

DYTISCIDAE:
I. The Chinese species of *Microdytes* BALFOUR-BROWNE
with description of a new species
(Coleoptera)

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Abstract

The Chinese species of *Microdytes* (Coleoptera: Dytiscidae) are reviewed. New faunistic records are given. A key to the Chinese species known so far is compiled. A new species, *M. lotteae*, is described.

Key words: Coleoptera, Dytiscidae, Hyphyrini, *Microdytes*, China, new species, taxonomy.

Introduction

According to WEWALKA (1997) and WEWALKA & WANG (1998) 33 species of *Microdytes* BALFOUR-BROWNE (sensu BISTRÖM, NILSSON & WEWALKA 1997) are known so far. Six of these species occur in China. Hydro-entomological expeditions to China (including the China Water Beetle Survey - CWBS) revealed new records and a new species which raises the number of Chinese *Microdytes* to seven and the known species of the genus to 34. An additional species represented by female specimens only was found in Yunnan. However, further new species of this genus can be expected.

Material, acronyms and CWBS localities

The study material which consists of about 110 specimens is deposited in the following institutions and private collection:

- CASS Chinese Academy of Sciences, Institute of Applied Ecology, Shenyang
- CBP Coll. Bilton, Plymouth, UK
- CCS Coll. Challet, Santa Ana, California, USA
- CNU Coll. Nilsson, Umeå, Sweden
- CSN Coll. M. Satô, Nagoya, Japan
- CWW Coll. Wewalka, Wien, Austria
- FMH Finnish Museum of Natural History, Helsinki, Finland
- NMW Naturhistorisches Museum, Wien, Austria
- NSMT National Science Museum, Tokyo, Japan
- NTUT National Taiwan University, Taipei, Taiwan

CWBS loc. 22: **Hunan Province**; Xiangxi Prefecture; Dayong County; Zhangjiajie Forest National Park, Suoxiyü Nature Reserve, Wulingyuan section (ca. 30 km N Dayong City); ca. 500 m upstream of Shuiraosimen bus station; tributary of Jinbian Xi [= Gold Whip River], slowly flowing, 0.5 - 1.0 m wide; 30.X.1993; leg. Schönmann, Schillhammer & Ji.

- CWBS loc. 25: **Hunan Province**; Xiangxi Prefecture; Dayong County; Zhangjiajie Forest National Park, Suoxiyü Nature Reserve, Wulingyüan section (ca. 30 km N Dayong City); ca. 3 km upstream of Suoxiyü City; small tributary of Suo Xi, partly shaded, with large boulders, small waterfalls and pools, ca. 450 m a.s.l.; 31.X.1993; leg. Schönmann, Schillhammer & Ji.
- CWBS loc. 32: **Hunan Province**; Huaihua Prefecture; Huitong County; Jinlong Shan [= Golden Dragon Mountain]; ca. 30 km NE Huitong City; forest stream, ca. 2 - 3 m wide, shaded, large boulders, small waterfalls and flat stretches with shingle and moss-covered stones, pools and accumulations of decaying plant material, upper reaches through broadleaf forest, lower reaches through *Cunninghamia* forest, amphibolite, ca. 600 - 650 m a.s.l.; 5.XI.1993; leg. Schönmann, Schillhammer & Ji.
- CWBS loc. 194: **Hainan Province**; Qiongzong County; stream, ca. 5 m wide, densely shaded, flowing partly through deep gorge, through primary forest, above Wuzhi Shan Resort; ca. 700 - 800 m a.s.l.; 18.I.1996; leg. Jäch, Ji & Wang.
- CWBS loc. 210: **Hainan Province**; Ledong County; Jianfeng Mountains; Tian Chi Botanical Garden; springfed pool, ca. 10 cm deep, 0.5 m² large, shaded, in degraded primary forest, ca. 800 m a.s.l.; 23.I.1996; leg. Jäch, Ji & Wang (see JÄCH & Ji 1998: Fig. 8).
- CWBS loc. 240: **Fujian Province**; Jianyuan Prefecture; Chong'an City Region; ca. 1 km W Wuyi Gong Village [= Shanqian, ca. 10 km S Chong'an City]; residual pools in dry riverbed in steep valley, crystalline rock, 200 - 250 m a.s.l.; 15. and 18.I.1997; leg. Schönmann, Ji & Wang.
- CWBS loc. 243: **Fujian Province**; Jianyuan Prefecture; Chong'an City Region; ca. 3 km SW Wuyi Gong Village [= Shanqian], ca. 10 km S Chong'an City; small springfed pool (ca. 0.5 m²) on a slope with plum tree plantations near CWBS loc. 242, ca. 250 m a.s.l.; 16.I.1997; leg. Schönmann, Ji & Wang (see JÄCH & Ji 1998: Fig. 13).
- CWBS loc. 248: **Fujian Province**; Jianyuan Prefecture; Chong'an City Region; ca. 3 km W Wuyi Gong Village [= Shanqian], ca. 10 km S Chong'an City; very small stream, only a few cm wide, upper part of stream forming CWBS loc. 240, shaded by bushes, long and narrow pools with almost stagnant water, short sections with slowly flowing water, gravel and sand, many algae, 350 - 400 m a.s.l.; 18.I.1997; leg. Schönmann, Ji & Wang.
- CWBS loc. 284: **Anhui Province**; Weizhou Prefecture; Huang Shan [= Yellow Mountains] National Park; Qi Yun Shan [= Cloudy Mountains] near Yan Qian, 30 km W Huang Shan City [= Tunxi]; stream, < 0.5 m wide, running over conglomerate rock in a gorge, densely shaded, more or less dried out, residual pools, 500 m a.s.l.; 24.X.1997; leg. Schönmann & Wang.
- CWBS loc. 285: **Anhui Province**; Weizhou Prefecture; Huang Shan NP; Qi Yun Shan near Yan Qian, 30 km W Huang Shan City [= Tunxi]; small stream, < 0.5 m wide, conglomerate rock, sand and gravel, deep residual pools (2 - 3 m wide) and small waterfalls, 250 m a.s.l.; 24.X.1997; leg. Schönmann & Wang.

