

HYDROPHILIDAE:

I. Check list and key to Palearctic and Oriental genera of aquatic Hydrophilidae

(Coleoptera)

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Abstract

A systematic synopsis of Palearctic and Oriental genera of aquatic Hydrophilidae including brief statements on their geographical distribution is given, followed by an illustrated dichotomous key. *Pseudopelthydrus* JIA, 1998 is synonymized with *Agraphydrus* RÉGIMBART, 1903.

Key words: Coleoptera, Hydrophilidae, generic check list, generic key, Palearctic, Oriental.

Introduction

The family Hydrophilidae (sensu HANSEN 1991) includes four subfamilies: Horelophinae, Horelophopsinae, Hydrophilinae, and Sphaeridiinae. However, following the concept of LAWRENCE & NEWTON (1995) Hydrophilidae comprises also Helophorinae, Epimetopinae, Hydrochinae, Spercheinae, and Georissinae, treated as families by HANSEN (1991) and other authors. In the present paper I follow the concept of HANSEN (1991), on which the tribal and subtribal organization is based.

Of the four subfamilies only two (Hydrophilinae, Sphaeridiinae) are recorded from the Palearctic and Oriental regions. Hydrophilinae, comprising more than 1600 described species, are mostly aquatic. Sphaeridiinae, comprising more than 800 species, are mostly terrestrial; aquatic representatives are found only in the tribe Cocllostomatini and in the genus *Cereyon* LEACH.

A total of thirty-four genera of aquatic Hydrophilidae is known from the Palearctic and Oriental regions. Twenty-six of them have been recorded from China, where the borders of these two geographical realms overlap. Most hydrophilid genera are not confined strictly to one of these realms.

A check list of Chinese hydrophilid species was published by GENTILI et al. (1995). Since then, four additional genera (*Hydrophilomima* HANSEN & SCHÖDL, 1997, *Megagrphydrus* HANSEN, 1999, *Notionotus* SPANGLER, 1972, and *Pseudopelthydrus* JIA, 1998) and numerous additional species have been recorded from China.

Check list of Palearctic and Oriental hydrophilid genera

The following abbreviations are used to denote major biogeographic regions: Palearctic (PA), Oriental (OR), Afrotropical (AT), Australian (AU), Nearctic (NA), and Neotropical (NT).

HYDROPHILINAE

Sperchopsini*Ametor* SEMENOV

PA, OR, NA: 5 spp., China (PA, OR): 4 spp.

Hydrocassis FAIRMAIRE

PA, OR: 14 spp., China (PA, OR): 13 spp.

Berosini*Allocotocerus* KRAATZ

PA, AT, OR, AU: 26 spp., China (OR): 2 spp.

Berosus LEACH

worldwide: 263 spp., China (PA, OR): 15 spp.

Regimbartia ZAITZEV

PA, AT, OR, AU: 10 spp., China (PA, OR): 1 sp.

Chaetarthriini*Amphiops* ERICHSON

PA, AT, OR, AU: 20 spp., China (PA, OR): 5 spp.

Chaetarthria STEPHENS

PA, AT, OR, NA, NT: 46 spp., China (OR): 1 sp.

Hemisphaera PANDELLÉ

PA, AT: 5 spp.

Thysanarthria d'ORCHYMONT

PA, AT, OR: 10 spp.

Anacaenini*Anacaena* THOMSON

worldwide: 58 spp., China (PA, OR): 11 spp.

Crenitis BEDEL

worldwide: 40 spp., China (PA, OR): 6 spp.

Notionotus SPANGLER

OR, NT: 12 spp., China (OR): 2 spp.

Paracymus THOMSON

worldwide: 81 spp., China (OR): 1 sp.

Laccobiini*Arabhydrus* HEBAUER

PA: 1 sp. (Oman)

Hydrophilomima HANSEN & SCHÖDL

OR: 3 spp., China: 1 sp.

Laccobius ERICHSON

PA, AT, OR, AU, NA: 215 spp., China (PA, OR): 21 spp.

Oocyclus SHARP

OR, NT: 17 spp., China (OR): 5 spp.

Pelthydrus d'ORCHYMONT

PA, OR: 55 spp., China (OR): 12 spp.

Scoliopsis d'ORCHYMONT

OR: 1 sp. (Sri Lanka)

Hydrophilini

Acidocerina

Agraphydrus RÉGIMBART¹

PA, OR, AT, AU: 17 spp., China (OR): 3 spp.

Chasmogenus SHARP

PA, AT, OR, AU, NT: 32 spp., China (OR): 1 sp.

Cymbiodyta BEDEL

PA, NA, NT: 29 spp., not known from China

Enochrella HANSEN

OR: 1 sp. (Philippines)

¹ Recently, the author was able to examine two female paratypes of *Pseudopelthydrus longipalpis* JIA (type species of *Pseudopelthydrus*). Without doubt these specimens belong to the genus *Agraphydrus*. The latter was obviously not known to JIA (1998), who did not mention this genus at all. Therefore, I herewith formally synonymize *Pseudopelthydrus* JIA, 1998 with *Agraphydrus* RÉGIMBART, 1903. Numerous specimens of *Pseudopelthydrus longipalpis*, collected by the China Water Beetle Survey in Hainan, are deposited in the Naturhistorisches Museum Wien.

