

DYTISCIDAE: III. The *Hyphydrus* ILLIGER species of China (Coleoptera)

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Abstract

The *Hyphydrus* ILLIGER (Coleoptera: Dytiscidae) species thus far recorded from China are listed and keyed. The distribution of the species, based on verified records, is presented. *Hyphydrus fungensis* BISTRÖM & SATÖ is recorded for the first time from China. The genus *Hyphydrus* is recorded for the first time from Tibet.

Key words: Coleoptera, Dytiscidae, *Hyphydrus*, China, key, distribution.

Introduction

The *Hyphydrus* species occurring in China are still fragmentarily known. Articles dealing with the genus are quite few considering the enormous land area of China. The most important works besides SHARP's (1882) enormous monograph of Dytiscidae are those of FALKENSTRÖM (1936), BRINCK (1943) and BALFOUR-BROWNE (1944) who published taxonomic reviews of the Chinese and Japanese *Hyphydrus* species. FENG (1933) provided a taxonomic review of the Chinese Dytiscidae and recognized four *Hyphydrus* species from that country. WU (1937) and NILSSON (1995) published lists of the Dytiscidae recorded from China. Finally, BISTRÖM (1982) provided a global revision of the genus. At present, nine species of *Hyphydrus* are recognized from China.

The aim of the present article is to list the *Hyphydrus* species recorded from China, provide a key for determination at the species-level and present the known distribution of the species, based on records verified by the author of this article.

The genus *Hyphydrus*, belonging to the tribe Hyphyrini in the subfamily Hydroporinae, is distinguished by the following characteristics: base of metatrochanter totally exposed and clypeus with anterior margin beaded.

Acronyms and CWBS localities

BMNH	The Natural History Museum, London, UK
CAS	California Academy of Sciences, San Francisco, USA
CASS	Chinese Academy of Sciences, Institute of Applied Ecology, Shenyang
CWBS	China Water Beetle Survey
CWW	Coll. Wewalka, Wien
IPKE	Institut für Pflanzenschutzforschung Kleinmachnow, Eberswalde, Germany
ISN	Institut royal des Sciences naturelles de Belgique, Brussels, Belgium
LUZ	Zoological Museum, Lund, Sweden

* Contribution to the study of Dytiscidae 71.

MNB	Museum für Naturkunde, Berlin, Germany
MNHN	Muséum national d'Histoire naturelle, Paris, France
MZH	Zoological Museum, Helsinki, Finland
NMW	Naturhistorisches Museum, Vienna, Austria
NMP	Národní Muzeum, Prague, Czech Republic
OLL	Oberösterreichisches Landesmuseum, Linz, Austria
RMS	Naturhistoriska Riksmuseet, Stockholm, Sweden
ZMK	Zoologisk Museum, Copenhagen, Denmark
ZSM	Zoologische Staatssammlung, Munich, Germany

