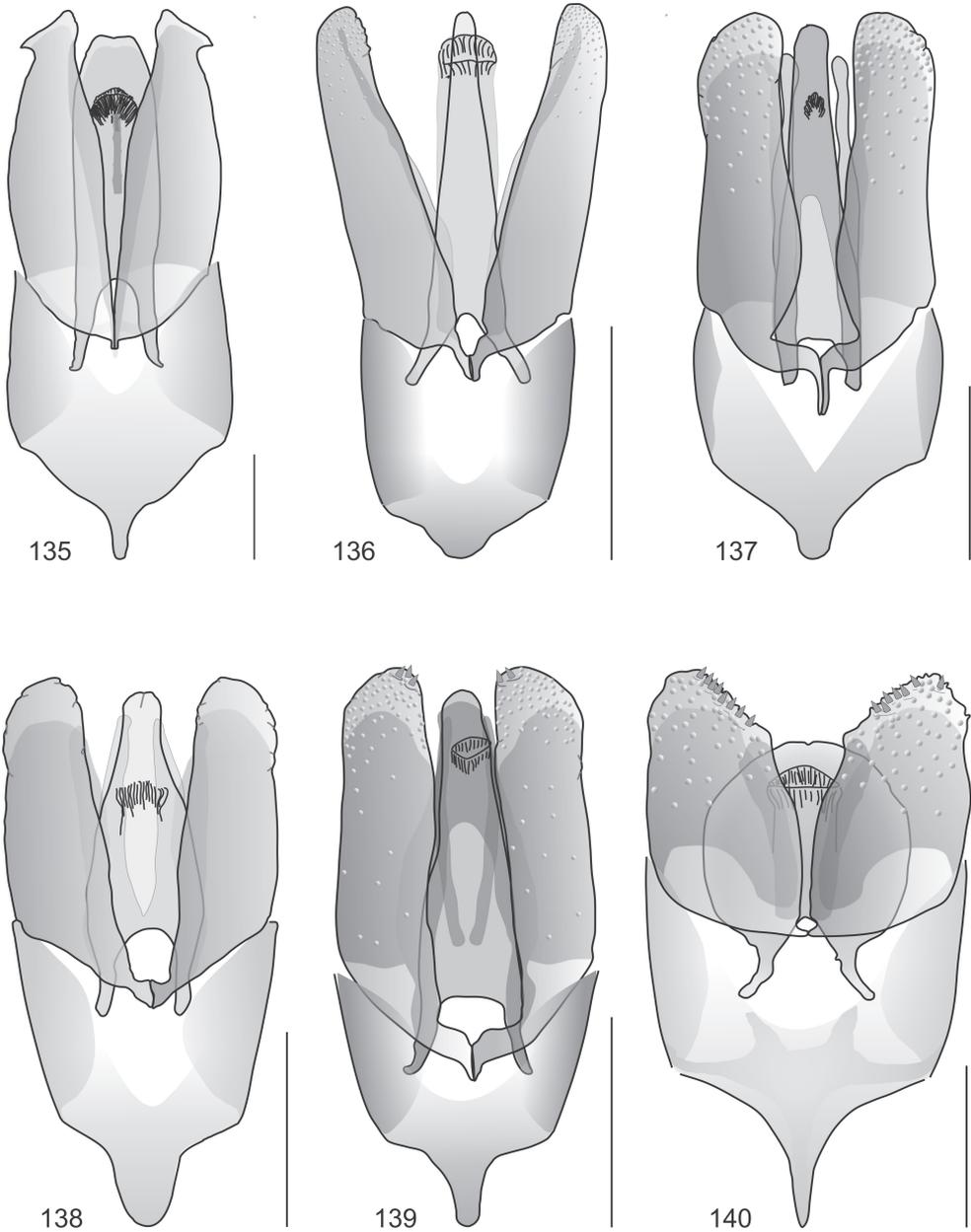
Figs. 119–123: Aedeagus: 119) *Agraphydrus crassipenis*; 120) *A. exedis*; 121) *A. falcatus*; 122) *A. flavonotus*; 123) *A. fortis*. Scale = 0.1 mm.