Chinese species (in alphabetic order)

Microdytes bistroemi WEWALKA

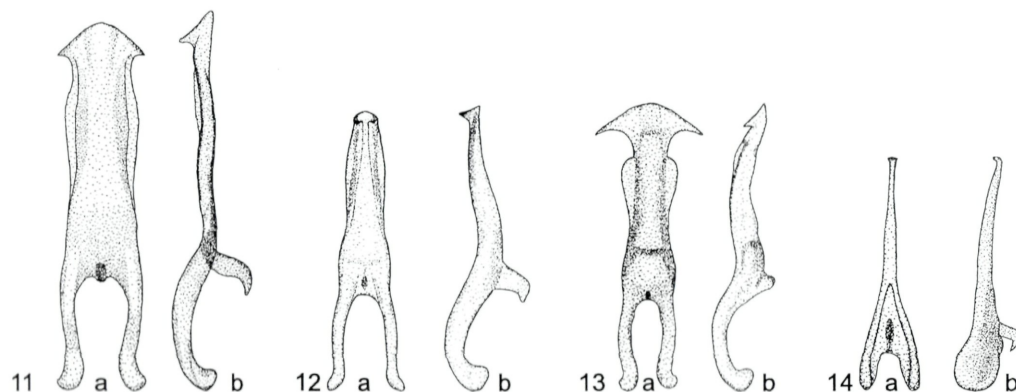
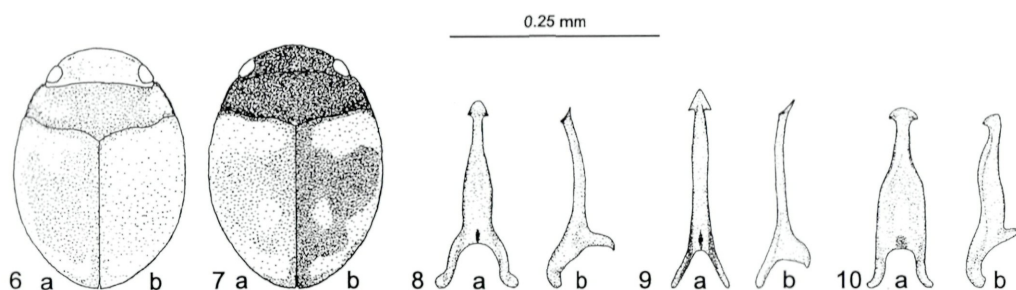
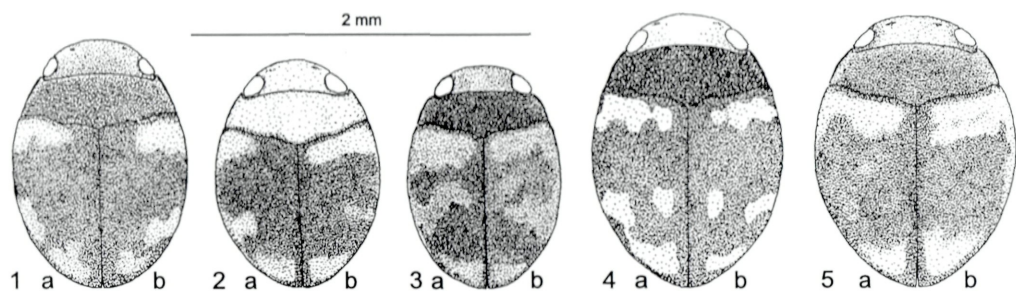
Microdytes bistroemi WEWALKA 1997: 20.