- CWBS loc. 28: **Hunan Province**; Huaihua Prefecture; Huitong County; Guangping Township; near Paotuan Village, ca. 1 km from Academia Sinica Research Station; small river, flowing through rice terraces, partly dammed up, slightly polluted, ca. 1 m wide, ca. 350 m a.s.l.; 2.XI.1993; leg. Schönmann, Schillhammer & Ji.
- CWBS loc. 33: **Hunan Province**; Huaihua Prefecture; Huitong County; Guangping Township; ca. 10 km S of lower Research Station of Academia Sinica; springfed pools along road ditch and flooded rice fields, ca. 400 m a.s.l.; 6.XI.1993; leg. Schönmann, Schillhammer & Ji.
- CWBS loc. 40: **Guangxi Autonomous Region**; Liuzhou Prefecture; ca. 10 km NE Liuzhou City; 3 km NW Shanmenjiang Forest Station; small stream, ca. 1.5 - 2.0 m wide, slowly flowing through dense vegetation of small shrubs and some abandoned rice fields, ca. 150 - 200 m a.s.l.; 11.XI.1993; leg. Schönmann, Schillhammer & Ji.
- CWBS loc. 89: **Jilin Province**; Yanbian Korean Autonomous Prefecture; Antu County; Baihe City, Baohujü District; surroundings of Changbai Mountain Research Station, along the road to Changbai Mountain; unshaded roadside pools, ca. 750 m a.s.l.; 19.VIII.1994; leg. Jäch.
- 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. 109: **Liaoning Province**; Fushun City Region; Qingyuang County; 120 km NE Fushun City; 4 km W Douhutun Town; Shiaoja Gou; ground water pool, 40 m², 1 m deep, margin with stones and mud, unpolluted, more than 20°C, 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. 147: **Liaoning Province**; Anshan City Region; Qian Shan Forest Park; ca. 15 km SE Anshan City, ca. 10 km from park main gate; Xihai Lake, ca. 80 m wide, slightly eutrophic, 350 m a.s.l.; 4.V.1995; leg. Wang.
- CWBS loc. 148: **Liaoning Province**; Shenyang City Region; ca. 7 km NW Xinmin City; close to road No. 102; rain water and ground water pool, ca. 6 m wide, unshaded, 50 m a.s.l.; 2.VI.1995; leg. Wang.
- CWBS loc. 149: **Liaoning Province**; Shenyang City Region; ca. 7 km NW Xinmin City; 20 m from CWBS loc. 148; rain water and ground water pool, ca. 15 m wide, unshaded, 50 m a.s.l.; 2.VI.1995; leg. Wang.
- CWBS loc. 150: **Liaoning Province**; Shenyang City Region; ca. 7 km NW Xinmin City; 20 m from road No. 102; rain water and ground water pool, ca. 30 m wide, unshaded, 50 m a.s.l.; 2.VI.1995; leg. Wang.
- CWBS loc. 190: **Hainan Province**; Qiongzong County; ca. 4 km W Qiongzong City; fish pond, ca. 150 m a.s.l.; 16.I.1996; leg. Jäch, Ji & Wang.

CWBS loc. 217: **Hainan Province**; Wanning County; ca. 6 km W Dongxing Town; roadside rain water ditches and small man-made ground water pool (ca. 10 m²) in rubber plantation, ca. 50 m a.s.l.; 25.I.1996; leg. Jäch, Ji & Wang.

CWBS loc. 275: **Guizhou Province**; Bijie Prefecture; Minxi County; Gong Jia Lake, with aquatic vegetation, surrounded by agricultural fields, slightly polluted, ca. 1200 - 1300 m a.s.l.; 30.VII.1997; leg. Wang.

CWBS loc. 278: **Guizhou Province**; Zunyi Prefecture; Zunyi City Region; 25 km NE Zunyi City, near Niuxin Shan village; river, 5 m wide, fast flowing, banks with gravel and sand, slightly polluted, ca. 1000 m a.s.l.; 3.VIII.1997; leg. Wang.

CWBS loc. 327: **Nei Mongol Autonomous Region**; Zhaowuda Meng Prefecture; Wengniute Qi County; ca. 120 km NNE Chifeng, surrounding of Wulanaodu Research Station; springfed pool with steep margins, surrounded by dense vegetation (reed, bushes and trees), ca. 480 m a.s.l.; 22.VII.1998; leg. Ji, Schönmann, Schönmann & Wang.