<i>Enochrus</i> THOMSON	worldwide: 189 spp., China (PA, OR): 14 spp.
<i>Helochaures</i> Mulsant	worldwide: 162 spp., China (PA, OR): 6 spp.
<i>Helopeltarium</i> d'ORCHYMONT	OR: 1 sp. (Burma)
<i>Megagraphydrus</i> HANSEN	OR: 10 spp., China: 3 spp.

Hydrobiina

<i>Hydrobius</i> LEACH	PA, NA: 8 spp., China: 3 spp.
<i>Limnoxenus</i> MOTSCHULSKY	PA, AT, AU, Hawaii: 6 spp.

Hydrophilina

<i>Hydrobiomorpha</i> BLACKBURN	worldwide: 53 spp., China (OR): 1 sp.
<i>Hydrochara</i> BERTHOLD	PA, AT, OR, NA: 23 spp., China (PA, OR): 4 spp.
<i>Hydrophilus</i> MÜLLER	worldwide: 48 spp., China (PA, OR): 10 spp.
<i>Sternolophus</i> SOLIER	PA, AT, OR, AU: 9 spp., China (PA, OR): 4 spp.

SPHAERIDIINAE

Coclostomatini

<i>Coclostoma</i> BRULLÉ	PA, OR, AT, AU: 93 spp., China (PA, OR): 10 spp.
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General remarks on the morphology of Hydrophilidae

Easily recognizable common features of Hydrophilidae are: Body-outline evenly rounded, not or only slightly interrupted between pronotum and elytra; head not abruptly constricted behind eyes; antennae with seven to nine antennomeres; morphology of antennae: Scapus, pedicellus, one to three intermediate segments and cupula glabrous (sometimes with very few setae), three-segmented club densely pubescent; clypeus, frons, pronotum, and elytra without granules, pronotum without anteromedian projection; ventral face of thoracic and abdominal segments largely covered with hydrofuge pubescence.

Hydrophilidae vary strongly in size, the representatives of the genera treated here are between 1.3 and 50 mm long. There is a great variability in body-shape, from hemispherical to rather flat, from oblong ovoid to short, and in the length and shape of antennal club-segments and maxillary palpi, in the shape of eyes, clypeus, pronotum and elytra. Additional distinguishing characters used in the key are: Sclerotization of labrum weak or strong, labrum exposed or covered by clypeus; number of antennomeres between seven and nine; pronotum and elytra smooth or punctate; elytra varying from pale (yellowish brown) to dark brown and almost black, with or without striae or serial punctures, with or without sutural stria; elytral margins denticulate or smooth; pro-, meso-, and metaventrite flat, moderately raised, or with characteristic median elevations, such as keels, processes, or platforms; metafemora with or without hydrofuge pubescence; meso-/metatibiae and meso-/metatarsi with or without swimming hairs; metatibiae curved or straight; meso-/metatarsi with four or five tarsomeres; relative length of metatarsomeres; five or six visible abdominal ventrites; shape of basal abdominal ventrites; extension of pubescence on abdominal ventrites.

Setiferous punctures arranged in groups, rows, or other patterns on clypeus, frons and pronotum are sometimes present in Hydrophilidae. HANSEN (1991) considers these "systematic punctures"

as reliable feature to distinguish hydrophilid genera and tribes. This opinion is not shared by the author of the present paper, and therefore this character is not used in the key to genera below.

For reasons of general comprehension, the terms "mesosternum" and "metasternum" generally used in earlier taxonomic literature to describe the median meso- and metathoracic ventrites are replaced herein by the terms "mesoventrite" and "metaventrite" (see also CAMPAU 1940, LARSÉN 1966, MATSUDA 1970, BEUTEL 1986).

Key to genera

- 1 Middle and hind tarsi with long swimming hairs (Figs. 4 - 5).....2
- Middle and hind tarsi without swimming hairs.....13
- 2 Meso- and metaventrite very strongly raised medially to a prominent joint sternal keel (visible in lateral view), extending posteriorly into a spine (Figs. 1 - 3). Body length: 7.5 - 50 mm3
- Meso- and metaventrite not forming a median common sternal keel. Body length: 1.5 - 11.0 mm6
- 3 First segment of antennal club deeply split into two asymmetrical lobes, narrower lobe with a few long setae (Figs. 8, 9).....4
- First segment of antennal club not deeply split into two asymmetrical lobes, without long setae (Figs. 10, 11).....5
- 4 Prosternum anteromedially with a conspicuous process, deeply sulcate posteriorly. Meso-metaventral keel without notch and seta, posteriorly extending in a long spine (Fig. 1). Antenna: Fig. 8. Body length: 20 - 50 mm..... *Hydrophilus*
- Prosternum anteromedially with short projection. Meso-metaventral keel anteriorly with a small notch and few long setae, posteriorly extending in a short spine (Fig. 2). Antenna: Fig. 9. Body length: 12 - 28 mm..... *Hydrobiomorpha*
- 5 Prosternum with conspicuous anteromedial projection, bearing one or a few rather long seta(e) (Fig. 3). Apical segment of maxillary palpi not shorter than penultimate (Fig. 6), first club-segment of antenna not lunulate (Fig. 10). Body length: 7.5 - 14.0 mm..... *Sternolophus*
- Prosternum medially highly tectiform, its anterior projection without seta. Apical segment of maxillary palpi not longer than penultimate (Fig. 7), first club-segment of antennae lunulate (Fig. 11). Body length: 10 - 20 mm *Hydrochara*
- 6 Abdomen with six ventrites (Fig. 25)7
- Abdomen with five ventrites.....8
- 7 Maxillary palpi half as long as width of head. Visible abdominal ventrites I - V rather shiny and sparsely pubescent, only ventrite VI densely pubescent. Metatibiae curved inwards (Fig. 25) or straight. Elytra often with serial punctures. Body form variable, from shortly oval to more oblong oval, but never as in Fig. 40. Body length: 1.5 - 4.5 mm. *Laccobius*
- Maxillary palpi as long as width of head. All visible abdominal ventrites with hydrofuge pubescence laterally. Tibiae straight. Elytra without striae or serial punctures. Body form oblong oval (Fig. 40). Body length: 4 mm..... *Arabhydrus*
- 8 Clypeus very large, flat, rectangular to trapeziform, anterior margin concave with anterior corners distinctly angulate (Fig. 35). Mesoventrite with characteristic craniad directed process, widened to a triangular or pentagonal horizontal platform. Elytra with densely arranged irregular punctures, but without striae, seldom with traces of hardly recognizable rows of serial punctures. Body length: 2.0 - 3.5 mm..... *Pelthydrus*
- Clypeus sometimes large, but never with distinctly angulate anterior corners. Mesoventrite sometimes with a distinct sharp process, never widened to a platform. Elytra with striae or rows of serial punctures, at least laterally9