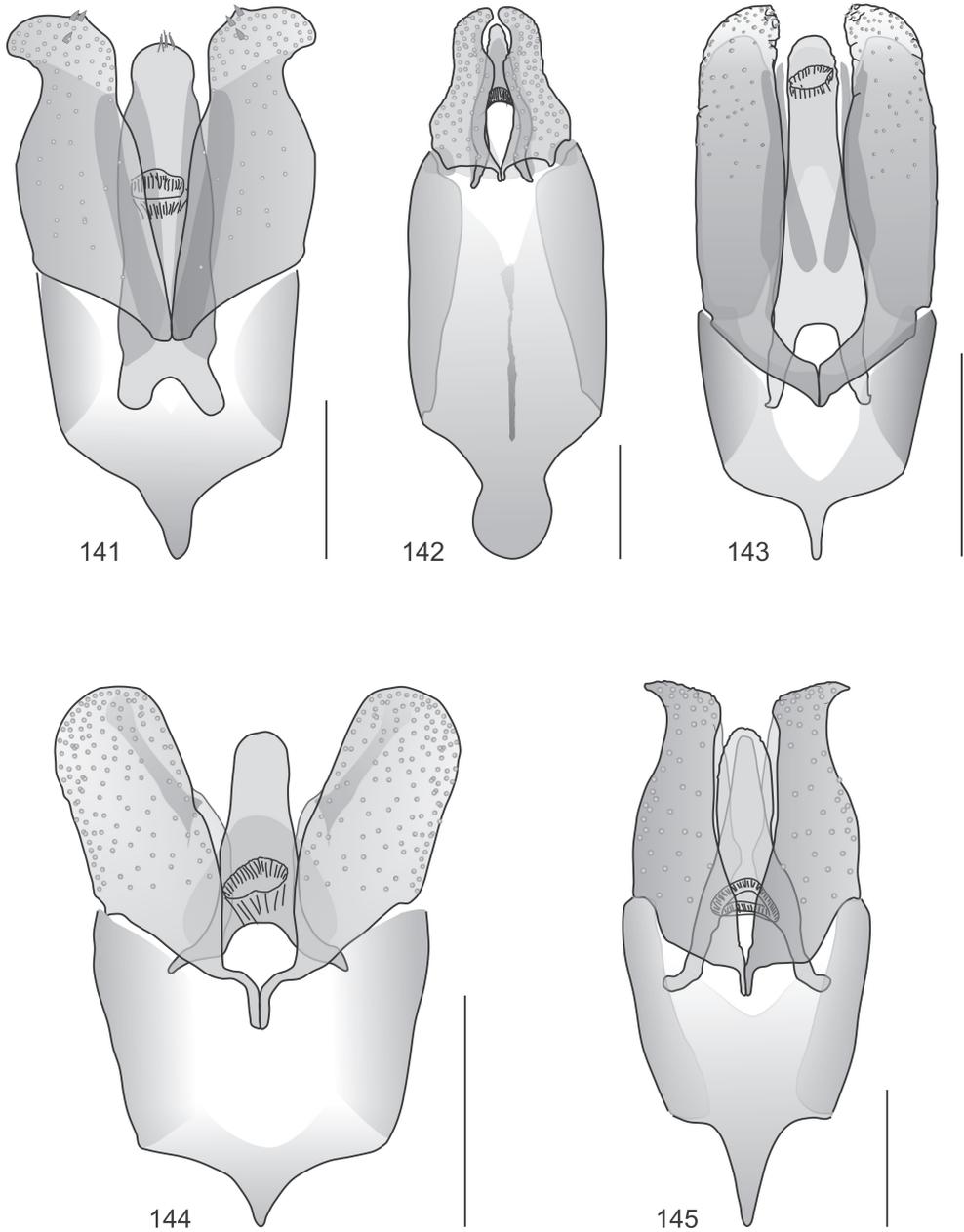
Figs. 124–129: Aedeagus: 124) *Agraphydrus gilvus*; 125) *A. glaber*; 126) *A. heinrichi*; 127) *A. hygropetricus*; 128) *A. indicus*; 129) *A. inflatus*. Scale = 0.1 mm.



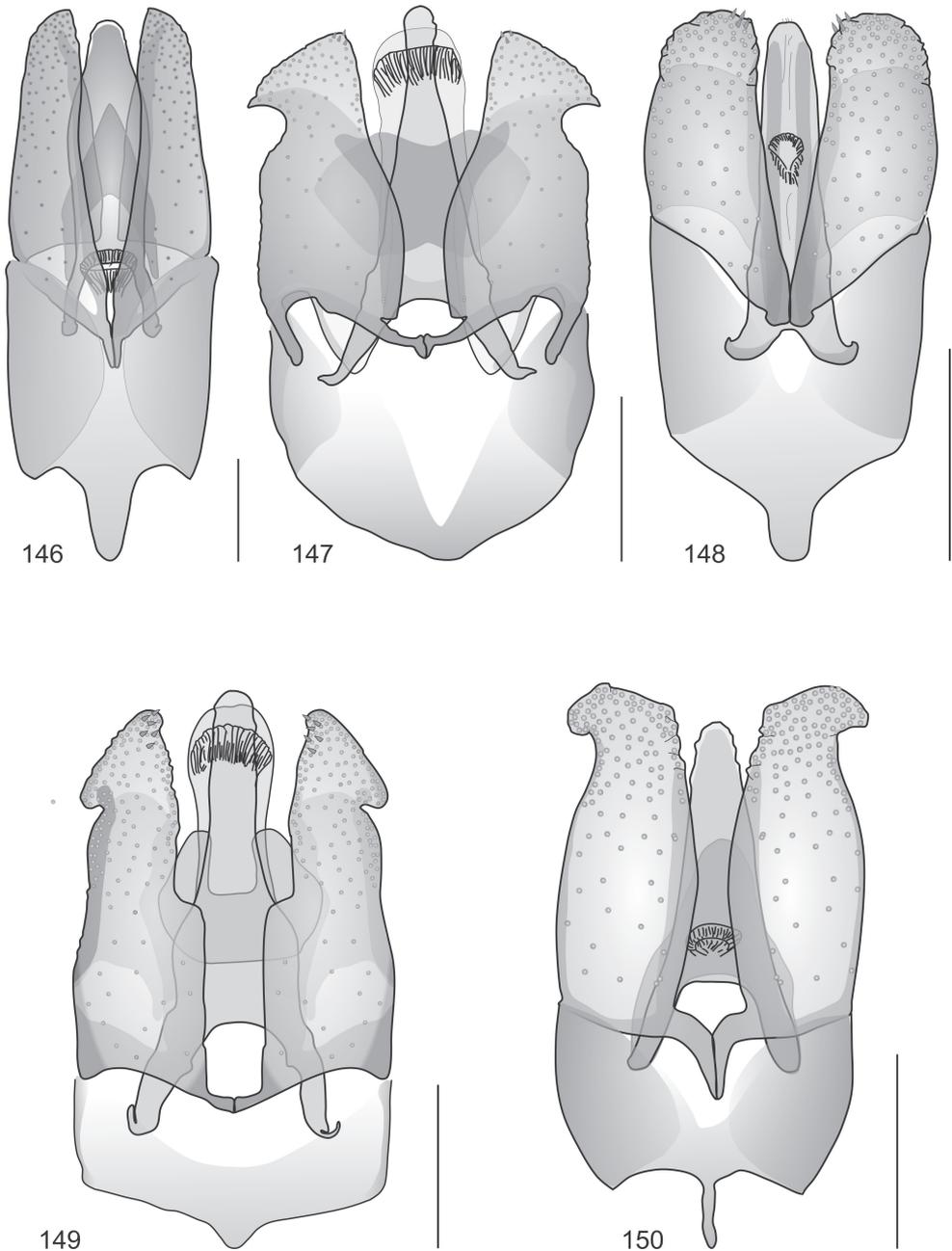
Figs. 130–134: Aedeagus: 130) *Agraphydrus kallari*; 131) *A. kempii*; 132) *A. khasiensis*; 133) *A. kodaguensis*; 134) *A. meghalayanus*. Scale = 0.1 mm.