Holotype ♂ (NMW): "China Jiangxi W Jिंगgang Shan Ciping env. 2.-14. VI. 1994".

Additional material studied: Paratypes: 5 ♂♂, 4 ♀♀, with same data as the holotype (NMW, CWW, FMH).

DIAGNOSIS: *M. bistroemi* (Figs. 1, 8, 15) is very similar to *M. uenoi* (Figs. 7, 14, 21) but is distinguishable from the latter by minor differences in the elytral markings and the aedeagus. Its penis resembles that of *M. hainanensis* (Fig. 9) and *M. lotteae* (Fig. 10) but can be separated by the colouration.

DISTRIBUTION: China (Jiangxi).



Figs. 1 - 7: Body outlines and colouration: 1) *M. bistroemi*, (a) holotype, (b) paratype; 2) *M. hainanensis*, (a) holotype, (b) paratype; 3) *M. lotteae*, (a) holotype, (b) paratype; 4) *M. nilssoni*, (a) holotype, (b) paratype; 5) *M. satoi*, (a) paratype, (b) holotype; 6) *M. sinensis*, (a) holotype, (b) paratype; 7) *M. uenoi*, (a) paratype, (b) specimen from Taiwan.

Figs. 8 - 14: penis, (a) dorsal view, (b) lateral view: 8) *M. bistroemi*, holotype; 9) *M. hainanensis*, holotype; 10) *M. lotteae*, holotype; 11) *M. nilssoni*, holotype; 12) *M. satoi*, holotype; 13) *M. sinensis*, holotype; 14) *M. uenoi*, specimen from Taiwan

Microdytes hainanensis WEWALKA

Microdytes hainanensis WEWALKA 1997: 25.

Holotype ♂ (NMW): "CHINA: Hainan (210) Jianfeng Mts., 800m Tian Chi Bot. Gard. 23.1.1996, leg. Jäch" (CWBS loc. 210).

Additional material studied: Paratypes: 15 exs., with same data as the holotype (NMW, CWW, CCS); 2 ♀, CWBS loc. 194 (NMW).

DIAGNOSIS: *M. hainanensis* (Figs. 2, 9, 16) resembles *M. bistroemi* (Figs. 1, 8, 15) and *M. lotteae* (Figs. 3, 10, 17) in the male genitalia but can be distinguished by the colouration of the pronotum being rufo-testaceous and not ferruginous.

DISTRIBUTION: China (Hainan).

Microdytes lotteae sp.n.

Type locality: China, Fujian, Chong'an, Wuyi Gong (CWBS loc. 240).

Holotype ♂ (CASS): "CHINA: FUJIAN, Chong'an Wuyi Shan, 1 km W Wuyi Gong 250m, 15./18.1.1997 leg. Ji & Wang (CWBS 240)". **Paratypes:** 1 ♂, 5 ♀, with same data as the holotype (CASS, CBP, CWW, NMW); 4 ♀, same locality and same date, leg. H. Schönmann (CWW, NMW); 1 ♂, 1 ♀, CWBS loc. 248 (NMW).

