A revision of the Chinese Helochares (s. str.) Mulsant, 1844 (Coleoptera, Hydrophilidae)

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Abstract. Representatives of the subgenus Helochares (s. str.) Mulsant, 1844 of China are revised. One new species, H. (s. str.) songi sp. nov., is described from Guangxi, China. All species known from China are redescribed. A diagnosis and a differential diagnosis are provided for each species. Helochares fuliginosus d’Orchymont, 1932 is recorded for the first time from China and Cambodia. Additional distribution records of H. atropiceus Régimbart, 1903 and H. pallens (MacLeay, 1825) are provided from China. The habitus and aedeagus of all species are illustrated, and a key for the identification of Chinese species of the subgenus is provided.

Keywords. Hydrophilidae, new species, China, Oriental, Palaearctic.


Introduction

The genus Helochares Mulsant, 1844 currently contains 180 described species that are assigned to five subgenera (Hansen 1999; Short & Hebauer 2006; Short & Fikáček 2011). The genus is distributed worldwide, with the highest species diversity recorded from the Afrotropical, Oriental, Neotropical and Australian regions. Of the five subgenera, Sindolus Sharp, 1882 is known only from the Neotropical region, Helocharimorphus Kuwert, 1890 and Batochares Hansen, 1991 only from the Afrotropical region, and Hydrobatis MacLeay, 1871 and Helochares (s. str.) are known from all zoological realms. Since the publication of the World Catalogue of Hydrophiloidea (Hansen 1999), 27 new species have been described and 4 species were treated as synonyms. In the subgenus Helochares (s. str.), 10 species have been described from the Oriental, Afrotropical and Neotropical regions since 1999 (Hebauer 1999, 2001, 2002, 2003; Hebauer et al. 1999; Short 2005; Mart et al. 2010). A total of 40 species of Helochares (s. str.) have now been described, 14 of which occur in the Neotropics, 11 in the Afrotropical region, 8 in the Palearctic, 7 in the Oriental region, 3 in Australia and only 1 species in the Nearctic (Hansen 1999; Short & Hebauer 2006; Short & Fikáček 2011).
The Chinese fauna of *Helochares* (s. str.) is poorly known. Only three species have been recorded from China: *H.* (s. str.) *pallens* (MacLeay, 1825) (d’Orchymont 1935), *H.* (s. str.) *obscurus* (Müller, 1776) (Fikáček et al. 2015) and *H.* (s. str.) *atropiceus* Régimbart, 1903 (Jia et al. 2010; Fikáček et al. 2015).

**Material and methods**

Some specimens of each species were dissected. After 8–10 hours in 10% KOH at room temperature, male genitalia were transferred to a drop of distilled water, the remaining membrane was removed under a compound microscope, and the cleaned genitalia were subsequently mounted in a drop of glycerin on a piece of transparent plastic attached below the specimens. Male genitalia and morphological characters were examined using a Nikon SMZ800 compound microscope. Photographs were taken using a Zeiss Axioskop 40 compound microscope combined with AutoMontage software and a Leica M205C stereo microscope. Morphological terminology largely follows Hansen (1991) and Komarek (2004).

Examined specimens are deposited in the following collections:

- BMNH = The Natural History Museum, London, UK
- IRSN = Institut royal des Sciences naturelles, Brussels, Belgium
- KMNH = Kitakyushu Museum of Natural History and Human History, Kitakyushu, Japan
- NMPC = National Museum, Prague, Czech Republic
- SYSU = Entomological collection of Sun Yat-sen University, Guangzhou, China

Specimens for which the depository is not indicated are all deposited in SYSU.

We also checked a paratype of *Helochares* (s. str.) *vitalisi* d’Orchymont, 1919 (d’Orchymont 1919a), a species known only from Cambodia, in order to compare it with the Chinese species *H.* *songi* sp. nov. The original label for the paratype states: “Paratype: unsexed (IRSN): Long Xuyen/Cochinchine/Dorr. // H. Vitalisi/d’orchym. // Coll. d’Orchy.”

**Results**

Class Hexapoda Blainville, 1816
Order Coleoptera Linnaeus, 1758
Family Hydrophilidae, Latreille, 1802
Subfamily Acidocerinae Zaitzev, 1908
Genus *Helochares* Mulsant, 1844

Subgenus *Helochares* Mulsant, 1844

*Enhydrus* Dahl, 1823: 34 (nom. nud.).

*Enhydrus* MacLeay, 1825: 35.

*Helophilus* Mulsant, 1844: 132.

*Helochares* Mulsant, 1844: 197.

*Pylophilus* Motschulsky, 1845: 32 (type species: *Hydrophilus griseus* Fabricius, 1787).

*Peloxenus* Motschulsky, 1845: 549 (type species: *Hydrophilus griseus* Fabricius, 1787).

*Helophygas* Motschulsky, 1853: 11.


*Neohydrobius* Blackburn, 1898: 221 (type species: *Philhydrus burrundiensis* Blackburn, 1890 by monotypy). — d’Orchymont 1919c: 228 (synonymization).
Diagnosis

The following character combination can be used to separate *Helochares* (s. str.) from other subgenera of *Helochares*: (1) maxillary palps at least as long as width of head (shorter than width of head in subgenus *Helocharinomorphus*); (2) second maxillary palpomeres clearly curved inwards, apical segment at most as long as penultimate segment; (3) mesoventrite bulging medially, without strongly raised process (subgenus *Sindolus* with strongly raised process); (4) elytra without striae or serial punctures and without scutellary stria, but with rows of systematic punctures (subgenera *Hydrobaticus* and *Batochares* with 8–10 striae or series of punctures and short scutellary stria); (5) elytra without sutural striae; and (6) posterior margin of last visible abdominal sternite with apical emargination fringed with stiff yellowish setae (subgenus *Batochares* without apical emargination).