Figs. 135–140: Aedeagus: 135) *Agraphydrus montanus*; 136) *A. nanus*; 137) *A. nepalensis*; 138) *A. obscuratus*; 139) *A. obsoletus*; 140) *A. pauculus*. Scale = 0.1 mm.



Figs. 141–145: Aedeagus: 141) *Agraphydrus protentus*; 142) *A. pullus*; 143) *A. punctulatus*; 144) *A. pygmaeus*; 145) *A. rostratus*. Scale = 0.1 mm.



Figs. 146–150: Aedeagus: 146) *Agraphydrus rugosus*; 147) *A. sipekorum*; 148) *A. stagnalis*; 149) *A. taprobanensis*; 150) *A. tumulosus*. Scale = 0.1 mm.

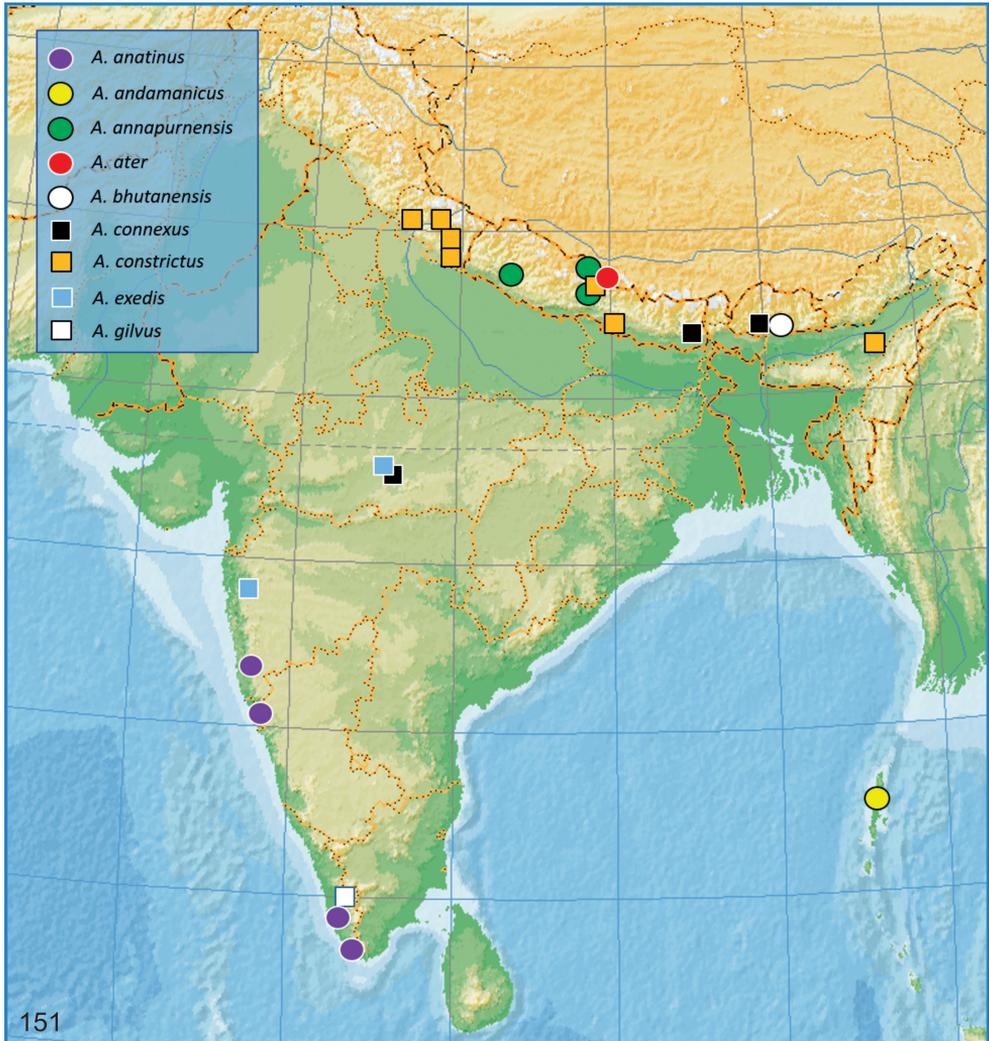


Fig. 151: Distribution of *Agraphydrus anatinus*, *A. andamanicus*, *A. annapurnensis*, *A. ater*, *A. bhutanensis*, *A. connexus*, *A. constrictus*, *A. exedis*, and *A. gilvus* in Bhutan, India, and Nepal.