- 9 Head not or at most slightly deflexed towards ventral face, thus body without ability to roll up. Middle and hind tibiae without long swimming hairs on dorsal face (Fig. 5). Nine antennomeres 10
- Head distinctly deflexed towards ventral face, thus body with ability to roll up (Figs. 12 - 14). Middle and hind tibiae with long swimming hairs on dorsal face (Fig. 4). Seven or eight antennomeres 11
- 10 Elytra with feebly impressed serial punctures. Prosternum tectiform, strongly raised medially. Meso- and metaventrite with strongly raised but not fused median keels (Fig. 26). Body length: 8 - 11 mm *Limnoxenus*
- Elytra with conspicuously impressed serial punctures. Prosternum only weakly raised medially, not or only finely carinate. Meso- and metaventrite without keel, but mesoventrite often with dentiform posteromedian process, metaventrite moderately raised medially (Fig. 27). Body length: 5 - 11 mm *Hydrobius*
- 11 Body moderately convex, never hemispherical (Fig. 12). Pronotum and elytra yellowish to brownish, never black. Body length: 1.5 - 9.0 mm *Berosus*
- Body very strongly convex, hemispherical (Figs. 13, 14). Pronotum and elytra shining, black 12
- 12 Elytra more or less attenuate apically, with rows of serial punctures (Fig. 13). Body length: 2.5 - 5.5 mm *Regimbartia*
- Elytra not attenuate apically, serial punctures restricted to lateral portion (Fig. 14). Body length: 2.5 - 5.0 mm *Allocotocerus*
- 13 Elytral margins finely serrate or denticulate, pronotum with double punctation. Body length: 4.0 - 9.5 mm. 14
- Elytral margins not finely serrate or denticulate, pronotum never with double punctation 15
- 14 Aedeagal corona apical. *Ametor*
- Aedeagal corona subapical. *Hydrocassis*
- 15 Eyes completely divided into a dorsal and a ventral part. Body highly spherical (Fig. 19). Body length: 3 - 5 mm. *Amphiops*
- Eyes not completely divided into a dorsal and a ventral part. 16
- 16 First and second visible abdominal ventrite with a large cavity on each side, filled with a hyaline mass, and covered by a fringe of long setae. Very small: 1.0 - 2.5 mm 17
- Basal ventrites not with a large cavity on each side. 19
- 17 Body highly spherical, elytra appearing strongly rounded in dorsal view (Figs. 16, 17). Antennal scape very long, about four times as long as pedicel (Fig. 23). 18
- Body not extremely spherical, elytra appearing moderately rounded, anterior half almost parallel-sided in dorsal view (Fig. 15). Antennal scape rather short, only about 2 times as long as pedicel (Fig. 24). Body length: 1.0 - 1.5 mm. *Hemisphaera*
- 18 Elytra entirely without striae or serial punctures (Fig. 16). Body length: 1.3 - 2.5 mm. *Chaetarthria*
- Elytra with 10 sharply impressed, impunctate striae, more or less abbreviated anteriorly (Fig. 17). 1.5 - 2.0 mm *Thysanarthria*
- 19 Middle and hind tarsi with four segments (Fig. 20) Body length: 2.5 - 7.5 mm *Cymbiodyta*
- Middle and hind tarsi with five segments (Figs. 21, 22). (First segment sometimes very short and partly hidden by terminal tibial spurs; often not detectable in dorsal view, due to very oblique segmental border between first and second tarsomere, therefore, ventral or lateral view recommended) 20
- 20 First segment of hind tarsi much longer than second (Fig. 22). Labrum weakly sclerotized, largely retracted under clypeus and fringed with setae (Fig. 28). Second palpomere of maxillary palpi swollen, thicker than following palpomeres (Fig. 28). Elytra entirely without

