

HETEROCERIDAE:

Check list of the Heteroceridae of China and neighbouring countries, and description of two new species (Coleoptera)

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Abstract

The Heteroceridae of China and 9 neighbouring countries (Mongolia, Russian Far East, Korea, Japan, Vietnam, Thailand, Burma, Nepal, Tadjikistan) are listed. Two genera, *Littorinus* GOZIS, 1885 and *Heterocerus* FABRICIUS, 1792 and 10 species are reported from China. Two new species, *Littorinus taiwanensis* (Taiwan) and *Littorinus hiekei* (Vietnam) are described. *Heterocerus nepalensis* MASCAGNI and *Littorinus manfredjaechi* MASCAGNI are recorded for the first time from China.

Key words: Coleoptera, Heteroceridae, *Heterocerus*, *Littorinus*, new species, China, Mongolia, Russian Far East, Korea, Japan, Vietnam, Thailand, Burma, Nepal, Tadjikistan, check list

Introduction

Morphologically, the Heteroceridae are a very homogenous family due to their common habitat which consists of mud or very fine sand near stagnant or flowing water. These small insects (1 to 7.5 mm long) live and reproduce in narrow winding galleries dug in the damp ground at distances up to a few meters from the water depending on the humidity of the soil. The galleries are excavated very rapidly by the adults using their mandibles, and forelegs which are particularly robust and armed with lateral spines. The mandibles are usually more developed in the males, particularly in some of these (hypermandibulated). Waterproof hairs entirely covering the body are of particular importance. They allow the insect to float should it end up in the water.

The eggs are small, oblong and whitish. They are deposited in groups inside incubating chambers dug by the female in the damp mud.

The larvae are campodeiform with a cylindrical body and are very active both above and below ground. The larvae dig secondary galleries branching off from the incubation chamber in which they form an oval cell where they pupate at the end of the larval development.

Depending on the species, the pupa emerges after 3 to 7 days, and the imago exits through a short cylindrical passageway in the anterior part of the cell. Initially the body is pale, darkening with time. Heteroceridae generally produce several generations during a year. The adults are excellent fliers and very sensitive and strongly attracted to light (particularly UV light); they have been collected at light even several kilometers from water.

The family contains 5 genera (*Elythomerus* WATERHOUSE, *Heterocerus* FABRICIUS, *Littorinus* GOZIS, *Micilus* MULSANT & REY, *Tropicus* PACHECO) with almost 200 species.

Acronyms & CWBS localities:

CASS	California Academy of Sciences, San Francisco
CD	Coll. D. Dudgeon (NMW)
CMS	Coll. A. Mascagni, Scandicci, Italy
CSU	Coll. S. Skaliccky, Usti nad Orlici, Czech Republic

CWBS	China Water Beetle Survey
MHNG	Muséum d'Histoire naturelle de Genève, Switzerland
MNHB	Museum für Naturkunde der Humboldt-Universität zu Berlin, Germany
NMW	Naturhistorisches Museum Wien, incl. Dudgeon collection, Austria
NTU	Department of Plant Pathology & Entomology, National Taiwan University, Taipei
SMNS	Staatliches Museum für Naturkunde in Stuttgart, Germany

CWBS loc. 31: **Hunan Province**; Huaihua Prefecture; Huitong County; Guangping Township; Moshao Village, ca. 15 km W Guangping; ca. 5 km N of upper Research Station of Academia Sinica; rain water pools near small stream, ca. 350 m a.s.l.; 4.XI.1993; leg. Schönmann, Schillhammer & Ji

CWBS loc. 64: **Liaoning Province**; Shenyang City Region; ca. 3 km S Shenyang City; small, shallow, unshaded, rain water and ground water pools at bank of Hun He (Muddy River); 14.VIII.1994; leg. Jäch, Ji & Wang

CWBS loc. 103: **Liaoning Province**; Fushun City Region; Xinbin County; 80 km NE Fushun City; 3 km E Cangshi Town; Hun He, ca. 60 m wide, fast flowing, unshaded, gravel and mud, including gravel pools, ca. 20°C, slightly polluted, ca. 80 m a.s.l.; 11.IX.1994; leg. Ji & Wang