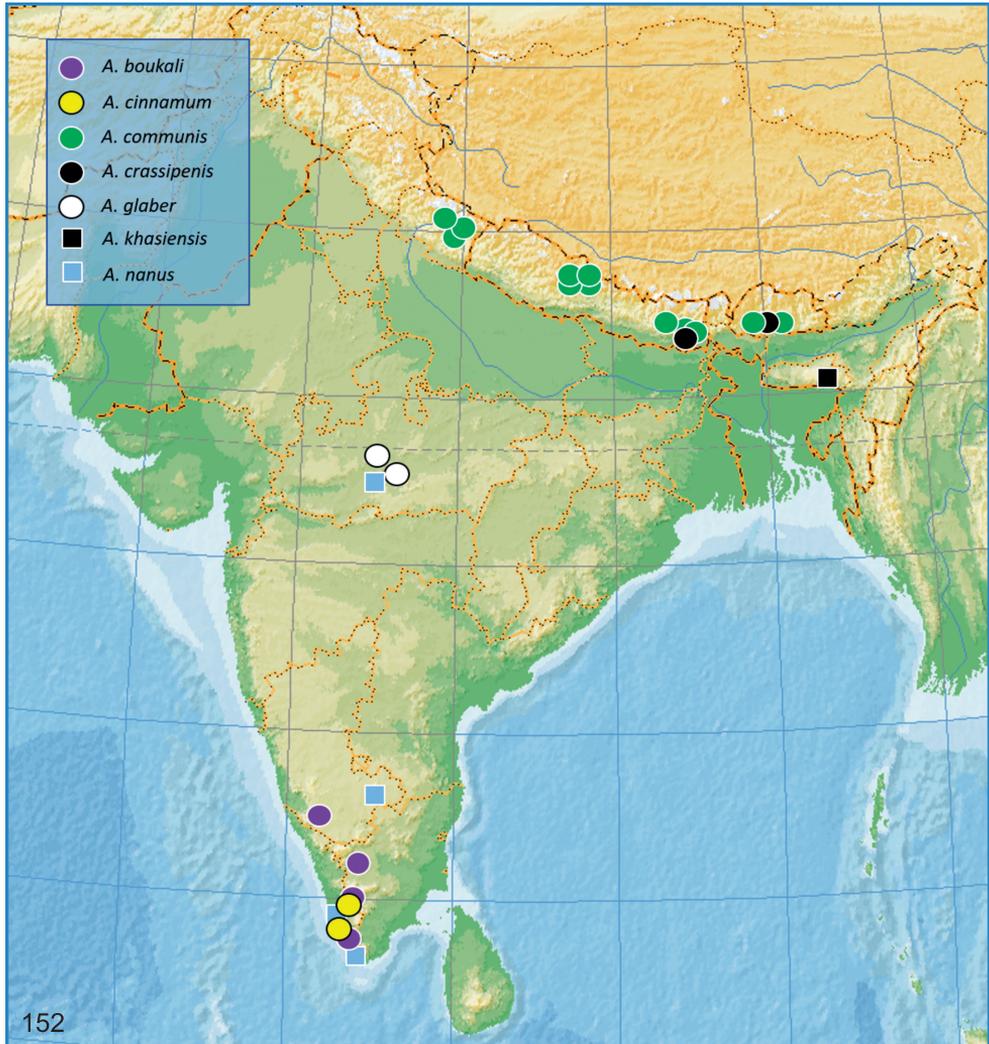


Fig. 152: Distribution of *Agraphydrus boukali*, *A. cinnamum*, *A. communis*, *A. crassipenis*, *A. glaber*, *A. khasiensis*, and *A. nanus* in Bhutan, India, and Nepal.