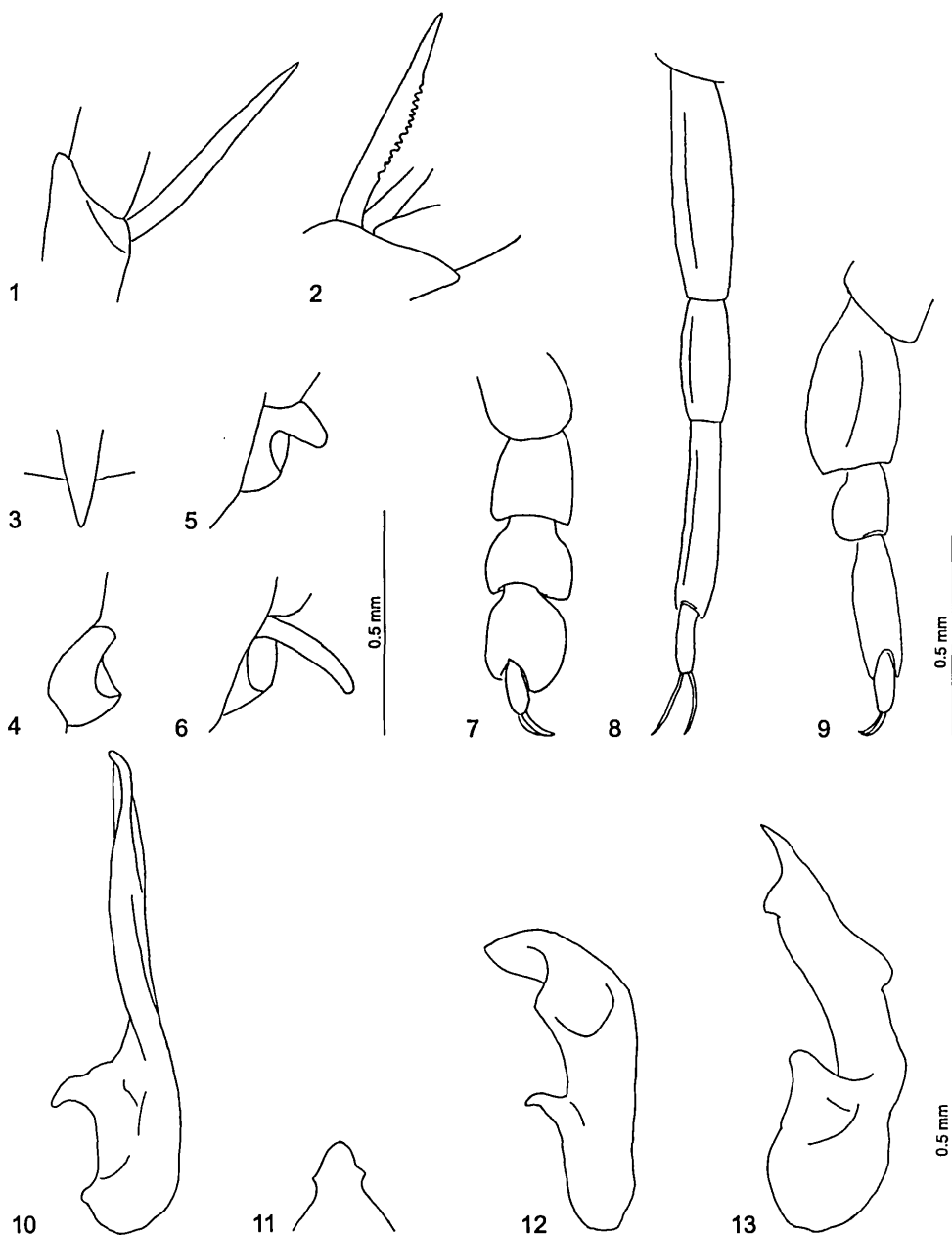
CWBS loc. 328: **Nei Mongol Autonomous Region**; Zhaowuda Meng Prefecture; Wengniute Qi County; ca. 120 km NNE Chifeng, surrounding of Wulanaodu Research Station; flat rain water pools between dunes, shores with submerged vegetation, ca. 480 m a.s.l.; 22.VII.1998; leg. Ji, Schönmann, Schönmann & Wang (see JÄCH & JI 1998: Figs. 22, 23).