CWBS loc. 110: **Liaoning Province**; Fushun City Region; Qingyuang County; 120 km NE Fushun City; 3 km E Douhutun Town; small stream, ca. 0.5 m wide, near rice field, slowly flowing, mud, warm, unshaded, slightly polluted, ca. 100 m a.s.l.; 12.IX.1994; leg. Ji & Wang

CWBS loc. 130: **Shandong Province**; Yantai Prefecture; Zhaoyuan County; 12 km NE Zhaoyuan City; on the way to Luo Shan, 4 km NE Zhaoyuan City; small river, slowly flowing, unshaded, margin with gravel and mud, slightly polluted, ca. 18°C, *Populus* sp. and *Salix* sp. growing along the river; 14.X.1994; leg. Ji & Wang

CWBS loc. 135: **Shandong Province**; Tai'an Prefecture; Tai Shan Nature Reserve; 4 km N Tai'an City; Longtan Shuiku (= Dragon Pond Reservoir), granite, margin with stones, mud, decaying plant material, slightly polluted, ca. 15°C, surrounding vegetation composed of *Maackia* sp., *Populus* sp., *Quercus* sp. and *Platycladus* sp., ca. 200 m a.s.l.; 18.X.1994; leg. Ji & Wang

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Check lists of the Heteroceridae of China and neighbouring countries

The following check lists are based on literature records and on material deposited in the collections mentioned above. The material of the CWBS (deposited in the NMW) is also included.

A. China:

1. *Heterocerus fenestratus* THUNBERG, 1784

Hunan, Huitong, leg. L. Ji 1992 (NMW, CMS); Shandong, CWBS loc. 130 (NMW, CMS); CWBS loc. 135 (NMW); Liaoning, CWBS loc. 64 (NMW, CASS, CMS); CWBS loc. 103 (NMW, CMS); CWBS loc. 110 (NMW); NE China (Li 1992).

2. *Heterocerus infuscatus* GROUVELLE, 1911

Yunnan (WU 1933, 1937).

3. *Heterocerus japonicus* KÔNO, 1958

Liaoning (Li 1992).

4. *Heterocerus nepalensis* MASCAGNI, 1993a

Hong Kong, Tai Po Kau (NMW).

5. *Heterocerus stultus* GROUVELLE, 1915

"China" (GROUVELLE 1915).

6. *Littorimus dilutissimus* (REITTER, 1887)

Xinjiang, "Chinese Turkestan" (REITTER 1887).

7. *Littorimus holdhausi* (MAMITZA, 1907)

Heilongjiang, Ussuri river (MASCAGNI 1991a). Holotype ("Ussuri-Geb. Kasakewitsch Korb, 1907") and 14 paratypes in NMW.

8. *Littorimus manfredjaechi* MASCAGNI, 1995

Hunan, CWBS loc. 31 (NMW, CMS).

9. *Littorimus sinensis* (GROUVELLE, 1896 b)

Beijing (GROUVELLE 1896 b); Shandong, Yantai Shi (CMS); Henan, "Lungmen, Honanfu" [= Longmen near Louyang] (MNHB).

10. *Littorimus taiwanensis* sp.n.**Holotype** (♂): "Taiwan, Hsinchu Hsien Shangping, 31.3.1991, leg. M.L. Jeng" in NMW. **Allotype** (♀): from the same locality (NMW). **Paratypes**: 8 exs. from the same locality (NMW, CMS, NTU).

3.5 - 4.2 mm long. Probably related to the *L. hispidulus* group by the male genitalia (Fig. 1). Head black, pubescence whitish with hairs longer on the sides; mandibles dentate with acute apex; antennae with 11 segments, apical 7 clubbed. Pronotum black, narrowing strongly anteriorly and bordered posteriorly; dense whitish pubescence with hairs longer on the sides; densely dotted. Elytra pubescent with some longer and straighter hairs, black, no elytral markings, irregularly punctate. Legs orange with whitish hairs; tibiae with numerous spines. Abdomen brown with orange border; stridulatory arch marked; post-metacoxal line present; thick whitish hairs with some long. Aedeagus 0.8 mm long, as in Fig. 1.