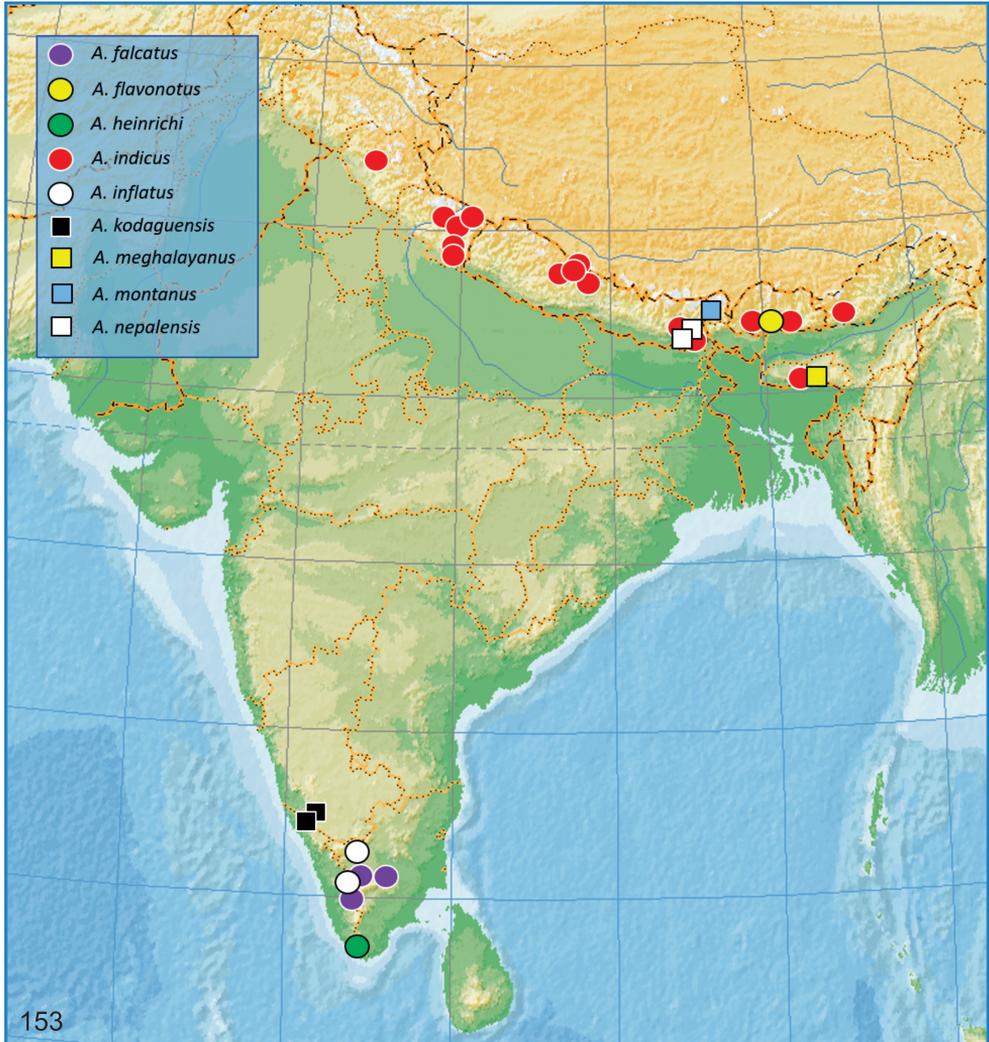


Fig. 153: Distribution of *Agraphydrus falcatus*, *A. flavonotus*, *A. heinrichi*, *A. indicus*, *A. inflatus*, *A. kodaguensis*, *A. meghalayanus*, *A. montanus*, and *A. nepalensis* in Bhutan, India, and Nepal.