Key to the Chinese species of *Hyphydrus* (predominantly only applicable to male specimens)

- | | | |
|---|---|---------------------------|
| 1 | Longer metatibial spine smooth-edged (Fig. 1) | 2 |
| - | Longer metatibial spine serrate (Fig. 2) | 6 |
| 2 | Second sternite of male with sharp, backwards projecting process (Fig. 3); disc of elytron in female with distinct, longitudinal groove | <i>H. l. lyratus</i> |
| - | Second sternite lacks process; disc of elytron non-grooved | 3 |
| 3 | Male pro- and mesotarsi incised but lack distinct process (Fig. 4) | 4 |
| - | Male pro- and mesotarsi incised and provided with process (Figs. 5, 6) | 5 |
| 4 | Male pro- and mesotarsi broad, flattened (Fig. 7) | <i>H. excoffieri</i> |
| - | Male pro- and mesotarsi slender, non-flattened | <i>H. pulchellus</i> |
| 5 | Male pro- and mesotarsi with broad process (Fig. 5) | <i>H. fangensis</i> |
| - | Male pro- and mesotarsi with slender process (Fig. 6) | <i>H. sumatrae</i> |
| 6 | Male mesotarsus long, slender (Fig. 8) | <i>H. falckenstroemi</i> |
| - | Male mesotarsus shorter, basal segment enlarged (Fig. 9) | 7 |
| 7 | Penis in lateral view apically almost straight, narrow (Fig. 10); apex of penis as in Fig. 11 | <i>H. japonicus vagus</i> |
| - | Penis in lateral view curved and broad (Figs. 12 - 13) | 8 |
| 8 | Penis short (Fig. 12) | <i>H. detectus</i> |
| - | Penis longer (Fig. 13) | <i>H. orientalis</i> |

Faunistic remarks

Figures 14 and 15 are based on verified records given below. All the information of material sampled by the CWBS is listed. For more detailed information of other records, see BISTRÖM (1982).



Figs. 1 - 13: 1) longer metatibial spine, *Hyphydrus excoffieri*; 2) longer metatibial spine, *H. japonicus vagus*; 3) male sternal process, *H. l. lyratus*; 4) male protrochanter, *H. excoffieri*; 5) male protrochanter, *H. fangensis*; 6) male protrochanter, *H. sumatrae*; 7) male protarsus, *H. excoffieri*; 8) male mesotarsus, *H. falckenstroemi*; 9) male mesotarsus, *H. japonicus vagus*; 10) penis, lateral aspect, *H. japonicus vagus*; 11) apex of penis, dorsal aspect, *H. japonicus vagus*; 12) penis, lateral aspect, *H. detectus*; 13) penis, lateral aspect, *H. orientalis*.

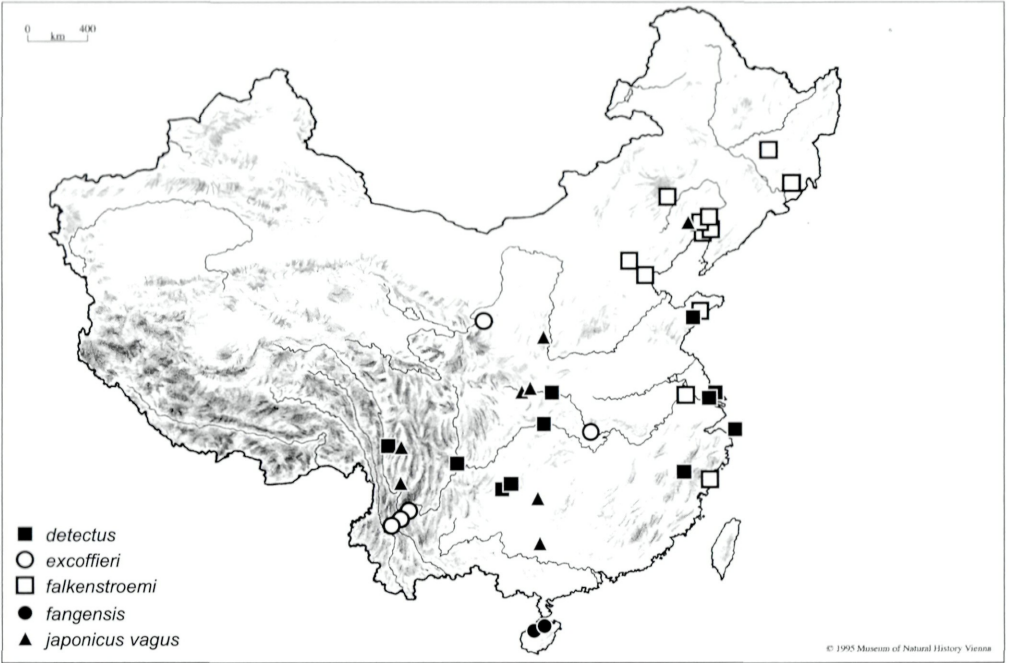


Fig. 14: Confirmed Chinese distribution records of *Hyphydrus detectus*, *H. excoffieri*, *H. falkenstroemi*, *H. fangensis*, *H. japonicus vagus*.