Distribution: known only from Taiwan.

Etymology: named in reference to its origin.

B. Mongolia:**1. *Heterocerus fenestratus* THUNBERG, 1784**

Chentej aimak, 15 km E Öndörchaan, 1 km S Kerulen; Cojbalsan aimak, Somon Chalchingol; Cojbalsan aimak, 32 km SE Somon Bajannuur; Chövsgöl aimak, 7 km WSW Somon Cecerleg at River Tesijn gol; Bulgan aimak, 11 km W Somon Bajannuur at Lake Bajan nuur (CHARPENTIER 1979).

2. *Heterocerus flexuosus* STEPHENS, 1828

Cojbalsan aimak, SW corner Lake Bujr nuur; Cojbalsan aimak, Chamardavaa-uul, 80 km SE Somon Chalchingol; Chovd aimak, Jamatin Dolon, 40 km N Somon Manchan at the SW corner of Char us nuur (CHARPENTIER 1979).

3. *Heterocerus kaszabi* CHARPENTIER, 1979

Cojbalsan aimak, SW corner Lake Bujr nuur; Eastgobi aimak, 3 km E Zuun-Bajan; Bajanchongor aimak, SE corner Lake Orog nuur; Cojbalsan aimak, Menengijn valley, 80 km WSW the SW end of Lake Bujr nuur (CHARPENTIER 1979).

4. *Heterocerus obsoletus* CURTIS, 1828

Central aimak, 2-7 km W Somon Lun; Chovd aimak, Jamatin Dolon, 40 km N Somon Manchan at the SW corner Char us nuur (CHARPENTIER 1979).

5. *Heterocerus parallelus* GEBLER, 1830

Chentej aimak, 7 km NE Somon Mörön; Chentej aimak, 15 km E Öndörchaan, 1 km S Kerulen; Sucheabaator aimak, Molcog elis, 2 km S Somon Dariganga; Cojbalsan aimak, SW corner Lake Bujr nuur; Cojbalsan aimak, Chamardavaa uul, 80 km SE Somon Chalchingol; Cojbalsan aimak, Somon Chalchingol; Cojbalsan aimak, Menengijn valley, 80 km WSW of SW corner Lake Bujr nuur; Chentej aimak, 10 km N Somon Delgerchaan; Bulgan aimak, 20 km W Somon Bajannuur; Chovd aimak, 10 km SSW Somon Bulgan; Chovd aimak, Jamatin Dolon, 40 km N Somon Manchan at the SW corner of Char us nuur; Central aimak, Tola valley between Somon Altanbulag and Somon Tariat, 30 km ENE Tariat; Bulgan aimak, 11 km W Somon Bajannuur at Lake Bajan nuur; Central aimak, 25 km E Somon Lun; Cojbalsan aimak, Cojbalsan (CHARPENTIER 1979).

6. *Littorimus intermedius* (KIESENWETTER, 1843)

Central aimak, 12 km SE Ulan-Baator, Nucht i. Bogdo ul; Uburchangaj aimak, Changai mountains, Ongijn gol,

10 km ENE Arbajcher; Chövsgöl aimak, 7 km WSW Somon Ceccerleg at River Tesijn gol (CHARPENTIER 1979).

7. *Littorinus interspidulus* (CHARPENTIER, 1979)

Central aimak, Songino, 24 km SW Ulan-Baator; Bajanchongor aimak, 4 km S Somon Zinst, Tujn gol; Central aimak, Kerulen, 45 km E Somon Bajandelger; Central aimak, Ulan-Baator Zaisan in Bogdo uul; Chovd aimak, at river Bulgan gol ca 15 km N Somon Bulgan; Uvs aimak, at river Baruunturuun gol, downstream Somon Baruunturuun; Chövsgöl aimak, 8 km N Somon Burenchaan at river Delger mörön (CHARPENTIER 1979).