For keys to the subgenera of *Helochares* Mulsant, see Hebauer (1996) and d’Orchymont (1919b).

*Helochares songi* sp. nov.


Figs 1–8, 48–49

**Diagnosis**

Length 4.8–5.3 mm, width 2.6–2.9 mm. Dark brown or black (Fig. 1), clypeus uniformly dark brown to black (Fig. 4), anterior half of lateral margin of pronotum yellowish brown (Figs 1, 3–4, 6), elytra uniformly dark brown to black (Fig. 3). Dorsum with uniform dense and coarse ground punctures. Clypeus moderately expanded laterally, with somewhat rounded lateral margin, clearly impressed in front of eyes (Fig. 4). Maxillary palps ca 1.2 × as long as width of head, dark brown to black, each palpomere with light colour apically (Figs 1–2, 4). Pedicel subequal in length to antennomeres 3–6 combined. Submentum with a small glabrous area medially and with a few coarse punctures laterally (Fig. 5). Elytra almost parallel from base to posterior third, somewhat explanate laterally, with distinct systematic punctures (Fig. 3). Mesoventrite with a low transverse ridge medially and a low longitudinal carina (Fig. 7). Metaventrite without glabrous area medially. Femora densely pubescent except for apical eighth (Figs 2, 8). Aedeagus slender, length of paramere ca 10 × as long as width of apex (Fig. 48), subparallel, apex with a small tooth inwards (Figs 48–49); apex of median lobe slightly overlapping parameres; basal strut of median lobe long, ca $\frac{1}{2}$ × as long as parameres (Fig. 48).

**Etymology**

The specific name is given in honor of Keqing Song, the collector of the type specimens.

**Material examined**

**Holotype**

CHINA: 1 ♂, Guangxi Province, Shiwandashan, Nalin River, 316 m a.s.l., in water at edge of upper river, 21 Jul. 2011, Keqing Song leg. (SYSU).

**Paratypes** (77 spec., BMNH, KMNH, NMPC, SYSU)

Description

**Form and Colour.** Body oval, length 4.8–5.3 mm, width 2.6–2.9 mm, moderately convex. Head dark brown to black. Pronotum dark brown to black, anterior half with narrow yellowish brown lateral margins (Figs 1, 3–4, 6). Elytra uniformly dark brown to black (Figs 1, 3). Maxillary palps dark brown to black, each palpomere light yellowish brown apically (Figs 1–2, 4). Labial palpomeres yellow to yellowish brown. Antennae yellowish brown, club with dense yellow setae. Ventral side dark brown or black (Fig. 2), legs with same colour as ventral side, but with reddish to yellowish brown tarsomeres (Fig. 2).

**Head.** Labrum with fine and dense punctures, smooth between punctures, anterior margin broadly emarginate. Clypeus broad, anterior margin clearly broadly emarginate, moderately expanded in front of eyes, with somewhat rounded lateral margin (Fig. 4), clearly impressed in front of eyes (Fig. 4). Ground punctures on clypeus coarser and sparser than those on labrum, surface smooth between punctures. Systematic punctures on clypeus almost same size as ground punctures. Eyes of moderate size, clearly emarginate anteriorly (Figs 1, 4), separated by ca 4.0–4.1 × the width of one eye. Frons with slightly coarser and stronger punctures than on clypeus, with clear systematic punctures. Maxillary palps long and slender, ca 1.1–1.2 × as wide as head, second and third palpomeres curved inwards, apical palpomere almost as long as penultimate, asymmetrical (Fig. 4). Antennae with 9 antennomeres, scape ca 1.5 × as long as pedicel, pedicel subequal in length to antennomeres 3–6 combined, club loosely segmented, with dense pubescence. Mentum ca as wide as long, subquadrate, with deep v-shaped impression anteromedially, with coarse punctures and wrinkles posteriorly (Fig. 5). Submentum with a small glabrous area medially and with a few coarse punctures laterally. Maxilla with coarse punctures, smooth between punctures.

**Thorax.** Pronotum ca 2 × as wide as long, widest posteriorly, posterolateral margins broadly round, anterior margin smooth, with a very fine transverse groove, lateral margin with stronger groove, posterior margin without such groove; posterior margin almost straight. Ground punctures slightly coarser than those on head, systematic punctures on pronotum distinct, almost of same size as ground punctures (Figs 4, 6). Prosternum bulging in middle, not carinate, pubescent, with transverse groove (Fig. 5), protruding anteriorly. Mesoventrite with a low transverse ridge medially, which does not bear an elevated tooth or projection but with long setae (Fig. 7); behind ridge with a low longitudinal carina. Metaventrite pubescent, with somewhat convex middle portion, without glabrous area. Metepisterna ca 3.5 × as long as wide, subparallel. Scutellum triangular, with similar punctures to elytra. Elytra almost parallel from base to posterior third, somewhat explanate laterally, ground punctures similar to those on pronotum, with 3 distinct rows of systematic punctures (Fig. 3), without sutural stria; epipleuron very broad anteriorly, reaching posterior margin of first visible abdominal sternite, with sparse, coarse punctures. Femora densely pubescent, with apical eighth glabrous (Figs 2, 8). Metatarsomeres with dense white hairs ventrally and a few long swimming hairs dorsally. Claws of moderate size, rather strongly curved.