- striae or serial punctures, except for a sutural stria in posterior half. Broadly oval, strongly convex. Body length: 3.0 – 7.5 mm **Coelostoma**
- First segment of hind tarsi much shorter than second (Fig. 21). Labrum well sclerotized, in front of clypeus, without fringes of setae. Second palpomere of maxillary palpi either swollen or as wide as following palpomeres. Elytra with or without striae or serial punctures. Body shape variable..... 21
- 21 Clypeus with angulate extensions laterally, notching eyes anteriorly, concealing labrum completely (Fig. 18). Body broadly oval and flat, elytra distinctly explanate laterally, without striae or serial punctures. Body length: 3.5 mm..... **Helopeltarium**
- Clypeus not angulately expanded laterally; labrum not completely concealed under clypeus. If elytra explanate laterally, then always with striae or serial punctures..... 22
- 22 Eyes characteristically shaped, oblong ovoid (in dorsal view), narrowed posteriorly and diverging anteriorly, with a weak posterior indentation, not emarginate anteriorly, thus appearing reniform in dorsal view (Figs. 29, 30)..... 23
- Eyes not oblong ovoid (as in Figs. 29, 30), not appearing reniform in dorsal view 24
- 23 Hind corners of pronotum extended into long acute spines (Fig. 29). Body shape less convex, rather flat. Body length: 5.5 – 6.0 mm..... **Scoliopsis**
- Hind corners of pronotum not extended into long acute spines (Fig. 30). Higher convex. Body length: 2.5 – 6.5 mm **Oocyclus**
- 24 Second segment of maxillary palpi curved mediad (Figs. 31, 38)..... 25
- Second segment of maxillary palpi not curved mediad 26
- 25 Elytra with sutural stria, but without serial punctures or serial striae. Second maxillary palpomere weakly curved mediad in distal half (Fig. 38). Body length: 2.5 – 5.5 mm..... **Chasmogenus**
- Elytra either with ten rows of striae or serial punctures or entirely without striae and serial punctures, never with sutural stria. Second maxillary palpomere strongly curved mediad (Fig. 31). Body length: 2.5 – 10 mm **Helochares**
- 26 Elytra with sutural stria 27
- Elytra without sutural stria 31
- 27 Second palpomere of maxillary palpi curved laterad (Fig. 32)..... 28
- Second palpomere of maxillary palpi not curved laterad..... 29
- 28 Metafemora with hydrofuge pubescence ventrally. Mesoventrite with single median elevation. Body length: 2 – 9 mm..... **Enochrus**
- Metafemora without hydrofuge pubescence ventrally. Mesoventrite with three fine carinae. Body length: 2.9 – 3.3 mm..... **Enochrella**
- 29 Prosternum never carinate. At least one of the following three characters present: 1) Eyes protruding; 2) posterior margin of pronotum bisinuate; 3) elytra with rows of serial punctures, particularly in apical portion. Body length: 1.7 – 3.5 mm **Crenitis**
- Prosternum either carinate or flat. Eyes not protruding. Posterior margin of pronotum not bisinuate. Elytra entirely without serial punctures..... 30
- 30 Second maxillary palpomere not thicker than third (Fig. 34). Prosternum carinate. Metafemora entirely without hydrofuge pubescence. Dorsal face often with metallic lustre. Body length: 1.0 – 3.2 mm **Paracymus**
- Second maxillary palpomere always slightly swollen, a little thicker than third palpomere (Fig. 33). Prosternum not carinate. Metafemora with hydrofuge pubescence, at least on proximal portion. Dorsal face never with metallic lustre. Body length: 1.5 – 3.3 mm..... **Anacaena**
- 31 Fourth maxillary palpomere significantly enlarged, pointing laterad, forming an angle with third palpomere (Fig. 37). Body length: 1.5 – 2.2 mm **Notionotus**