8. *Littorinus marmota* (KIESENWETTER, 1850)

Chovd aimak, 3 km N Somon Uenc gol; Bulgan aimak, 11 km W Somon Bajannuur at Lake Bajan nuur (CHARPENTIER 1979).

C. Russian Far East:

1. *Heterocerus fenestratus* THUNBERG, 1784

Siberia (CHARPENTIER 1979).

2. *Heterocerus kamtschaticus* EGOROV, 1989

Kamtschatka (EGOROV 1989).

3. *Heterocerus obsoletus* CURTIS 1828

Southern Siberia (CHARPENTIER 1979).

4. *Heterocerus parallelus* GEBLER, 1830

Siberia (CHARPENTIER 1979).

5. *Littorinus holdhausi* (MAMITZA, 1907)

Ussuri river (15 syntypes in NMW) (MASCAGNI 1991a). This species was omitted by EGOROV (1989).

6. *Littorinus intermedius* (KIESENWETTER, 1843)

Kamtschatka (MOTSCHULSKY 1854); Siberia (CHARPENTIER 1979).

D. Korea:

1. *Heterocerus fenestratus* THUNBERG, 1784

Korea (CHARPENTIER 1979).

2. *Heterocerus marginatus* (FABRICIUS, 1787)

Korea (STRIEN 1980).

3. *Littorinus koreanus* SKALICKY, 1994

Posong, prov. Cholla-Namdo (SKALICKY 1994).

4. *Littorinus mascagnii* SKALICKY, 1994

Posong, prov. Cholla-Namdo (SKALICKY 1994).

E. Japan:

1. *Heterocerus fenestratus* THUNBERG, 1784

Okinawa, Iriomote, Ohara (NMW, CMS); Mt. Rokkonear Kobe (CSU).

2. *Littorinus japonicus* (KÔNO, 1950)

Tochigi pref., Nasu Machi, Sabi river (NMW).

3. *Littorinus tokejii* (NOMURA, 1958)

Japan (NAKANE et al. 1984).

F. Vietnam:

1. *Heterocerus fenestratus* THUNBERG, 1784

Hanoi (NMW, CMS); Thanh Moi (MHNG); "Tonkin" (CHARPENTIER 1979).

2. *Heterocerus nepalensis* MASCAGNI, 1993a

Hanoi (NMW); Cuc Phuong (NMW, CMS).

3. *Littorimus anulatus* (MASCAGNI, 1991b)

Hanoi (NMW).

4. *Littorimus hiecki* sp.n.

Holotype ♂: "Central-Tonkin, Chiem-Hoa, Aug-Sept, *Heterocerus* Fruhstorfer" in MNHB. **Allotype** ♀: "Hanoi, Tonkin, H. Perrot, in coll. M. Curti, 1991" in MHNG. **Paratypes**: 5 exs. from the same locality as allotype (MHNG, CMS) and 1 ex. from the same locality as holotype (CMS).

2.5 - 3.0 mm long. Probably related to *Littorimus luciae* MASCAGNI from which it differs in the elytral pattern and in the male genitalia (Fig. 2). Head dark brown, pubescence whitish with hairs longer on the sides; mandibles dentate with acute apex; antennae with 11 segments, apical 7 clubbed. Pronotum dark brown, narrowing strongly anteriorly and bordered posteriorly; dense whitish pubescence; densely dotted. Elytra pubescent with some longer and straighter hairs; elytral markings as in Fig. 3; regularly punctate. Legs orange with whitish hairs; tibiae with numerous spines. Abdomen orange; stridulatory arch marked with striae; post-metacoxal line present; pubescence not dense and with some long setae. Aedeagus 0.5 mm long, as in Fig. 2.

Distribution: only known from Vietnam.

Etymology: The new species is dedicated to Dr. F. Hieke (MNHB).

5. *Littorimus infimus* (FAIRMAIRE, 1888)

"Tonkin" (FAIRMAIRE 1888).