**Abdomen.** All visible abdominal ventrites with dense pubescence; first ventrite not carinate (Figs 2, 8).

**Aedeagus.** Slender, length of parameres ca 10 × as long as width of apex, subparallel, a little expanded subapically and round apically (Fig. 48), apex with a small, inwardly directed tooth (Figs 48–49); median lobe slightly protruding beyond parameres, gradually narrowed apically, apex ca 0.5 × as wide as apex of parameres; basal strut long, ca 1/3 × as long as parameres (Fig. 48).

**Differential diagnosis**

This species is very similar to *H. fuliginosus* d’Orchymont, 1932, but may easily be distinguished from the latter by its larger size (3.6–4.3 mm in *H. fuliginosus*), lateral margin of clypeus and elytra with same colour as disc (Fig. 4), pronotum and elytra more coarsely punctate, and maxillary palps dark.
brown or black, each palpmere with light colour apically (Figs 4–5). Aedeagus slender, parameres ca 10× as long as width of apex (Fig. 48), apex with a small inwardly directed tooth (Figs 48–49); median lobe slightly projecting beyond parameres apically (Fig. 48). It can be distinguished from *H. atropiceus* Régimbart, 1903, *H. ciniensis* Hebauer, 1999 and *H. taprobanicus* Sharp, 1890, occurring in the Oriental, by its slender aedeagus, parameres ca 10× as long as width of apex, without branches, not concave outside, apex with a small inwardly directed tooth (Figs 48–49). Hebauer (1995) described *Helochares fulgurans* based on a unique female from Thailand. *Helochares songi* sp. nov. can be distinguished from *H. fulgurans* by its larger size (3.5 mm in *H. fulgurans*), dark colour (bright yellow brown, only dark between eyes, with two dark basal spots on pronotum in *H. fulgurans*) and maxillary palps dark brown or black, each palpmere with light colour apically (yellow in *H. fulgurans*). From *H. vitalisi* d’Orchymont, 1919 (Fig. 45) it differs in having the head, pronotum and elytra with coarser punctures (ground punctures very fine in *H. vitalisi*), each maxillary palpmere with light colour apically, clypeus moderately expanded laterally, with somewhat rounded lateral margin, clearly impressed in front of eyes (clypeus not expanded laterally and not impressed in front of eyes in *H. vitalisi*) and elytra almost parallel from base to posterior third (widest at middle in *H. vitalisi*), somewhat explanate laterally (not explanate in *H. vitalisi*, as in *Enochrus*).

**Biology**

Lives along the sides of rivers with a sandy bottom and stagnant water. The female carries the egg case under the abdominal ventrites.

**Remarks**

The density is very high at the type locality, but no specimen was collected at light in July. It is probable that this species can be collected at light during its reproductive period.

**Distribution**

China (Guangxi), so far only known from the Shiwandashan National Park and its surroundings.

*Helochares fuliginosus* d’Orchymont, 1932

Figs 9–17, 44, 46–47

*Helochares (s. str.) fuliginosus* d’Orchymont, 1932: 689.

**Diagnosis**

Length 3.6–4.3 mm. Dorsum with dense and fine punctures that are finer than in *H. songi* sp. nov. Clypeus somewhat impressed in front of eyes (Figs 12, 14). Maxillary palps ca 1.2× as long as width of head, each palpmere uniformly yellowish brown (Figs 13–14). Pedicel subequal in length to antennomeres 3–6 combined. Submentum with a small glabrous area medially and with a few coarse punctures laterally (Fig. 16). Elytra almost parallel from base to posterior third, somewhat explanate laterally, with distinct systematic punctures (Fig. 9). Mesoventrite with a low transverse ridge medially and a low longitudinal carina (Fig. 15). Metaventrite without glabrous area medially. Femora densely pubescent except apical eighth (Figs 10, 17). Length of parameres ca 6.5× as long as width of apex, subparallel, slightly expanded subapically and round apically, apex without inwardly directed tooth; median lobe expanded subapically, abruptly narrowed apically (Fig. 47).

**Material examined**

**Paratype**

Other material


Redescription
FORM AND COLOUR. Length 3.6–4.3 mm, width 1.9–2.2 mm, oval, moderately convex. Head black, yellowish brown laterally (Figs 12–14); pronotum and elytra dark brown to black, both with yellowish or reddish brown margin laterally (Fig. 11); maxillary palps uniform yellow or yellowish brown (Figs 13–14); labial palps yellow, antenna yellowish brown. Ventral side dark brown to black (Fig. 10); legs dark with yellowish tarsomeres (Fig. 11).