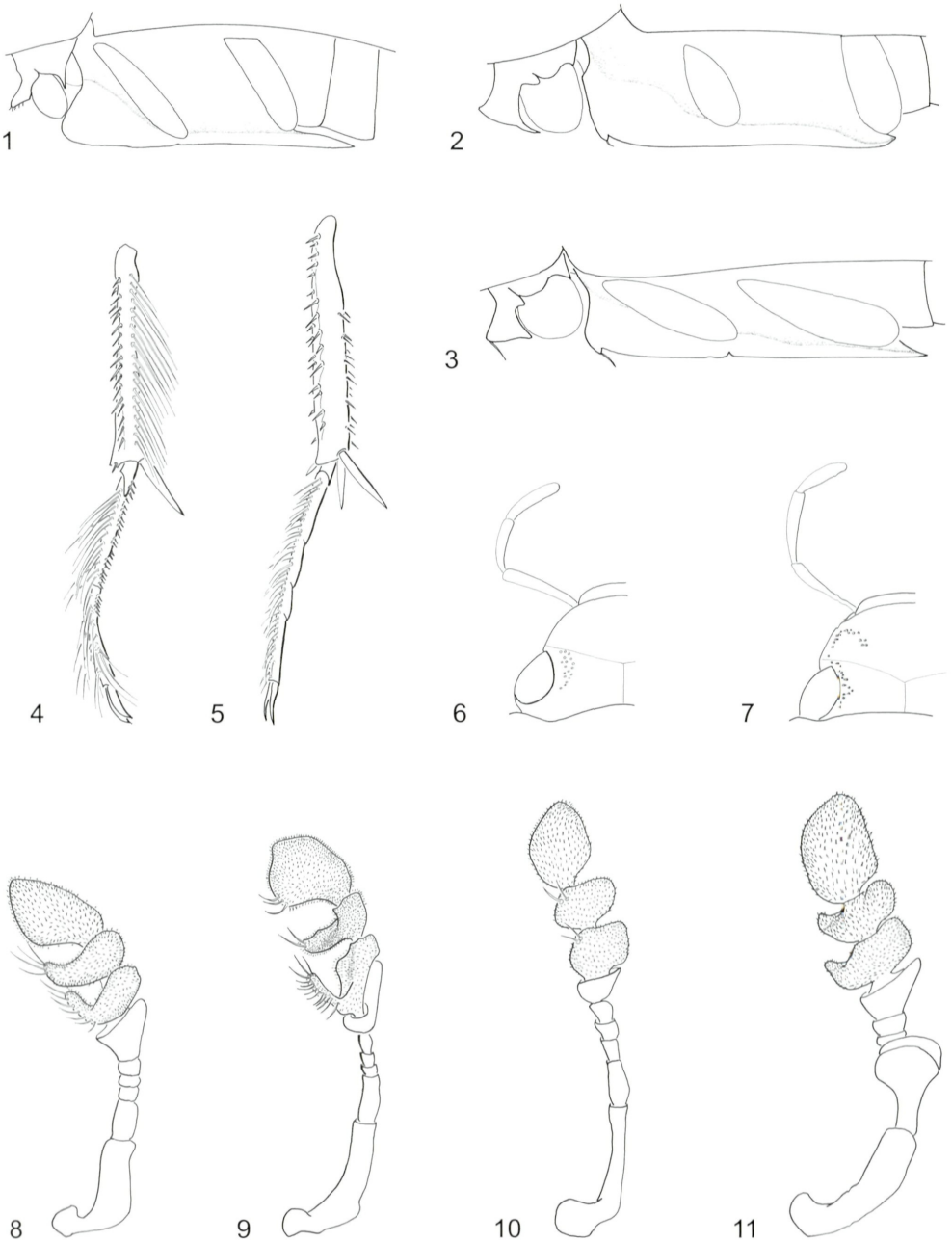
- Fourth maxillary palpomere not enlarged, not pointing laterad (Fig. 36).....32
- 32 Meso- and metaventrite with common median carina. Elytra narrowed apically (Fig. 41).
Body length: 2.8 – 4.0 mm..... *Hydrophilomima*
- Meso- and metaventrite without common median carina. Elytra not narrowed apically (Figs.
42, 43)33
- 33 Elytra with eight to ten irregular series of coarse punctures between irregular punctation (Fig.
42). Mesoventrite with transverse arcuate ridge posteromedially. Body length: 2.6 – 4.1 mm.
..... *Megagraphydrus*
- Elytra with only few rows of sparse coarser punctures between irregular punctation (Fig. 43).
Mesoventrite without transverse arcuate ridge posteromedially. Body length: 1.4 – 3.4 mm *Agraphydrus*

Acknowledgements

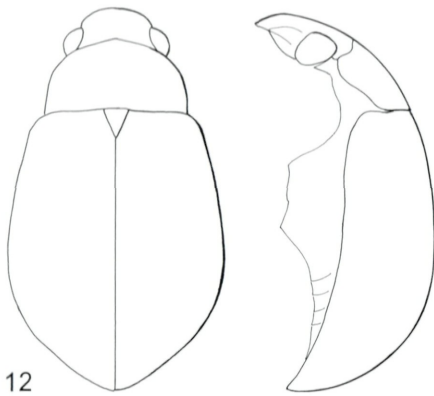
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References