G. Thailand:**1. *Heterocerus lorenzevae* MASCAGNI, 1993b**

Lan-Sak; Krok-Phra; Lom-Sak (MASCAGNI 1993b).

2. *Heterocerus nepalensis* MASCAGNI, 1993a

Changwat Chiang Mai; Krok-Phra; Lan-Sak (SMNS, CMS); Tham Tharn Lot; Kanchanaburi; Chiang Mai, Zoo (NMW, MHNG); Doi Suthep; Huay Yang Nat. Park, Waterfall Thap Sake; Khlong Nakha Wildlife Sanctuary, Kapoe Dist. (MHNG).

3. *Heterocerus philippensis* ssp. *thieleni* MASCAGNI, 1993b

Lom-Sak (MASCAGNI 1993b); Khon Kaen (MNHB, CMS).

4. *Littorimus conjungens* (GROUVELLE, 1904)

Bangkok (GROUVELLE 1904).

5. *Littorimus gabriellae* MASCAGNI, 1993b

Chiang Mai; Lan-Sak; Krok-Phra (MASCAGNI 1993b).

6. *Littorimus luciae* MASCAGNI, 1993b

Changwat Roi Et; Kaset Wisai; Lom-Sak (MASCAGNI 1993b).

H. Burma:**1. *Heterocerus birmanicus* GROUVELLE, 1896 b**

Rangoon (GROUVELLE 1896 b).

2. *Littorimus atratus* (GROUVELLE, 1896 b)

Kathã; Shwegoo Myo; Myeen Kyan (GROUVELLE 1896 b).

3. *Littorimus feai* (GROUVELLE, 1896 b)

Myeenkyan; Yenang-Young; Kathã; Sennigion (GROUVELLE 1896 b).

4. *Littorimus grohmanni* (MASCAGNI, 1987)

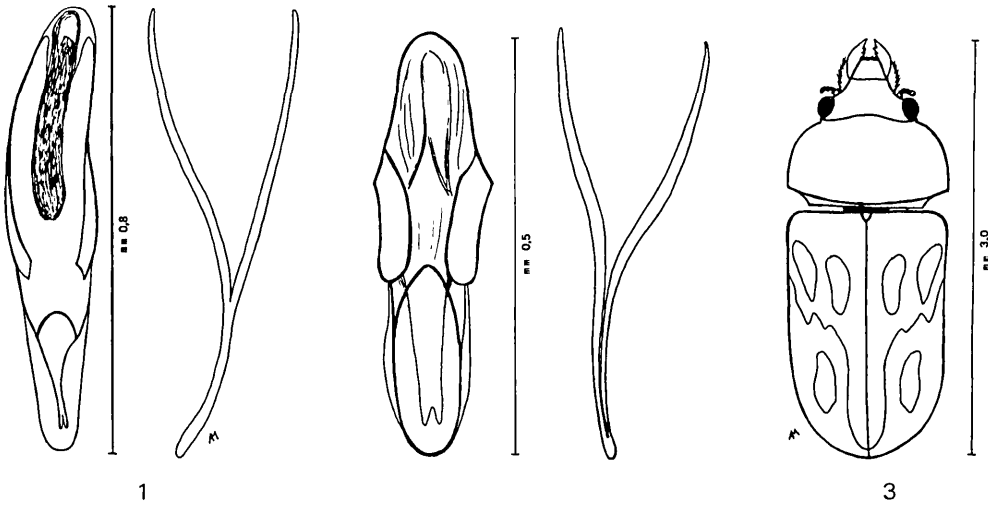
Mandalay (MASCAGNI 1987).

5. *Littorimus indicus* (MOTSCHULSKY, 1858)

Kathã; Myeenkyan (MASCAGNI 1991b).

6. *Littorimus suturalis* (GROUVELLE, 1896 b)

Mandalay; Kathã; Sennigion (GROUVELLE 1896 b).