HEAD. Labrum with fine and dense punctures, smooth between punctures, anterior margin broadly emarginate. Clypeus broad, anterior margin clearly broadly emarginate, moderately expanded in front of eyes, lateral margin somewhat rounded, clearly impressed in front of eyes (Figs 12–14). Punctures on clypeus coarser and sparser than those on labrum, smooth between punctures, systematic punctures almost of same size as ground punctures (Fig. 14). Eyes of moderate size, clearly emarginate anteriorly (Figs 12–14), separated by ca 4.0× the width of one eye. Ground punctures on frons similar to those on clypeus, with clear systematic punctures in front of eyes. Maxillary palps long and slender, ca 1.2× as wide as head, second and third palpomeres curved inwards, apical palpomere almost as long as penultimate, asymmetrical (Fig. 16). Antennae with 9 antennomeres, scape ca 1.5× as long as pedicel, pedicel subequal in length to antennomeres 3–6 combined, club loosely with dense pubescence. Mentum ca as wide as long, subquadrate, with strong v-shaped impression anteromedially, with coarse punctures and wrinkles posteriorly (Fig. 16). Submentum with a small glabrous area medially and with a few coarse punctures laterally. Maxilla with coarse punctures, smooth between punctures.

THORAX. Pronotum ca 2× as wide as long, widest posteriorly, posterolateral margins broadly round, anterior margin smooth, with a very fine transverse groove, lateral margin with stronger groove, posterior margin without such groove; posterior margin almost straight. Ground punctures on pronotum slightly coarser than on head, with distinct setiferous systematic punctures (Fig. 13). Prosternum bulging in middle, not carinate, pubescent, with transverse groove (Fig. 16), protruding anteriorly. Mesoventrite with a low transverse ridge medially, which does not bear an elevated tooth or projection but with
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a tuft of long setae (Fig. 15), behind ridge with a low longitudinal carina. Metaventrite pubescent, with somewhat convex middle portion, without glabrous area. Metepisterna ca 3.5 × as long as wide, subparallel. Scutellum triangular, with similar punctures to elytra. Elytra with ground punctures similar to those on pronotum and with 3 distinct rows of systematic punctures (Fig. 11), without sutural stria; epipleura very broad anteriorly, reaching posterior margin of first visible abdominal sternite, with sparse, coarse punctures. Femora densely pubescent, with apical eighth glabrous (Figs 10, 17). Metatarsomeres with dense white hairs ventrally and some long swimming hairs dorsally. Claws of moderate size, rather strongly curved.

**Abdomen.** All visible abdominal ventrites with dense pubescence; first ventrite not carinate (Fig. 17).

**Aedeagus.** Broad, paramere ca 6.5 × as long as width of apex, subparallel, slightly expanded subapically and round apically, apex without small, inwardly directed tooth; median lobe somewhat expanded subapically, abruptly narrowed apically (Fig. 47).

**Differential diagnosis**

This species is closest to *H. songi* sp. nov., from which it can easily be distinguished by its smaller size; clypeus yellowish brown laterally (Fig. 12–14); elytra with yellowish or reddish brown margin laterally (Fig. 11); maxillary palps uniform yellow or yellowish brown (Figs 13–14); pronotum and elytra more finely punctate; parameres ca 6.5 × as long as width of apex, apex without a small, inwardly directed tooth (Fig. 47).

**Biology**

This species occurs in small stagnant pools and on wet stones on ground with grass or leaf litter near rivers or streams, but never collected in habitats where *Oocyclus* spp. occur. It is occasionally collected at light. The female carries the egg case under the abdominal ventrites.

**Distribution**

China (Fujian, Guangdong, Guangxi, Hong Kong, Macau), Cambodia, Indonesia (Java, Sumatra), Malaysia (peninsula) (Hansen 1999). New record for China and Cambodia.

*Helochares atropiceus* Régimbart, 1903

Figs 18–25, 50–51

*Helochares* (s. str.) *atropiceus* Régimbart, 1903: 53 (specific rank confirmed by Hebauer 2001: 11; not a synonym of *H. taprobanicus* Sharp, 1890, as in Hansen 1999: 163).


**Diagnosis**

Size 5.4–6.7 mm. Dorsum with distinctly sparser and finer punctures than in *H. songi* sp. nov. (Fig. 18). Labrum and clypeus with distinct systematic punctures. Clypeus never impressed in front of eyes (Figs 20–21). Eyes not emarginate anteriorly (Figs 20–21). Maxillary palpi ca 1.6 × as long as width of head, each palpomere uniformly yellowish brown (Figs 18, 21). Antennae with pedicel distinctly shorter than antennomeres 3–6 combined. Submentum without a small glabrous area medially and with even, dense, coarse and strong punctures except extreme posterior portion (Fig. 22). Pronotum and elytra finely punctate. Mesoventrite with a stout, backwardly pointing projection, rising to level of mesocoxae, apex of the projection with a few long setae (Fig. 24). Metaventrite without glabrous area medially. Femora densely pubescent except apical eighth (Figs 19, 25). Parameres somewhat wider than widest part of median lobe, each paramere with 3 branches: inner branch short and strongly curved inwards; median branch knife-formed, sharp apically, slightly longer than outer branch; outer branch narrower
than other two branches, apical third curved inwards, sharp apically. Median lobe with broad basal half, gradually narrowed apically. Basal strut very short (Figs 50–51).

Material examined


Redescription

**Form and colour.** Body length 5.4–6.7 mm, width 3.2–3.7 mm, oval, moderately convex. Head uniformly black (Figs 18, 21); pronotum dark brown to black, usually narrowly reddish brown laterally, posterior margins usually yellow brown laterally (Figs 21, 23), elytra black, with reddish brown lateral margins (Fig. 20); antennae, maxillary and labial palps uniformly reddish or yellowish brown (Figs 18, 21). Ventral side dark brown to black, legs dark with reddish brown tarsomeres (Figs 19, 24). Immatures with reddish brown pronotum and elytra and dark brown head.