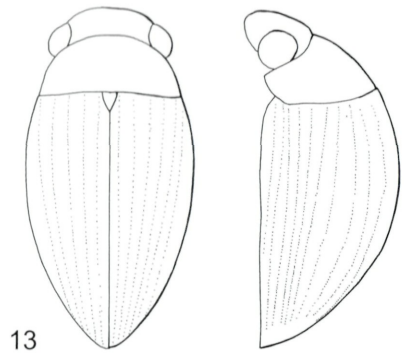
- BEUTEL, R.[G.] 1986: Skelet und Muskulatur des Kopfes und Thorax von *Hygrobia tarda* (Herbst). Ein Beitrag zur Klärung der phylogenetischen Beziehungen der Hydradephaga (Insecta: Coleoptera). - Stuttgarter Beiträge zur Naturkunde (A) 388: 1-54.
- CAMPAU, E.J. 1940: The morphology of *Chauiognathus pennsylvanicus* (De Geer) (Coleoptera: Cantharidae). - Microentomology 5: 57-85.
- GENTILI, E., HEBAUER, F., JÄCH, M.A., JI, L. & SCHÖDL, S. 1995: Check list of the Hydrophilidae recorded from China, 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. 1997: A new subfamily for a remarkable new genus and species of Hydrophilidae from New Guinea (Coleoptera: Hydrophilidae). - Annales Zoologici (Warszawa) 47: 107-110.
- HANSEN, M. 1999a: Fifteen new genera of Hydrophilidae (Coleoptera), with remarks on the generic classification of the family. - Entomologica Scandinavica 30: 121-172.
- HANSEN, M. 1999b: Hydrophiloidea (Coleoptera). In Hansen, M. (ed.): World Catalogue of Insects, Vol. 2. – Stenstrup: Apollo Books, 416 pp.
- HANSEN, M. & SCHÖDL, S. 1997: Description of *Hydrophilomima* gen.n. from Southeast Asia (Coleoptera: Hydrophilidae). - Koleopterologische Rundschau 67: 187-194.
- JIA, F. 1998: A new genus *Pseudopelthydrus* gen. n. from Hainan Island, China (Coleoptera: Hydrophilidae: Hydrophilinae). - Chinese Journal of Entomology 18: 229-230.
- Ji, L. & SCHÖDL, S. 1998: Faunistic notes on *Hydrocassis* Deyrolle & Fairmaire and *Ametor* Semenov, with descriptions of new species (Coleoptera), pp. 207-218. – In Jäch, M.A. & Ji, L. (eds.): Water Beetles of China, Vol. II. – Wien: Zoologisch-Botanische Gesellschaft in Österreich and Wiener Coleopterologenverein, 371 pp.
- LARSEN, O. 1966: On the morphology and function of the locomotor organs of the Gyrinidae and other Coleoptera. - Opuscula entomologica (Suppl.) 30: 1-241.



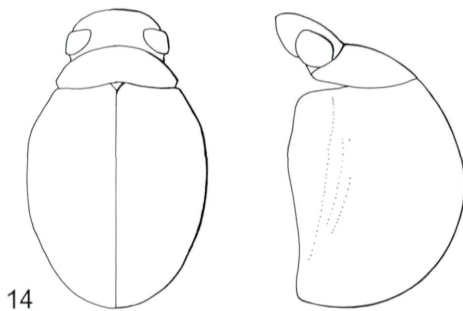
Figs. 1 - 3: Meso- and metaventral elevations (lateral view) of 1) *Hydrophilus*, 2) *Hydrobiomorpha*, 3) *Sternolophus*. Figs. 4 - 5: Metatibia and metatarsus of 4) *Berosus*, 5) *Hydrobius*.
Figs. 6 - 7: Head (dorsal view) of 6) *Sternolophus*, 7) *Hydrochara*.
Figs. 8 - 11: Antennae of 8) *Hydrophilus*, 9) *Hydrobiomorpha*, 10) *Sternolophus*, 11) *Hydrochara*.



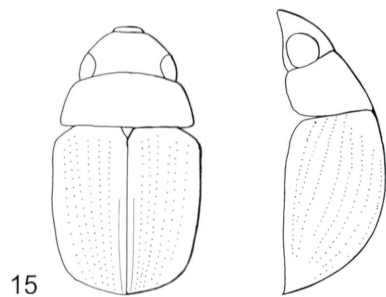
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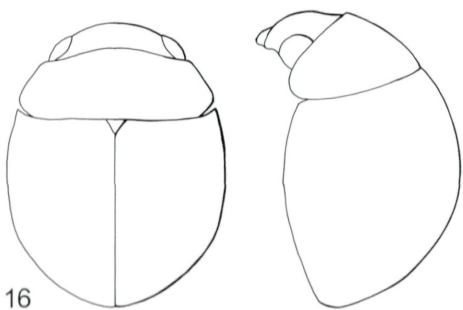
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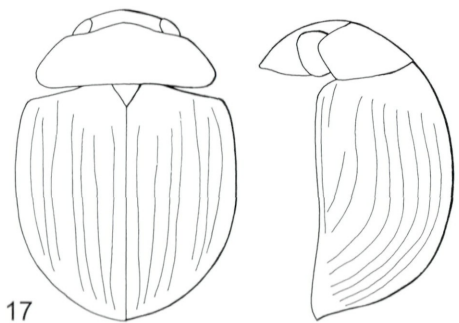
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Figs. 12 - 17: Body-outline of 12) *Berosus*, 13) *Regimbartia*, 14) *Allocotocerus*, 15) *Hemisphaera*, 16) *Chaetarthria*, 17) *Thysanarthria*.