Figs. 1: *Littorimus taiwanensis* sp.n., holotype, aedeagus and 9th abdominal sternite.
Figs. 2 - 3: *Littorimus hiecki* sp.n., holotype, 2) aedeagus and 9th abdominal sternite, 3) habitus.

I. N e p a l:

- 1. *Heterocerus fulvipes* MILLER, 1995**
Birganj Lothar, Simra Abhabhar (MILLER 1995).
- 2. *Heterocerus nepalensis* MASCAGNI, 1993a**
Parwanipur Farm, Birganj; Janakpur (MASCAGNI 1993a).
- 3. *Littorimus cantus* MILLER, 1995**
Birganj Lothar, Simra Adhabhar, Kathmandu Godavari (MILLER 1995).
- 4. *Littorimus feai* (GROUVELLE, 1896 b)**
Kathmandu (CMS); Patan; Parwanipur Farm; Birganj (MASCAGNI 1993a).
- 5. *Littorimus ivojenisi* MASCAGNI, 1995**
Sauraha (MASCAGNI 1995).
- 6. *Littorimus kaalo* MASCAGNI, 1995**
Sauraha; Gorkha (MASCAGNI 1995).
- 7. *Littorimus manfredjaechi* MASCAGNI, 1995**
Sauraha; Dahrn (MASCAGNI 1995).
- 8. *Littorimus martensi* (MASCAGNI, 1990)**
Ilam Distr., Mai Khola Valley (MASCAGNI 1990).
- 9. *Littorimus modicus* MILLER, 1995**
Birganj Lothar, 4 mi N Simra, Ktmnd. Adhabhar (MILLER 1995).
- 10. *Littorimus repexus* MILLER, 1995**
Birganj Lothar (MILLER 1995).
- 11. *Littorimus saano* MASCAGNI, 1995**
Sauraha (MASCAGNI 1995).
- 12. *Littorimus schawalleri* (MASCAGNI, 1990)**
Ilam Distr., Nodia Khola Valley (MASCAGNI 1990); Biratnagar (CSU).

13. *Littorimus siyo* MASCAGNI, 1995

Sauraha (MASCAGNI 1995).

14. *Littorimus terzanii* MASCAGNI, 1995

Sauraha; Palpa, Ramdighat, Kali Gandaki (MASCAGNI 1995).

15. *Littorimus uncis* MILLER, 1995

Birganj Lothar, Simra Adhabbar (MILLER 1995).

J. T a d z h i k i s t a n :**1. *Heterocerus fenestratus* THUNBERG, 1784**

Sarafschan, Ura-Tjube (NMW, SMNS, CMS).

2. *Heterocerus mus* CHARPENTIER, 1965

Sarafschan, Ura-Tjube (NMW, SMNS, CMS).

3. *Heterocerus obsoletus* CURTIS, 1828

Sarafschan, Ura-Tjube (NMW, SMNS, CMS).

4. *Littorimus flavidus* (ROSSI, 1794)

Sarafschan, Ura-Tjube (NMW, SMNS, CMS).

Discussion

Two genera - *Littorimus* and *Heterocerus* - and 10 species are known from China. However, there should be many more species considering the number of species present in the bordering nations which have been investigated more thoroughly: Mongolia (8 species), Burma (6 species), Thailand (6 species), Nepal (15 species). The reason for the small number of species known from China is to be attributed to the limited research. Furthermore, as China includes both the Palearctic and the Oriental region, species typical of both regions should be present: this is not obvious at present. In fact, of the 15 Palearctic species found in countries to the north and of the 30 Oriental species found in countries to the south only four species have been collected in China (Palearctic species: *Heterocerus fenestratus* and *Littorimus japonicus*; Oriental species: *Heterocerus nepalensis* and *Littorimus manfredjaechi*). Six species are regarded as endemic to China (*Littorimus dilutissimus*, *Littorimus holdhausi*, *Littorimus sinensis*, *Littorimus taiwanensis*, *Heterocerus infuscatus*, *Heterocerus stultus*).

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This bibliography is a compilation of all relevant papers on the Heteroceridae of China and neighbouring areas. Some of these references are not cited in the text.

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