**Head.** Labrum with fine and dense punctures, smooth between punctures, with distinct systematic punctures, anterior margin broadly emarginate. Clypeus broad, with coarser and sparser punctures than those on labrum, smooth between punctures, systematic punctures distinct; anterior margin clearly emarginate, at most slightly expanded in front of eyes, never impressed in front of eyes (Figs 20–21). Eyes of moderate size, not emarginate anteriorly (Figs 20–21), separated by ca 4.0 × the width of one eye. Frons as coarse and strong punctures as clypeus, with clear systematic punctures. Maxillary palps long and slender, ca 1.6× as wide as head, second and third palpomeres curved inwards, apical palpomere ca 0.85× as long as penultimate, asymmetrical. Antennae with 9 antennomeres, scape ca 1.5× as long as pedicel, pedicel ca 3/5× as long as antennomeres 3–6 combined, club loosely segmented with dense pubescence. Mentum ca as wide as long, subquadrate, with strong v-shaped impression anteromedially, with coarse punctures, with wrinkles posteriorly (Fig. 22). Submentum without a small glabrous area medially and with even, dense, coarse and strong punctures, smooth between punctures (Fig. 22). Maxilla with a few punctures that are finer than those on submentum (Fig. 22).

**Thorax.** Pronotum ca 2× as wide as long, widest posteriorly, posterolateral margin broadly round, anterior and posterior margins smooth, with a very fine transverse groove, lateral margin with stronger
groove; posterior margin slightly bisinuate, with median portion widely curved, punctures slightly coarser than those on head, with distinct setiferous systematic punctures (Figs 20–21, 23). Prosternum bulging in middle, not carinate, pubescent, with transverse groove, protruding anteriorly (Fig. 22). Mesoventrite with a stout, backwardly pointing projection, rising to level of mesocoxae, apex of projection with a few long setae (Fig. 24). Metaventrite without glabrous area mediially; metepisterna ca 3.5 x as long as wide, subparallel. Scutellum triangular, with similar punctures to those on elytra. Ground punctures on elytra similar to those on pronotum and clearly with three distinct rows of systematic punctures (Fig. 20); epipleura very broad anteriorly, reaching posterior margin of first visible abdominal sternite, with sparse, coarse punctures. Femora densely pubescent with apical eighth glabrous (Figs 19, 25). Metatarsomeres with dense golden hairs ventrally and some long swimming hairs dorsally. Claws of moderate size, rather strongly curved.

**Abdomen.** All visible abdominal ventrites with dense pubescence; first ventrite not carinate (Fig. 25).

**Aedeagus.** Very broad. Parameres somewhat wider than widest part of median lobe, each paramere with 3 branches: inner branch short and strongly curved inwards; median branch knife-formed, sharp apically, almost as long as outer branch; outer branch narrower than other two branches, apical third curved inwards, sharp apically. Median lobe with broad basal half, gradually narrowed apically. Basal strut very short (Figs 50–51).

**Differential diagnosis**

It is very easy to distinguish this species from other species known from China by its large size, dark brown to black colour, pronotum and elytra finely punctate, mesoventrite with a stout, backwardly pointing projection, rising to the level of the mesocoxae, the apex of the projection with a few long setae, each paramere with 3 branches. For the differences between *H. atropiceus* and allied species, see Hebauer (2001).

**Biology**

Living in natural ponds with leaf litter or water grass, can sometimes be collected on wet ground with plenty of grass. It can be collected at light in May and June in South China. It has never been collected from the edges of rivers and streams. The female carries the egg case under the abdominal ventrites.

**Distribution**

China (Guangdong, Guangxi, Guizhou, Hong Kong, Jiangxi, Macau), Bangladesh, Japan (Ryukyu Islands), Malaysia, Nepal, Thailand, Vietnam (Fikáček et al. 2015; Hansen 1999). New record for Guizhou, Hong Kong and Macau.

*Helochares obscurus* (Müller, 1776) (Figs 26–31, 53–55)

*Hydromelus obscurus* Müller, 1776: 69.
*Hydrophilus erythrocephalus* Fabricius, 1792: 185.
*Hydrophilus variegatus var. variegatus* Herbst, 1797: 304.
*Helochares subcompressus* Rey, 1885: 14.
*Helochares erythrocephalus* var. *substriatus* Sahlberg, 1913: 20.

*Hydrophilus griseus* var. *variegatus* – Gyllenhall 1808: 122.
*Helophilus lividus* var. *erythrocephalus* – Mulsant 1844: 135.
*Philhydrus lividus* var. *erythrocephalus* – Gemminger & Harold 1868: 481.
Philhydrus lividus var. variegatus – Gemminger & Harold 1868: 481.
Helochares (i. sp.) erythrocephalus – Kuwert 1890: 37.
Helochares (s. str.) griseus var. substratus – Zaitzev 1908: 382.
Helochares (s. str.) obscuus – d’Orchymont 1933: 306.