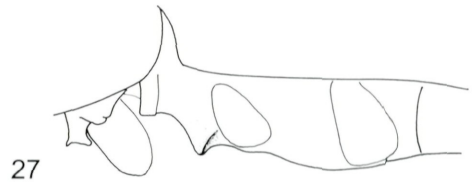
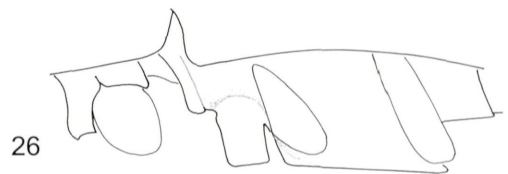
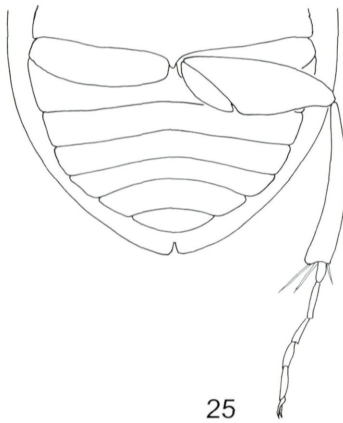
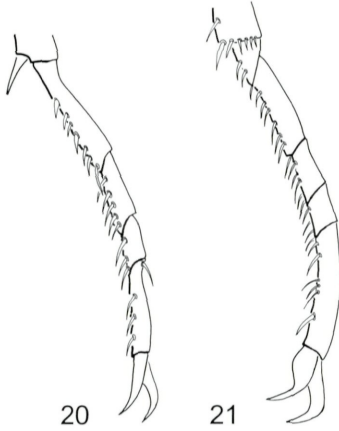
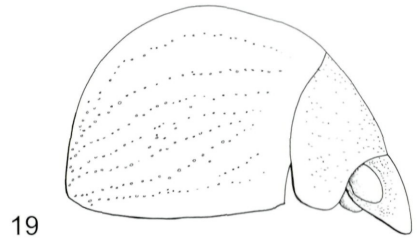
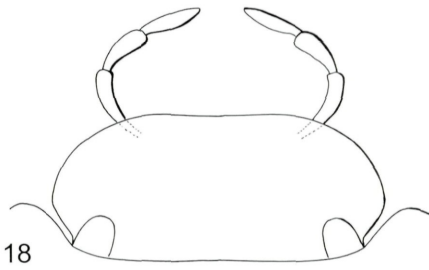


Fig. 18: Head (dorsal view) of *Helopeltarium*. Fig. 19: Body-outline (lateral view) of *Amphiops*.
Figs. 20 - 22: Metatarsus of 20) *Cymbiodyta*, 21) *Helochaeres*, 22) *Coelostoma*. Figs. 23 - 24: Antennae of
23) *Chaetarthria*, 24) *Hemisphaera*. Fig. 25: Abdomen and hind legs of *Laccobius*.
Figs. 26 - 27: Pro- and meso/metaventral elevations (lateral view) of 26) *Limnoxenus*, 27) *Hydrobius*.

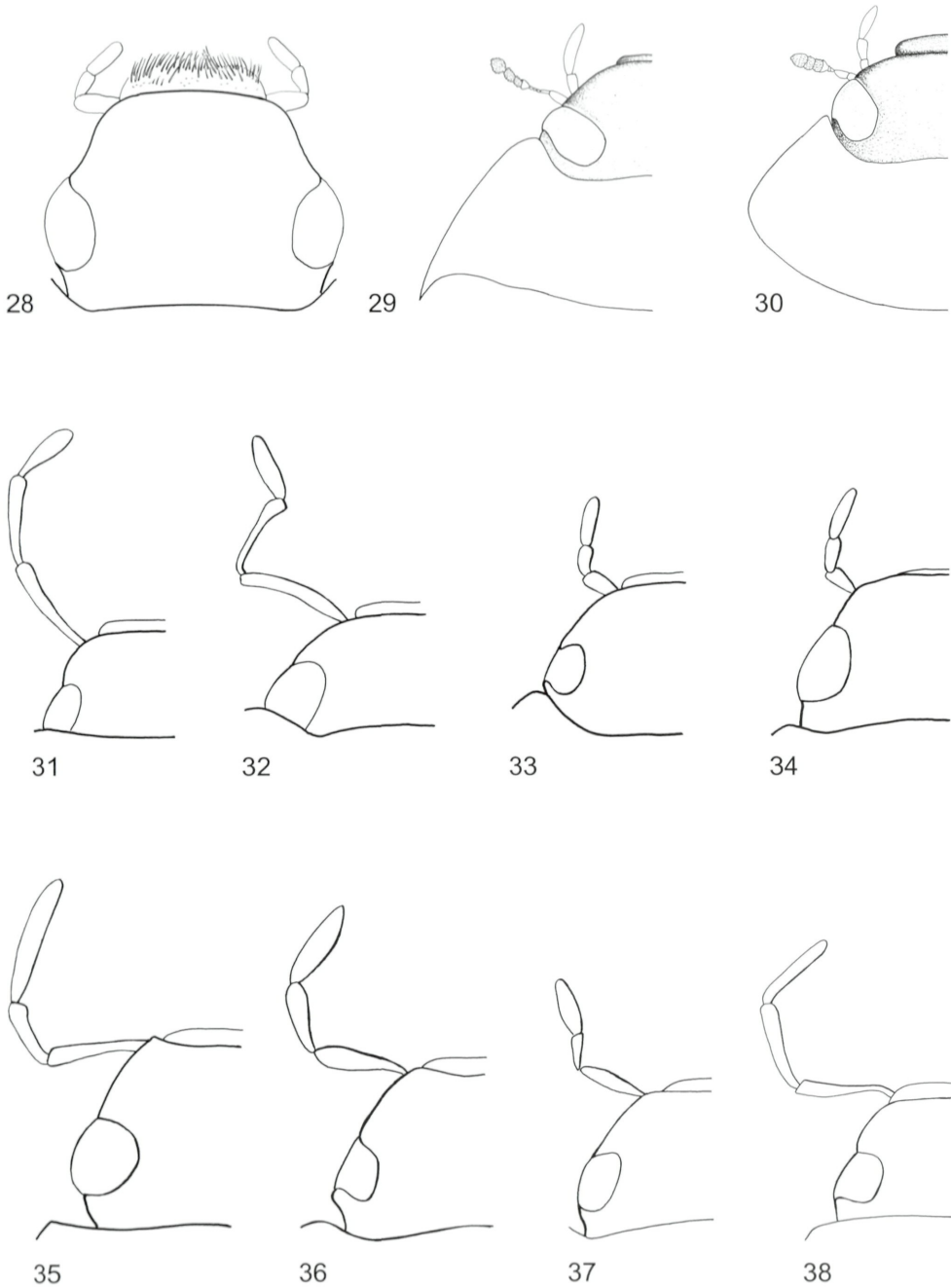
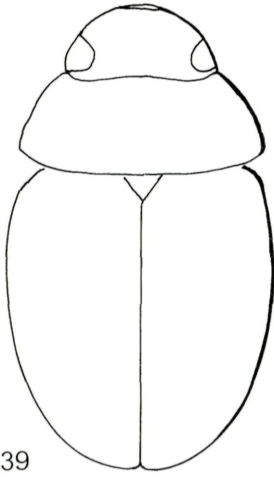
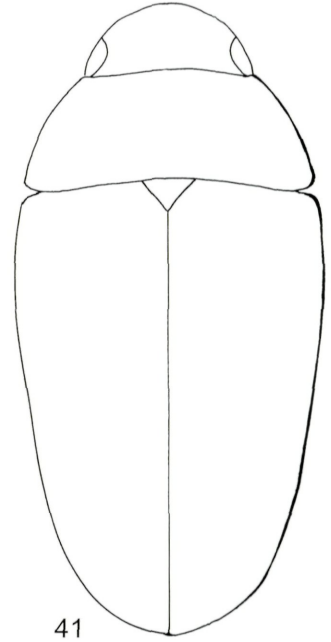