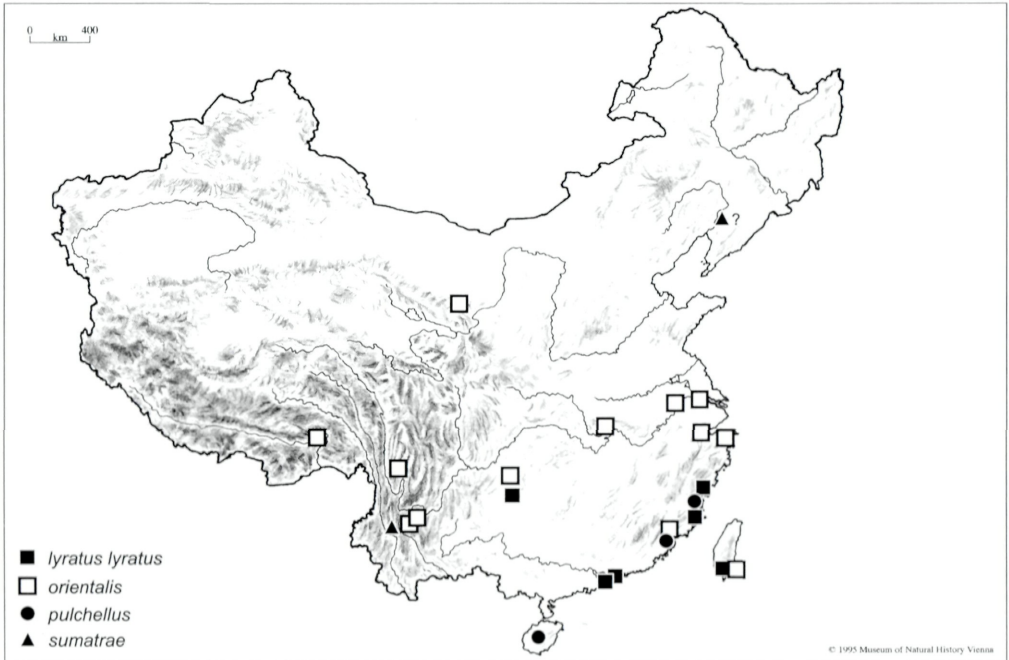


Fig. 15: Confirmed Chinese distribution records of *Hyphydrus lyratus*, *H. orientalis*, *H. pulchellus*, *H. sumatrae*.

***Hyphydrus birmanicus* RÉGIMBART, 1888**

This species was recorded from China (Yunnan) by ZENG (1989) - see also NILSSON (1995). This record needs verification.

***Hyphydrus detectus* FALKENSTRÖM, 1936**

SHANDONG: "Kiautschau" [= Jiaozhou] (1 ex. ZSM). - JIANGSU: "Kiangsu" [= Jiangsu] (1 ex. RMS); "Soochow" [= Suzhou] (3 exs. ZSM). - SICHUAN: "NO Szechuan, Wassuland, Chungghwa" [= NE Sichuan, Yingxiuwan] (6 exs. LUZ, 4 exs. RMS); "Central China, Ginyun, Tempelberg" [= Ginyun Mountain, Beipei, Chongqing City Region] (1 ex. NMP). - GUIZHOU: CWBS loc. 275 (3 exs. NMW, 1 ex. MZH); CWBS loc. 278 (1 ex. NMW). - ZHEJIANG: Chushan [= Zhoushan] Island (1 ex. BMNH). - FUJIAN: "Foochow" [= Fuzhou] (2 exs. BMNH); "Fukien" [= Fujian], Shaowu, leg. Klapperich (1 ex. CWW).