Diagnosis

Length 5.0–6.4 mm. Yellowish brown to reddish brown with dark head (Fig. 26). Dorsum with dense and coarse punctures. Systematic punctures on clypeus of the same size as ground punctures. Clypeus never impressed in front of eyes (Fig. 28), lateral margin distinct narrowed anteriorly. Eyes somewhat emarginate anteriorly (Fig. 28). Maxillary palps yellowish brown with infuscate apex (Figs 28–29), ca 1.3 × as long as width of head. Antennae with pedicel slightly shorter than antennomeres 3–6 combined. Submentum with small glabrous areas medially and with uneven, dense, coarse and strong punctures (Fig. 29). Elytra usually with small glabrous areas medially and with uneven, dense, coarse and strong punctures (Fig. 28). Systematic punctures on pronotum and elytra indistinct (Figs 26, 28). Mesoventrite with a low transverse ridge medially, which does not bear an elevated tooth or projection but with a tuft of long setae (Fig. 30). Metaventrite without glabrous area medially. Femora densely pubescent except apical eighth (Figs 27, 31). Aedeagus (Figs 53–55) ca 2.4 × as long as wide. Apex of paramere dilated inwards, rounded near apex, not distinctly angular (dorsal view). Membranous inner sac with several small dentiform bulges on each side, corresponding to a number of sclerotized spines of median lobe that are visible when the median lobe is extended.

Material examined


Redescription

Form and colour. Body length 5.0–6.4 mm, width 2.4–3.1 mm, oval, moderately convex. Head yellowish to dark brown, labrum dark brown or black. Pronotum yellowish to reddish brown (Figs 26, 28). Elytra with same colour as pronotum but with some longitudinal rows of black spots (Fig. 26). Maxillary palps yellowish brown with last palpomere black apically (Figs 28–29). Antennae yellowish brown with somewhat dark club. Labial palps reddish or yellowish brown and dark apically (Figs 27–28). Ventral side dark brown, legs with apices of femora, tibiae and tarsomeres yellowish brown (Fig. 27).

Head. Labrum with fine punctures, systematic punctures detectable. Clypeus broad, anterior margin broadly emarginate, lightly expanded in front of eyes, not impressed in front of eyes (Fig. 28), with moderately coarse and dense punctures, systematic punctures of same size as ground punctures (Fig. 28). Eyes moderate in size, emarginate anteriorly; interval between eyes ca 4 × as wide as one eye. Ground punctures on frons similar to those on clypeus, systematic punctures only slightly coarser than ground punctures. Maxillary palps long and slender, ca 1.3 × as long as width of head, 1st and 2nd palpomeres curved inwards, apical palpomere a little shorter than penultimate, slightly bending inwards. Antennae with 9 antennomeres, scape ca 1.5 × as long as pedicel, pedicel almost as long as antennomeres 3–6 combined, club loosely segmented, bearing dense pubescence (Figs 27, 29). Mentum ca 1.3 × as wide as long, subquadrate, moderately impressed anteromedially, with coarse punctures and wrinkles (Fig. 29). Submentum with uneven, coarse punctures and small, glabrous areas medially (Fig. 29).

Thorax. Pronotum ca 2 × as wide as long, widest medially; anterior margin and posterior margin almost straight; with punctures as on head, systematic punctures arranged as two transverse oblique rows, almost of same size as ground punctures (Fig. 28). Prosternum bulging in middle, not carinate, with transverse groove, protruding anteriorly. Mesoventrite with a low transverse ridge medially, which does not bear
an elevated tooth or projection but with a tuft of long setae, behind the ridge, with a low, longitudinal carina between mesocoxae (Fig. 30). Metaventrite pubescent, with somewhat convex middle portion, without glabrous area; metepisterna ca. 3.5× as long as wide, subparallel. Scutellum triangular, with similar punctures to those on elytra. Ground punctures on elytra similar to those on pronotum, with 2 or 3 rows of indistinct systematic punctures (Fig. 26). Epipleura very wide anteriorly, gradually narrowed, reaching level of first visible abdominal sternite. Femora densely pubescent with apical eighth glabrous. Metatarsomeres with dense white hairs ventrally and a few long swimming hairs dorsally. Claws of moderate size, rather strongly curved.

**Abdomen.** All visible abdominal ventrites with dense pubescence; first ventrite not carinate (Fig. 31).

**Aedeagus.** Ca. 2.4× as long as wide. Apex of parameres dilated inwards, rounded near apex, not distinctly angular (dorsal view). Membranous inner sac with several small dentiform bulges on each side, corresponding to a number of sclerotized spines of median lobe, visible when median lobe is extended. Median lobe with spine-formed apex (Figs 53–55). Apex of median lobe of aedeagus (Fig. 53) damaged during our dissection of the unique male. We used the figures of Hansen (1987) here for illustration (Figs 54–55).

**Differential diagnosis**

This species can easily be distinguished from other species occurring in China by its having the pronotum and elytra yellow brown, head only dark between the eyes, elytra with some longitudinal rows of black spots, aedeagus with a membranous inner sac, median lobe with a number of sclerotized spines and with a spine-formed apex. For the differential characters between it and *H. pallens* (McLeay, 1825) see the Differential diagnosis of that species. This species is close to the Palaearctic *H. punctatus* Sharp, 1869. The differential characters were given by Hansen (1987).

**Remarks**

This species seems to live in water at the edge of dams and the margins of rivers. Other biological characters are unknown.