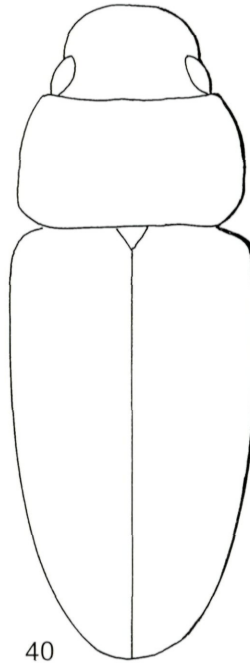
Fig. 28: Head of *Coelostoma*. Fig. 29 - 30: Head and pronotum of 29) *Scoliopsis*, 30) *Oocyclus*.
Figs. 31 - 38: Maxillary palpus of 31) *Helochaeres*, 32) *Enochrus*, 33) *Anacaena*, 34) *Paracymus*,
35) *Pelthydrus*, 36) *Agraphydrus*, 37) *Notionotus*, 38) *Chasmogenus*.



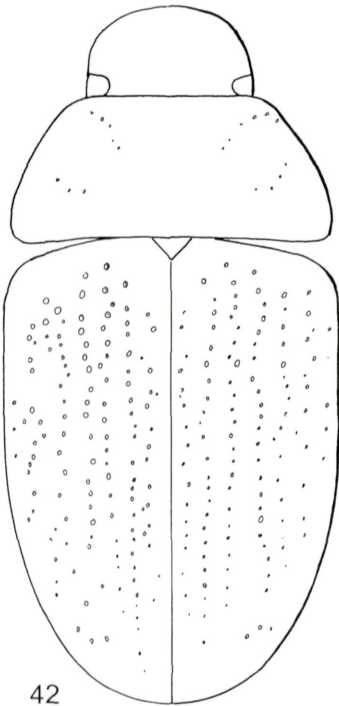
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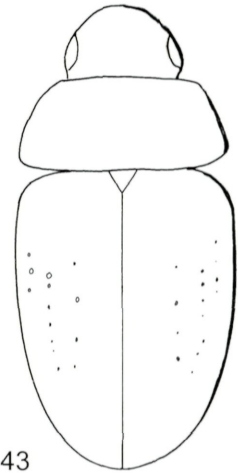
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Figs. 39 - 43: Body-outline of 39) *Notionotus*, 40) *Arabhydrus*, 41) *Hydrophilomima*, 42) *Megagraphydrus*, 43) *Agropydrus*.

- LAWRENCE, J.F. & NEWTON, A.F. 1995: Families and subfamilies of Coleoptera (with selected genera, notes, references and data on family-group names), pp. 779-1006 + 48. - In Pakaluk, J. & Ślipiński, S.A. (eds.): Biology, phylogeny and classification of Coleoptera: Papers celebrating the 80th birthday of Roy A. Crowson. - Warszawa: Muzeum i Instytut Zoologii PAN.
- MATSUDA, R. 1970: Morphology and evolution of the insect thorax. - Memoirs of the Entomological Society of Canada 76: 1-431.
- SCHÖDL, S. & JI, L. 1995: Hydrophilidae: 2. Synopsis of *Hydrocassis* Deyrolle & Fairmaire and *Ametor* Semenov, with description of three new species (Coleoptera), pp. 221-243. - In Jäch, M.A. & Ji, L. (eds.): Water Beetles of China, Vol. I. - Wien: Zoologisch-Botanische Gesellschaft in Österreich and Wiener Coleopterologenverein, 410 pp.

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