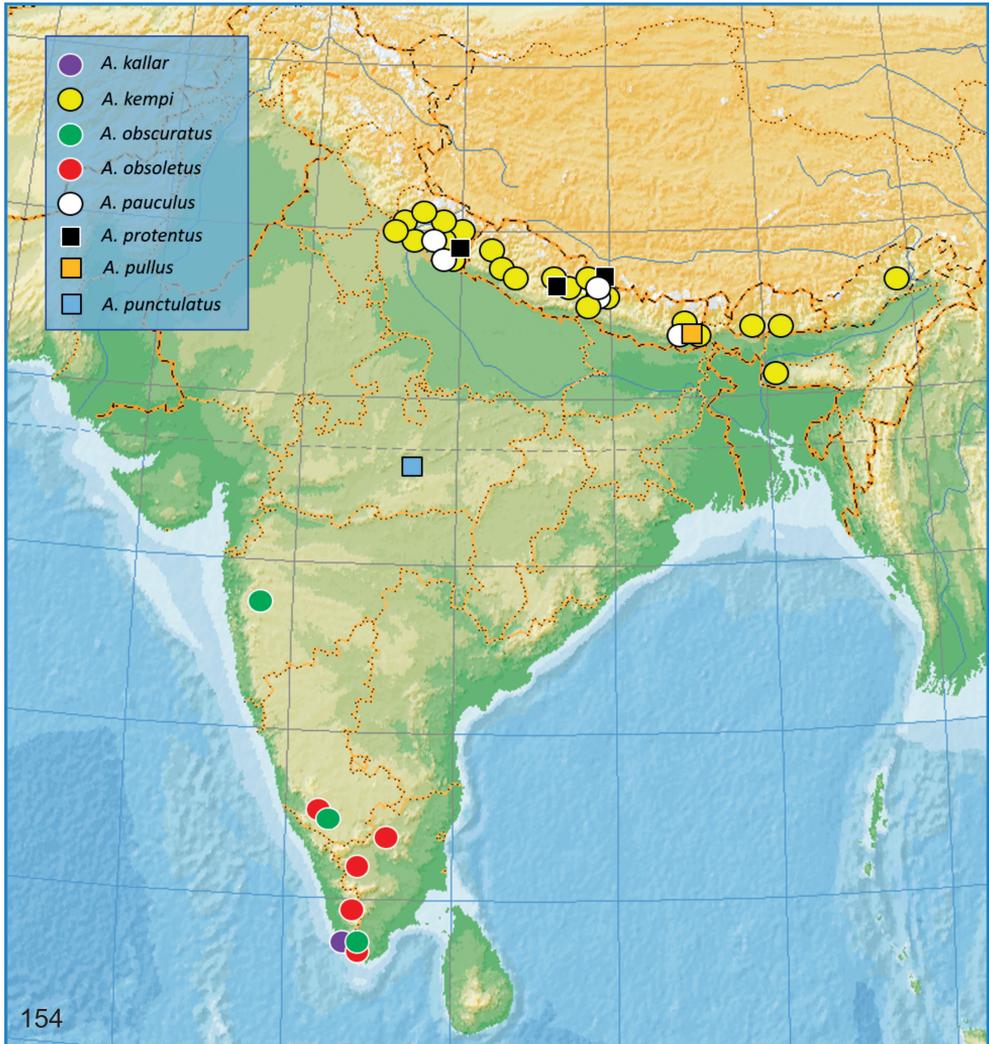


Fig. 154: Distribution of *Agraphydrus kallar*, *A. kempi*, *A. obscuratus*, *A. obsoletus*, *A. pauculus*, *A. protentus*, *A. pullus*, and *A. punctulatus* in Bhutan, India, and Nepal.

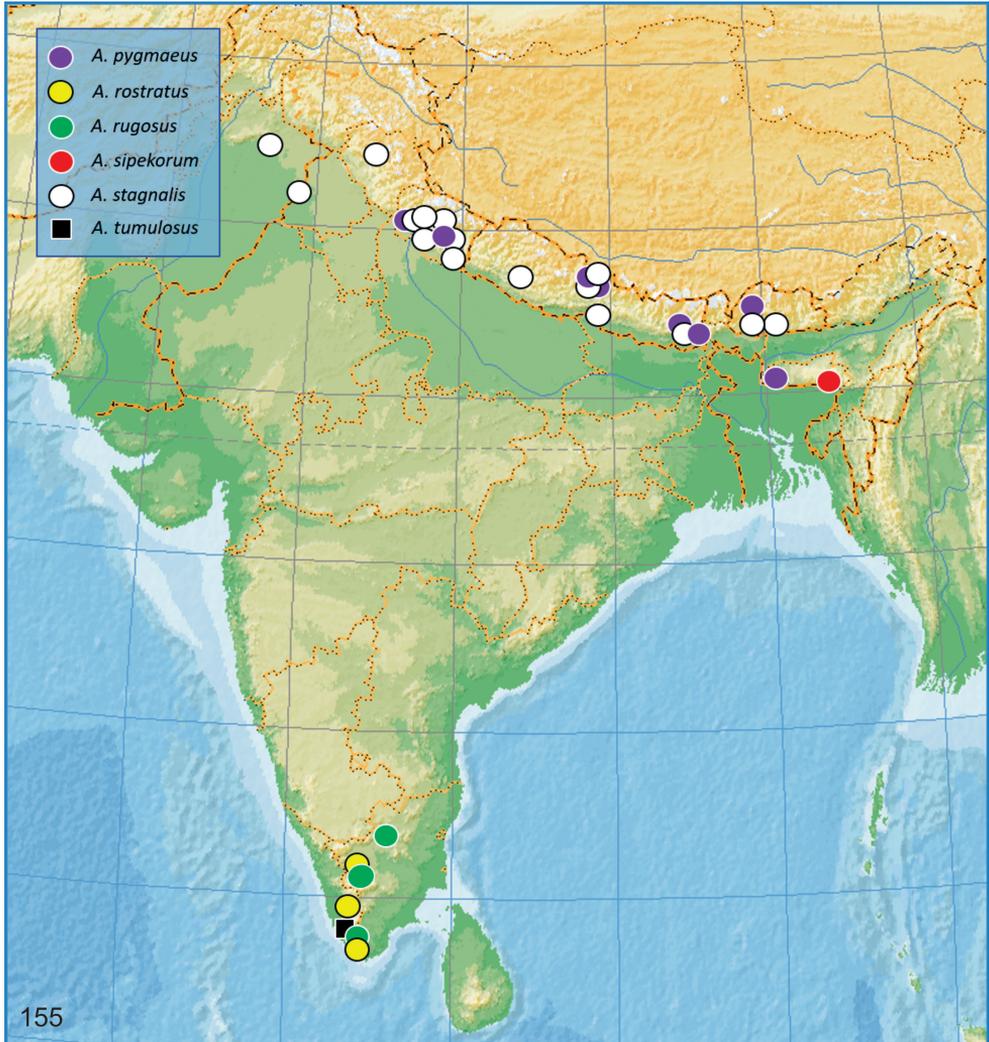


Fig. 155: Distribution of *Agraphydrus pygmaeus*, *A. rostratus*, *A. rugosus*, *A. sipekorum*, *A. stagnalis*, and *A. tumulosus* in Bhutan, India, Nepal and Pakistan.