**Distribution**

China (Xinjiang); Palearctic: Austria, Azerbaijan, Belarus, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Iran, Israel, Italy, Kazakhstan, Latvia, Lithuania, Luxemburg, Montenegro, Netherlands, Norway, Poland, Russian Fed. (Russia, West Siberia), Slovakia, Sweden, Switzerland, Turkey, Ukraine (Fikáček et al. 2015; Hansen 1999).

*Helochares pallens* (MacLeay, 1825)  
Figs 32–42, 52

*Enhydrus pallens* MacLeay, 1825: 35.  
*Helochares parvulus* Reiche & Saulcy in Reiche, 1854: 9.  
*Helochares levisius* Sharp, 1873: 60.  
*Helochares dispar* Sharp, 1903: 7.  

*Philhydrus pallens* – Gemminger & Harold 1868: 482.  
*Philhydrus parvulus* – Gemminger & Harold 1868: 482.  
*Helochares (s. str.) levisius* – Zaitzev 1908: 382 (misspelling).  
*Enochrus (Methydrus) parvulus* – Zaitzev 1908: 384.
Enochrus (Lumetus) pallens – Zaitzev 1908: 388.
Helochares (s. str.) pallens – d’Orchymont 1926: 232.
Helochares (s. str.) pallens ssp. laeviusculus – Balfour-Browne 1950: 60.

**Diagnosis**

Length 2.8–3.4 mm. Yellowish brown with labrum and frons dark (Fig. 32). Dorsum with finer punctures (Fig. 36). Systematic punctures on clypeus slightly stronger than ground punctures. Clypeus never impressed in front of eyes, lateral margin distinctly narrowed anteriorly (Figs 35–36). Maxillary palps yellowish brown, ca 1.2× as long as width of head. Antennae with pedicel slightly shorter than antennomeres 3–6 combined. Mentum slightly impressed anteromedially, never with wrinkles (Fig. 37). Submentum with somewhat even, dense, coarse and strong punctures. Usually eight to nine striae on underside of elytra visible from dorsal side (Figs 32, 41–42). Mesoventrite without a low transverse ridge medially (Fig. 39). Metaventrite without glabrous area medially. Femora densely pubescent except apical eighth. Apex of parameres not dilated inwards, somewhat narrowly rounded near apex. Membranous inner sac with several small dentiform bulges on each side. Median lobe with sharp apex (Fig. 52).

**Material examined**

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**Redescription**

**Form and colour.** Body length 2.8–3.4 mm, width 1.4–1.7 mm, oblong, moderately convex. Head yellowish to blackish brown, usually froms dark and clypeus yellowish brown (Fig. 35), labrum blackish brown. Pronotum yellowish to reddish brown (Figs 32, 35–36). Elytra same colour but with pronotum sometimes with some black spots. Maxillary palps uniformly yellowish brown. Antennae yellowish brown with club somewhat dark. Labial palps reddish to yellowish brown. Ventral side yellowish brown or dark brown (Fig. 33), legs with apices of femora, tibiae and tarsomeres yellowish brown.

**Head.** Labrum with fine punctures, systematic punctures detectable. Clypeus broad, anterior margin broadly emarginate, slightly expanded in front of eyes, not impressed in front of eyes (Fig. 35), with fine and sparse punctures, systematic punctures slightly coarser than ground punctures. Eyes moderate in size, somewhat emarginate anteriorly, systematic punctures present; interval between eyes ca 4×
as wide as one eye. Ground punctures on frons similar to those on clypeus, systematic punctures conspicuous in front of eyes. Maxillary palps long and slender, ca 1.2 × as long as width of head, 1st and 2nd palpmere curved inwards, apical palpomere a little shorter than penultimate, slightly bending inwards. Antennae with 9 antennomeres, scape ca 1.5 × as long as pedicel, pedicel slightly shorter than antennomeres 3–6 combined, club loosely segmented, with dense pubescence. Mentum ca 1.2 × as wide as long, subquadrate, lightly impressed anteromedially, with coarse punctures, never with wrinkles (Fig. 37). Submentum with coarse punctures (Fig. 37).

THORAX. Pronotum ca 2 × as wide as long, widest basally; posterior margin slightly bisinuate with median portion widely curved; ground punctures on pronotum similar to those on head, systematic punctures arranged in two transverse rows (Figs 35–36). Prosternum slightly bulging in middle, not carinate (Fig. 38), pubescent, with transverse groove, protruding anteriorly. Mesoventrite only simply convex posteromedially, without a low transverse ridge (Fig. 39). Metaventrite pubescent, with somewhat convex middle portion, without glabrous area. Metepisterna ca 3.5 × as long as wide, subparallel. Scutellum triangular, with similar punctures as on elytra. Ground punctures on elytra similar to those on pronotum, with three conspicuous rows of systematic punctures, dorsal surface without striae but 8–9 striae on underside of elytra usually visible from dorsal side (Figs 41–42) (continuous dark lines with black spots on ventral surface of the elytra, not corresponding with real punctures on dorsal elytral surface, and sometimes not clear in old specimens). Epipleura very wide anteriorly, gradually narrowed, reaching level of first visible abdominal sternite. Femora densely pubescent with apical eighth glabrous (Figs 33, 40). Metatarsomeres with dense white hairs ventrally and some long swimming hairs dorsally. Claws of moderate size, rather strongly curved.

ABDOMEN. All visible abdominal ventrites with dense pubescence; first ventrite not carinate (Fig. 40).