DIAGNOSIS: *M. lotteae* (Figs. 3, 10, 17) resembles *M. sinensis* (Figs. 6, 13, 20) in habitus, size and colouration but it differs from this species by finer reticulation of the head, by the sparser and less regular punctures of the pronotum and the elytra as well as the male genitalia.

DESCRIPTION: Habitus: body regularly oval, moderately convex (Fig. 3).

Length of body: 1.3 - 1.5 mm, width: 0.9 - 1.1 mm.

Head: rufo-testaceous; clypeus not bordered; finely and very sparsely punctured, a fine row of punctures alongside the eyes; completely and very finely microreticulate. Antennae flavo-testaceous, rather short and plump (similar to *M. boukali* WEWALKA).

Pronotum: ferruginous to dark brown, somewhat paler laterally; lateral margin finely bordered, regularly rounded; punctures moderately strong and sparse, irregular in size and distribution, coarser punctures along the posterior margin; without microreticulation.

Elytra: rufo-testaceous, ferruginous along the base and the suture, on the disk with a broad more or less distinct ferruginous transverse band (Fig. 3); punctures fine, very sparse and irregular; two longitudinal rows of stronger punctures, particularly the inner one quite distinct; highly polished and shining; without microreticulation.

Ventral side: epipleura and head flavo-testaceous, rest of the ventral side ferruginous to brown; metacoxae, metasternum and abdomen almost without punctures; without microreticulation.

Legs rufo-testaceous.

Male: penis (Fig. 10); parameres (Fig. 17); without secondary sexual characters.

Female: sclerotized spermatheca not found.

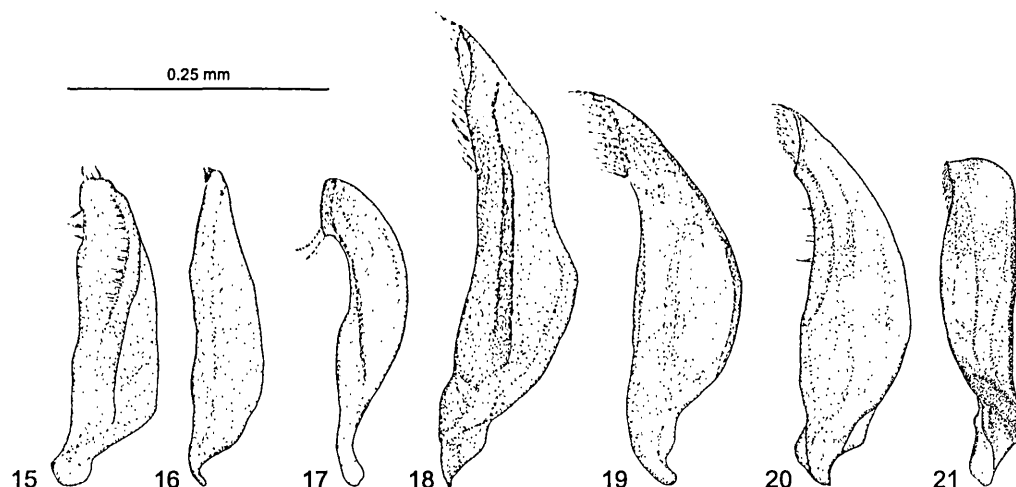
ETYMOLOGY: This species is dedicated to my mother Dr. Lotte Wewalka, Vienna.

DISTRIBUTION: China (Fujian).

Microdytes nilssoni WEWALKA

Microdytes nilssoni WEWALKA 1997: 30.

Holotype ♂ (NMW): "CHINA, NW-Hunan 1993 Wulingyuan, N Dayong Suoxiyu, 31. 10. 450m leg. Schönmann (6)".



Figs. 15 - 21: left paramere, lateral view: 15) *M. bistroemi*, holotype; 16) *M. hainanensis*, holotype; 17) *M. lotteae*, holotype; 18) *M. nilssoni*, holotype; 19) *M. satoi*, holotype; 20) *M. sinensis*, holotype; 21) *M. uenoi*, specimen from Taiwan.