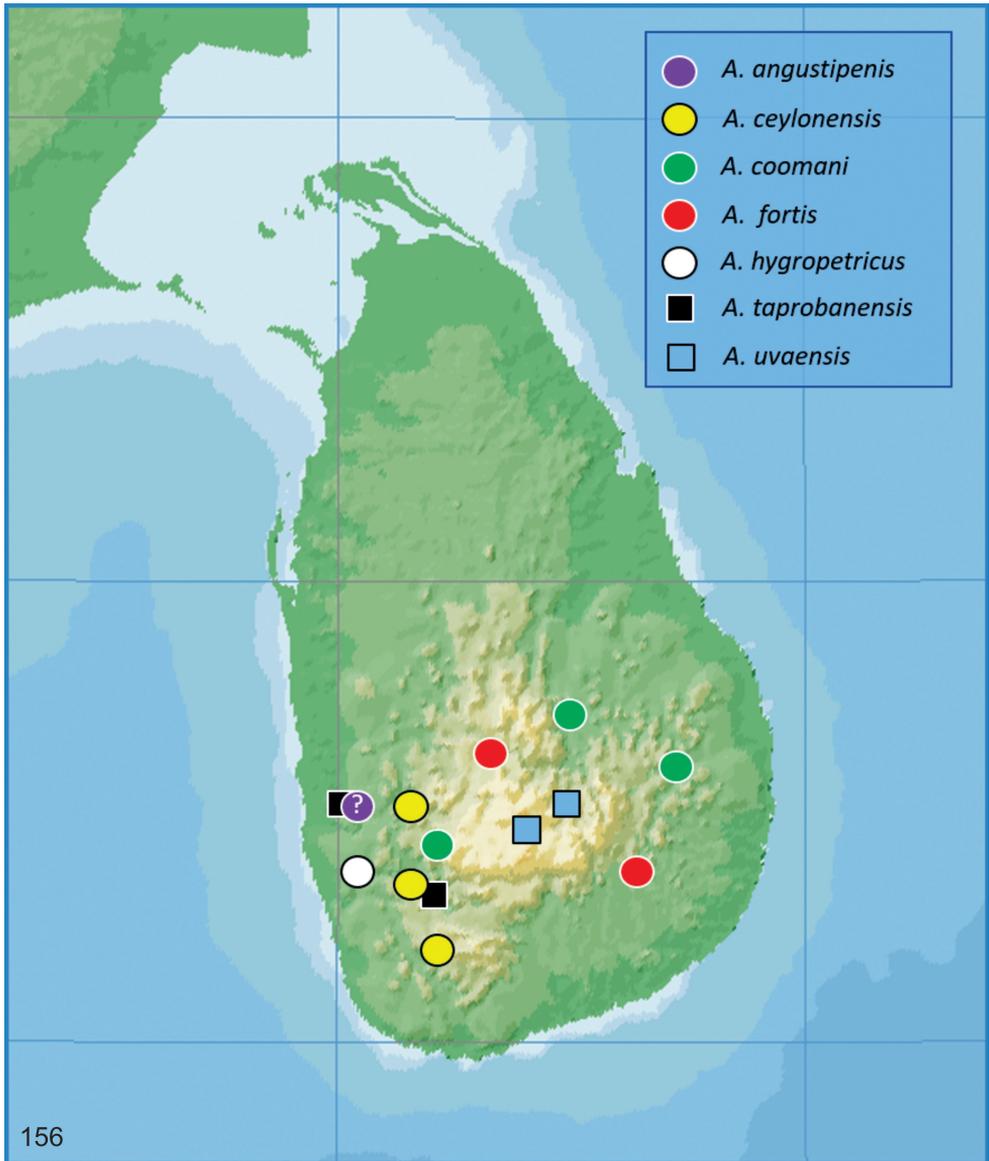


Fig. 156: Distribution of *Agraphydrus angustipenis*, *A. ceylonensis*, *A. coomani*, *A. fortis*, *A. hygropetricus*, *A. taprobanensis*, and *A. uvaensis* in Sri Lanka.

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Zusammenfassung

Die Arten der Gattung *Agraphydrus* RÉGIMBART, 1903 von Bhutan, India, Nepal, Pakistan und Sri Lanka werden revidiert. Insgesamt 36 neue Arten werden beschrieben.

Die Gattung *Agraphydrus* wird erstmals für Bhutan gemeldet; *A. coomani* (ORCHYMONT, 1927) wird erstmals vom Indischen Subkontinent gemeldet; weitere Erstmeldungen: *A. connexus* KOMAREK & HEBAUER, 2018 von Bhutan und Indien; *A. indicus* (ORCHYMONT, 1932) von Bhutan und Nepal; *A. kempi* (ORCHYMONT, 1922), *A. pygmaeus* (KNISCH, 1924) sowie *A. stagnalis* (ORCHYMONT, 1937) von Bhutan.

Agraphydrus coomani und *A. connexus* sind in Ostasien weit verbreitet, alle anderen Arten sind beschränkt auf den Subkontinent, von dem nun 46 *Agraphydrus*-Arten bekannt sind.

Das Habitat von einigen Arten ist unbekannt, die anderen sind aquatisch, neun davon hygropetrisch. Zehn Arten wurden am Licht gesammelt.

Während Nepal relativ gut erforscht ist, gibt es von Pakistan nur einen bekannten Fundort, von Bangladesh keinen, und von Indien, abgesehen vom etwas besser erforschten Uttarakhand, nur sehr wenige bekannte Fundplätze.

Habitusaufnahmen, Aedeaguszeichnungen, zahlreiche Abbildungen morphologischer Details, Verbreitungskarten sowie ein Bestimmungsschlüssel sind angefügt.