The record "Manchuria, Weishaha", leg. Weymarn (1 ex. CAS) is not located.

***Hyphydrus excofferi* RÉGIMBART, 1899**

GANSU: "Hoci-Sien" [= Hui Xian] (1 ex. MNB). - HUBEI: "Hupe" [= Hubci], "Johang" [= Yichang, ca. 250 km W Wuhan City] (2 exs. MNB). - YÜNNAN: S Xiaoguan, 12 km S Weishan, Weibaoshan 2500 - 3000 m, I.-17.VII.1993 (1 ex. NMW); 100 km W Kunming, Diaolin, 22.V.-2.VI.1993 (1 ex. NMW); "Yunnan-Sen" [= Yunnan Province] (7 exs. MNHN); "Yunnan fou" [= Kunming] (1 ex. MNHN, 1 ex. MZH); "Pe-Yen-Tsin" [= Yanfeng] (2 exs. MNHN).

***Hyphydrus falkenstroemi* GSCHWENDTNER, 1939**

NEI MONGOL: CWBS loc. 327 (3 exs. NMW, 1 ex. MZH); CWBS loc. 328 (5 exs. NMW, 1 ex. MZH). - HEILONGJIANG: Harbin (7 exs. MNB, 2 exs. MZH). - JILIN: CWBS loc. 89 (3 exs. NMW). - LIAONING: "Mukden" [= Shenyang] (1 ex. CAS); CWBS loc. 147 (2 exs. NMW); CWBS loc. 148 (9 exs. NMW, 2 exs. MZH); CWBS loc. 149 (3 exs. NMW, 1 ex. MZH); CWBS loc. 150 (8 exs. NHM, 3 exs. MZH); CWBS loc. 103 (1 ex. NMW). - BEIJING: "Peking" [= Beijing] (1 ex. ISN, 2 exs. OLL). - TIANJIN: "Tien-tsin" [= Tianjin] (1 ex. MNHN). - SHANDONG: "Tsingtau" [= Qingdao] (2 exs. IPKE); CWBS loc. 130 (1 ex. NMW). - JIANGSU: "Nanking" [= Nanjing] (8 exs. ISN, 2 exs. CAS, 1 ex. MNHN, 1 ex. MZH). - FUJIAN: "Amoy" [= Xiamen] (1 ex. OLL).

***Hyphydrus fangensis* BISTRÖM & SATÔ, 1988**

HAINAN: CWBS loc. 190 (1 ex. NMW); CWBS loc. 217 (1 ex. NMW, 1 ex. MZH).

First record for China. Previously, *H. fangensis* was known only from Thailand.

***Hyphydrus japonicus vagus* BRINCK, 1943**

LIAONING: CWBS loc. 109 (13 exs. NMW, 3 exs. MZH). - SHAANXI: "S Schensi" [= S Shaanxi] (1 ex. MZH, 2 exs. CWW). - SICHUAN: "Szechuan, Wassuland, Chungghwa" [= Sichuan, Yingxiuwan] (25 exs. LUZ, 3 exs. RMS); "NO Szechuan" [= NE Sichuan] (2 exs. RMS). - HUNAN: CWBS loc. 28 (8 exs. NMW, 4 exs. MZH); CWBS loc. 33 (5 exs. NMW, 1 ex. MZH). - GUANGXI: CWBS loc. 40 (3 exs. NMW). - YÜNNAN: Ninglang, 27.19N/100.55E (1 ex. NMW).

Records of *H. japonicus* from Taiwan (ZIMMERMANN 1919, KAMIYA 1938) need to be verified.