Additional material studied: Paratypes: 4 ♂♂, 2 ♀♀, specimens with same data as the holotype, CWBS loc. 25 (NMW, CWW); 1 ♂, China, Guangxi, Mt. Miao'er Shan above Liangshui, 1700 m, 25.-27.V.1996, leg. M. Satô (CSN); 1 ♂, CWBS loc. 285 (NMW).

DIAGNOSIS: *M. nilssoni* (Figs. 4, 11, 18) is similar to *M. sinensis* (Figs. 6, 13, 20) in the male genitalia but it is distinguishable by the elytral colouration.

DISTRIBUTION: China (Anhui, Hunan, Guangxi).

Microdytes satoi WEWALKA

Microdytes satoi WEWALKA 1997: 33.

Holotype ♂ (NSMT): "Tieshan Ping, 2000m Mt. Miao'er Shan Guangxi, China 22-27.V.1996, M. Satô".

Additional material studied: Paratypes: 2 ♂♂, 5 ♀♀, with same data as the holotype (CSN, CWW).

DIAGNOSIS: *M. satoi* (Figs. 5, 12, 19) resembles *M. nilssoni* (Figs. 4, 11, 18) in size, habitus, colouration of head and pronotum and punctures of dorsal side but differs from it by the coarser punctures on the metasternum, the less distinct elytral markings and the male genitalia.

DISTRIBUTION: China (Guangxi).

Microdytes sinensis WEWALKA

Microdytes sinensis WEWALKA 1997: 38.

Holotype ♂ (NMW): "CHINA Jiangxi W JINGGANG SHAN Ciping env. 2.-4.VI.1994".

Additional material studied: Paratypes: 2 ♂♂, 1 ♀, with same data as the holotype (NMW, CWW); 2 ♂♂, 1 ♀, CWBS loc. 284 (CWW, NMW); 1 ♀, CWBS loc. 22 (NMW).

DIAGNOSIS: *M. sinensis* (Figs. 6, 13, 20) resembles *M. uenoi* (Figs. 7, 14, 21) and *M. bistroemi* (Figs. 1, 8, 15) in habitus and size but it differs from them by the lighter colouration of the head and the male genitalia. The shape of the penis of *M. sinensis* is similar to that of *M. nilssoni*

(Figs. 4, 11, 18) but it is distinguishable by the elytral colouration.

DISTRIBUTION: China (Anhui, Jiangxi).

Microdytes uenoi SATÔ

Microdytes uenoi SATÔ 1972: 49; SATÔ 1981: 68; NAKANE 1988: 31; WEWALKA 1997: 40.

Holotype: "Ryukyu Islands, Iriomote-jima, 10.X.1963, leg. S.I.Uéno" (NSMT).

Additional material studied: Paratype: 1 ♂, with same data as the holotype (CWW); 10 exs., Ryukyu Islands, Iriomote-jima, Nishifunatsuki-gawa, 23.VIII.1994, 24.III.1995, leg. M. Satô (CSN, CWW, CCS); 4 exs., Taiwan, Taipei, Hermei, 6.XII.1991, leg. C.-F. Lee (CWW, CNU, NTUT); 3 exs., Taiwan, Taipei, Gongliao, 12.IX.1992, leg. L.-J. Wang (CWW, NTUT); 8 exs., Taiwan, Ilan, Nan-ao, Jinyang, 13.VIII.1992 and 20.VII.1993, leg. L.-J. Wang (NTUT, CNU, CSN, FMH); 2 exs., CWBS loc. 25 (NMW); 3 exs., CWBS loc. 32 (NMW, CWW); 1 ♂, CWBS loc. 243 (CASS); 21 exs., CWBS loc. 284 (CWW, NMW).

DIAGNOSIS: *M. uenoi* (Figs. 7, 14, 21) is very similar to *M. bistroemi* (Figs. 1, 8, 15) but is distinguishable from the latter by minor differences in the elytral markings and the male genitalia.

DISTRIBUTION: Japan (Ryukyu Islands); China (Anhui, Hunan, Fujian, Taiwan).

Microdytes sp.

Material studied: 4 ♀ ♀, China, Yunnan, 100 km W Kunming, Diaolin, 22.V.-2.VI.1993, leg. E. Jendek & O. Šauša.