References

- BRINCK, P., ANDERSSON, P. & CEDERHOLM, L. 1971: Introduction, pp. IV–XXXVI. – In: Reports from the Lund University Ceylon Expedition in 1962. – Entomologica Scandinavica Suppl. 1, XXXVI+292 pp.
- CHIESA, A. 1967: Compimento di una revisione di Hydrophilidae del Afghanistan (Coleoptera: Hydrophilidae). – Annales historico-naturales Musei nationalis hungarici 59: 275–277.
- FIKÁČEK, M., ANGUS, R.B., GENTILI, E., JIA, F., MINOSHIMA, Y.N., PROKIN, A., PRZEWOŹNY, M. & RYNDEVICH, S.K. 2015: Helophoridae, Hydrochidae, Hydrophilidae, pp. 25–76. – In Löbl, I. & Löbl, D. (eds.): Catalogue of Palaearctic Coleoptera, Vol. 2. Hydrophiloidea – Staphylinoidea. Revised and updated edition. – Leiden: Brill, xxvi+1702 pp.
- GENTILI, E., HEBAUER, F., JÄCH, M.A., JI, L. & SCHÖDL, S. 1995: Hydrophilidae: I. Check list of the Hydrophilinae recorded from China (Coleoptera), pp. 207–219. – In Jäch, M.A. & Ji, L. (eds.): Water Beetles of China. Vol. I. – Wien: Zoologisch-Botanische Gesellschaft in Österreich and Wiener Coleopterologenverein, 410 pp.
- HANSEN, M. 1991: The hydrophiloid beetles. Phylogeny, classification and a revision of the genera (Coleoptera, Hydrophiloidea). – Biologiske Skrifter 40: 1–367.
- HANSEN, M. 1999: Hydrophiloidea (Coleoptera). – In Hansen, M. (ed.): World Catalogue of Insects. Vol. 2. – Stenstrup: Apollo Books, 416 pp.

- HANSEN, M. 2004: Family Hydrophilidae Latreille, 1802, pp. 44–68. – In Löbl, I. & Smetana, A. (eds.): Catalogue of Palaearctic Coleoptera. Volume 2. Hydrophiloidea – Histeroidea – Staphylinoidea. – Stenstrup: Apollo Books, 942 pp.
- HEBAUER, F. 2000a: Results of the Lund University Expedition 1968, Hydrophilidae, with an updated Sri Lanka check list (Coleoptera: Hydrophilidae). – Acta Coleopterologica 16 (2): 3–13.
- HEBAUER, F. 2000b: The genus *Megagraphydrus* Hansen, 1999, with description of new species (Coleoptera: Hydrophilidae). – Acta Coleopterologica 16 (2): 14–22.
- JÄCH, M.A. 1984: Die Koleopterenfauna der Bergbäche von Südwest-Ceylon (Col.). – Archiv für Hydrobiologie / Supplementum 69 (2): 228–332.
- KNISCH, A. 1924: Neue Palpicornier aus dem südlichen Himalaya (Coleoptera, Hydrophilidae). – Wiener Entomologische Zeitung 41 (1–3): 29–41.
- KOMAREK, A. & HEBAUER, F. 2018: Taxonomic revision of *Agraphydrus* Régimbart, 1903 I. China and Taiwan (Coleoptera: Hydrophilidae: Acidocerinae). – Zootaxa 4452 (1): 1–101.
- MATSUI, E. 1994: Three new species of the genus *Enochrus* from Japan and Taiwan (Coleoptera: Hydrophilidae). – Transactions of the Shikoku entomological Society 20: 215–220.
- MINOSHIMA, Y., KOMAREK, A. & ÔHARA, M. 2015: A revision of *Megagraphydrus* Hansen (Coleoptera, Hydrophilidae): synonymization with *Agraphydrus* Régimbart and description of seven new species. – Zootaxa 3930 (1): 1–63.
- ORCHYMONT, A. d' 1922: Zoological Results of the Abor Expedition 1911–12. L. Coleoptera, X: Hydrophilidae. – Records of the Indian Museum 8: 623–629.
- ORCHYMONT, A. d' 1927: Papers on Malayan aquatic biology. V. Notes on the Hydrophilidae in the Federated Malay States Museums. – Journal of the Federated Malay States Museums 13: 246–252.
- ORCHYMONT, A. d' 1928: Catalogue of Indian Insects. Part 14. – Palpicornia. – Government of India Central Publication Branch, Calcutta, 2 + 146 pp.
- ORCHYMONT, A. d' 1932: Zur Kenntnis der Kolbenwasserkäfer (Palpicornia) von Sumatra, Java und Bali. – Archiv für Hydrobiologie. Supplement, Band IX (Tropische Binnengewässer II): 623–714, pls. XIV–XVII.
- ORCHYMONT, A. d' 1937a: Descriptions of three new Hydrophilidae from India. – Records of the Indian Museum XXXIX (part I): 29–31.
- ORCHYMONT, A. d' 1937b: Coleoptera Palpicornia from the Khewra Gorge, Salt Range, Punjab. – Records of the Indian Museum XXXIX (part I): 33–41.
- WATTS, C.H.S. 1995: Revision of the Australasian genera *Agraphydrus* Régimbart, *Chasmogenus* Sharp and *Helochares* Mulsant (Coleoptera, Hydrophilidae). – Records of the South Australian Museum 28 (1): 113–130.

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