***Hyphydrus lyratus lyratus* SWARTZ, 1808**

GUIZHOU: "Kouy Tcheou" [= Guizhou] (7 exs. MNHN, 1 ex. MZH). - FUJIAN: "Foochow" [Fuzhou] (1 ex. BMNH). - HONG KONG: "Hong Kong, Galatea" [these specimens probably originate from a Danish marine expedition which passed through Asia in the early 1950's; Galatea was the name of the vessel] (8 exs. ZMK). MACAO: Friendship Monument, at light, 2.V.1998, leg. Easton [det. Wewalka] (1 ex. NMW); pond on reclaimed area, 27.IX.1995, leg.

Novo & Easton [det. Wewalka] (1 ex. NMW) (see also JÄCH & EASTON 1998). - TAIWAN: "S Formosa" [= S Taiwan] "Allping" [= ? Anping] (3 exs. MNB, 1 ex. MZH).

Hyphydrus orientalis CLARK, 1863

GANSU: "Hoei-Sien" [= Hui Xian] (12 exs. MNB). - JIANGSU: "Nanking" [= Nanjing] (14 exs. CAS, 3 exs. MZH); "Wusi" [= Wuxi] (2 exs. MZH); "Chinkiang" [= Zhenjiang Sheng] (1 ex. CWW). - ZHEJIANG: Hangchow [= Hangzhou] (1 ex. CAS); Chusan [= Zhoushan Island] (22 exs. BMNH, 4 exs. MZH). - HUBEI: Hupe [= Hubei], "Johang" [= Yichang, ca. 250 km W Wuhan City] (5 exs. MNB). - JIANGXI: "Kiang-Si" [= Jiangxi] (6 exs. MNHN). - SICHUAN: "Szechuen" [= Sichuan], "Kuanshien", VIII.1934, leg. D.C. Graham (1 ex. CWW). - TIBET: "Kieng Tchang [= Qingzhang Plateau, Bassin du Ya-lang [= Lang Xian, ca. 250 km E Lhasa]" (13 exs. MNHN, 2 exs. MZH). - GUIZHOU: "Kuoy Tcheou" [= Guizhou] (28 exs. MNHN, 2 exs. MZH). - YÜNNAN: "Yunnan Centr. E of Tchín-Kiang" [= Chengjiang, ca. 75 km SE Kunming City, Chengjiang County, Yüxi Prefecture] (1 ex. MNHN); "Yunnan sen" [= Yunnan Province] (11 exs. MNB, 2 exs. MNHN, 1 ex. MZH). - FUJIAN: "Amoy" [= Xiamen] (4 exs. BMNH, 1 ex. OLL); "Fukien" [= Fujian], Shaowu, leg. Klapperich (1 ex. CWW). - TAIWAN: Taipei (2 exs. CAS); Taitung, Lanyu [Orchid Island], 19.VIII.1989, leg. M.-L. Jeng (1 ex. NMW).

Hyphydrus pulchellus CLARK, 1863

FUJIAN: "Amoy" [= Xiamen] (2 exs. ZMK); "Foochow" [= Fuzhou] (1 ex. BMNH). - HAINAN: CWBS loc. 190 (1 ex. NMW).

Hyphydrus sumatrae RÉGIMBART, 1880

YÜNNAN: S Xiaoguan, 12 km S Weishan, Weibaoshan, 2500 - 3000 m, 1.-17.VII.1993 (7 exs. NMW, 3 exs. MZH); 100 km W Kunming, Diaolin, 22.V.-2.VI.1993 (2 exs. NMW).

The taxonomic status of *H. sumatrae* is uncertain; possibly it needs to be further divided. The record from "Mukden" [= Shenyang, Liaoning] (1 ex. MNHN) is to be considered questionable (mislabelling?).

Acknowledgements

Sincere thanks are due to Dr. Manfred A. Jäch (Vienna) for sending material for this study. I am obliged to Prof. Dr. Günther Wewalka (Vienna) for additional information. Roberta Brett (San Francisco) is thanked for the control of label data.

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Zeitschrift/Journal: [Water Beetles of China](#)

Jahr/Year: 1998

Band/Volume: [2](#)

Autor(en)/Author(s): Biström Olof

Artikel/Article: [Dytiscidae: III. The Hyphydrus Illiger species of China \(Coleoptera\) 93-100](#)