This species differs from all species so far recorded from China by the pronotum predominantly rufo-testaceous and by the larger size (body length: 2.10 - 1.85 mm, width: 1.3 mm). The specimens resemble *M. shunichii* SATÔ [Vietnam], *M. akitai* WEWALKA [Laos] and *M. holzmanni* WEWALKA & WANG [Laos] in colouration but they differ in the larger size. They probably belong to a new species.

DISTRIBUTION: China (Yunnan).

Key to the Chinese species species of *Microdytes*

- | | | |
|---|--|--------------------|
| 1 | Pronotum predominantly rufo-testaceous, size: 1.3 - 1.6 mm | <i>hainanensis</i> |
| - | Pronotum predominantly ferruginous to dark brown | 2 |
| 2 | Head rufo-ferruginous to dark brown | 3 |
| - | Head rufo-testaceous | 4 |
| 3 | Elytra predominantly flavo-testaceous often with extensive ferruginous markings leaving open a testaceous post-median spot near suture, size: 1.4 - 1.7 mm | <i>uenoi</i> |
| - | Elytra predominantly dark brown with testaceous markings without a post-median spot near suture, size: 1.5 - 1.6 mm | <i>bistroemi</i> |
| 4 | Elytra predominantly dark brown with testaceous markings | 5 |
| - | Elytra predominantly flavo-testaceous often with indistinct ferruginous markings | 6 |
| 5 | Testaceous markings include a post-median spot near suture, size: 1.6 - 1.8 mm | <i>nilssoni</i> |
| - | Without a post-median spot near suture, size: 1.6 - 1.8 mm | <i>satoi</i> |
| 6 | Head distinctly microreticulate, size: 1.5 - 1.7 mm | <i>sinensis</i> |
| - | Head very finely microreticulate, size: 1.3 - 1.5 mm | <i>lotteae</i> |

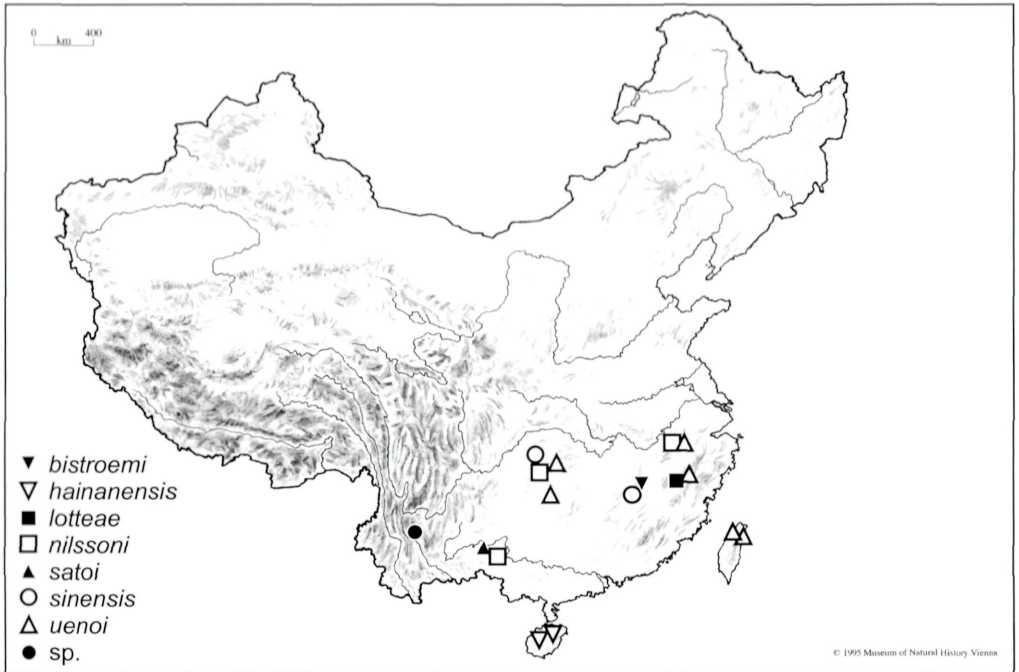


Fig. 22: Geographical distribution of *Microdytes bistroemi*, *M. hainanensis*, *M. lotteae*, *M. nilssoni*, *M. satoi*, *M. sinensis*, *M. sp.*

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