AEDEAGUS. Apex of parameres not dilated inwards, somewhat narrowly rounded near apex. Membranous inner sac with several small dentiform bulges on each side. Median lobe with sharp apex, apex spine-formed (Fig. 52).

Differential diagnosis
This species may be closest to H. obscurus (Müller, 1776) based on form and colour. It can be distinguished from H. obscurus by its smaller size, dorsum with fine punctures, striae on the underside of the elytra usually visible in dorsal view, mesoventrite only simply convex posteromedially, without a transverse ridge or process pointed posteriorly, apex of parameres not dilated inwards and median lobe with a spine-formed apex.

Habitat
Wingspread and occupying typical aquatic habitats such as ponds with rotting leaves, margins of puddles and edges of rivers. It usually flies when it is collected from water and its body surface becomes drier during the daytime. Adults have strong photokinesis and sometimes hundreds of individuals appear at light.

Distribution
A key to the species of Helochares (s. str.) of China

1. Elytra with 10 striae and scutellary stria, punctures in striae coarser than systematic punctures ....
   ..............................................................................................................Subgenus Hydrobatis MacLeay, 1871
   – Elytra without striae or series of punctures except for the rows of systematic punctures, without
   scutellary stria ......(Subgenus Helochares (s. str.) Mulsant, 1844) ..............................................2

2. Size small, 2.8–3.4 mm in length. Dorsum yellowish or reddish brown with dark labrum and
   frons (Figs 32, 34), pronotum and elytra never dark brown or black. Mesonotrite only simply
   convex posteromedially, without a transverse ridge or process pointed posteriorly (Fig. 39) .......
   ...............................................................................................................................H. pallens (MacLeay, 1825)
   – Size over 3.6 mm in length. Dorsum dark brown or black, if yellowish or reddish brown, then size
   over 4.9 mm. Mesonotrite with a transverse ridge or a process (Figs 7, 15, 24, 30) ..................3

3. Dark brown or black with very fine ground punctures, clypeus with systematic punctures
   distinctly larger than ground punctation. Mesonotrite with a stout, backward pointing
   projection (Fig. 24). Parameres with 3 branches on apical third (Figs 50–51) ......................
   .....................................................................................................................H. atropiceus Régimbart, 1903
   – Dorsum yellowish brown, dark brown or black with coarser ground punctures, systematic
   punctures on clypeus almost of the same size as ground punctures. Mesonotrite with a
   transverse ridge (Figs 7, 15, 30), without backward projection. Parameres without branches
   (Figs 47–48, 52–55) .......................................................................................................................4

4. Yellowish or reddish brown with dark brown labrum, never dark brown or black (Fig. 26).
   Clypeus at most slightly expanded, not impressed in front of eyes. Elytra usually with some
   longitudinal rows of black spots (Fig. 26). Dorsum with coarser punctures, systematic punctures
   usually somewhat indistinct (Figs 26, 28). Median lobe of aedeagus with spiniform apex
   (Figs 53–55) ............................................................................................H. obscurus (Müller, 1776)
   – Dark brown or black, pronotum with yellowish brown lateral margin (Figs 1, 9). Clypeus
   more expanded, distinctly impressed in front of eyes (Figs 4, 14). Elytra without longitudinal
   rows of black spots. Median lobe of aedeagus with broad apex (Figs 47–49) .................5

5. Body length 4.8–5.3 mm. Lateral margin of clypeus and elytra with same colour as disc (Figs 1,
   3–4); pronotum and elytra more coarsely punctate; maxillary palps dark brown or black, each
   palpomere clearly lighter (Fig. 4). Aedeagus slender, parameres ca 10 × as long as width of apex,
   apex with a small dent inwards (Figs 48–49) .................................................................H. songi sp. nov.
   – Body length 3.6–4.3 mm. Clypeus and elytra with light colour laterally (Figs 11, 14); pronotum
   and elytra with finer and sparser punctures; maxillary palps uniformly yellowish brown
   (Figs 12–14). Length of parameres ca 6.5 × width of apex, subparallel, apex without small
   dent inwards (Fig. 47); median lobe expanded subapically, abruptly narrowed apically (Fig. 47) ..
   .............................................................................................................H. fuliginosus d’Orchymont, 1932

Discussion
As to the Chinese fauna of Helochares (s. str.), the diversity of Oriental components is higher than that
of Palearctic components. The representatives of this subgenus in the Palearctic are only known from
Shaanxi and Xinjiang, in which H. obscurus (Müller, 1776) is only known from Xinjiang, where it is
not common. This is probably the southernmost border of its distribution. H. pallens (MacLeay, 1825),
a very abundant species in South and Southwest China, was collected from Shaanxi at the northern foot
of the Qinling Mountains. No other material of H. pallens has been gathered at more northerly localities,
although several expeditions have sampled the area. The northernmost border of this species is probably
the Qinling Mountains. Surprisingly, no representatives of this subgenus have hitherto been found in
North and Northeast China, as well as north of the Yangtze River in Central and East China, even though many expeditions have been conducted there by the senior author. *Helochares pallens* may be expected to be found from north of the Yangtze River in the future.

The purpose of this manuscript is to contribute to our understanding of the fauna of *Helochares* (s. str.) in China. However, a phylogenetic analysis or a re-assessment of the subgenus are far beyond the scope of this work.

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