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Revision of the Chinese species of *Hydraena* KUGELANN

I. Descriptions of 15 new species of *Hydraena* s.str. from southeast China

(Coleoptera: Hydraenidae)

M.A. JÄCH & J.A. DÍAZ

Abstract

Fifteen new species of *Hydraena* s.str. are described: *Hydraena* (s.str.) *aliciae*, *H.* (s.str.) *christoferi*, *H.* (s.str.) *draconisaurati*, *H.* (s.str.) *guangxiensis*, *H.* (s.str.) *guilin*, *H.* (s.str.) *hansreuteri*, *H.* (s.str.) *huangshanensis*, *H.* (s.str.) *huitongensis*, *H.* (s.str.) *jilanzhui*, *H.* (s.str.) *lehmanni*, *H.* (s.str.) *martinschoepfi*, *H.* (s.str.) *philippi*, *H.* (s.str.) *stefani*, *H.* (s.str.) *undevigintioctogintasisyphos*, *H.* (s.str.) *wangmiaoi*. The family Hydraenidae is recorded for the first time from Anhui and Hongkong.

Key words: Coleoptera, Hydraenidae, *Hydraena* s.str., new species, China.

Introduction

Only two species of *Hydraena* s.str. KUGELANN (*H. armipalpis* JÄCH & DÍAZ, 2000, *H. riparia* KUGELANN, 1794) have been recorded from Mainland China so far (see JÄCH 2004). However, during the China Water Beetle Survey this subgenus was in fact found to be very diverse.

In the present paper 15 new species of *Hydraena* s.str. collected between 1992 and 2003 from southeast China (Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hongkong, Hunan, Jiangxi) are described. Numerous additional new species of this subgenus, mainly from other parts of China, will be described in forthcoming papers.

Material, acronyms and descriptions of CWBS localities

CASS Chinese Academy of Sciences, Institute of Applied Ecology, Shenyang

CWBS China Water Beetle Survey

(see <http://www.nhm-wien.ac.at/nhm/2Zoo/coleoptera/publications/chinaindex.html> or <http://www.wasserkaefer.de/projects.htm#Wasserkäfer%20von%20China>)

NMW Naturhistorisches Museum Wien

CWBS loc. 4: **Hong Kong**; New Territories; a) stream, ca. 2 m wide, with pebbles and cobbles, only partly shaded by riparian shrubs, small trees and bamboo, near Wu Kau Tang Village, ca. 125 m a.s.l., b) lower course of same stream, ca. 10–15 m wide, with large volcanic boulders, partly shaded by secondary forest, between Bride's Pool and Plover Cove Reservoir, ca. 50 m a.s.l.; 25.VI.1992; leg. M.A. Jäch; (see JÄCH & JI 1995: Figs. 5, 6).

CWBS loc. 8: **Hong Kong**; New Territories; Tai Po Kau Forest Nature Reserve near Tai Po New Town; stream, ca. 3 m wide, through secondary forest, ca. 150–200 m a.s.l.; 27.VI.1992; leg. M.A. Jäch; (see JÄCH & JI 1995: Fig. 7).

- CWBS loc. 20: **Hunan Province**; Xiangxi Prefecture; Dayong County; Zhangjiajie Forest National Park, Suoxiyü Nature Reserve, Wulingyüan section (ca. 30 km N Dayong City); Pipa Xi (= 'Chinese Lute' River), ca. 2–3 m wide, shaded, very shallow, sometimes even vanishing beneath the gravel of sandstone and occasional limestone, ca. 650 m a.s.l.; 29.X.1993; leg. H. Schönmann, H. Schillhammer & L. Ji; (see JÄCH & JI 1995: Fig. 13).
- CWBS loc. 21: **Hunan Province**; Xiangxi Prefecture; Dayong County; Zhangjiajie Forest National Park, Suoxiyü Nature Reserve, Wulingyüan section (ca. 30 km N Dayong City); small, right side tributary of Pipa Xi, short steep stretch with small waterfalls and big boulders, accumulations of decaying plant material, rocks partly covered with moss, shaded, ca. 650 m a.s.l.; 29.X.1993; leg. H. Schönmann, H. Schillhammer & L. Ji.
- CWBS loc. 30: **Hunan Province**; Huaihua Prefecture; Huitong County; Guangping Township; Moshao Village, ca. 15 km W Guangping Township; ca. 5 km N of upper Research Station of Academia Sinica; small stream, flowing through planted forest (Chinese fir, *Cunninghamia lanceolata*) and rice fields, slightly polluted, ca. 350 m a.s.l.; 4.XI.1993; leg. H. Schönmann, H. Schillhammer & L. 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. H. Schönmann, H. Schillhammer & L. Ji.
- CWBS loc. 35: **Hunan Province**; Huaihua Prefecture; Huitong County; Guangping Township; 2 km upstream of CWBS loc. 30, near Moshao Village; small stream, 0.5–1 m wide, partly canalized, partly vanishing beneath the gravel, ca. 400 m a.s.l.; 7.XI.1993; leg. H. Schönmann, H. Schillhammer & L. Ji.
- CWBS loc. 41: **Guangxi Autonomous Region**; Guilin Prefecture; Lipu County; ca. 120 km S Guilin, ca. 80 km E Liuzhou City; Siuren Village; fast flowing stream, ca. 1 m wide, unpolluted, partly shaded, gravel and rocks, volcanic, numerous little waterfalls, ca. 350 m a.s.l.; 12.XI.1993; leg. H. Schönmann, H. Schillhammer & L. Ji.
- CWBS loc. 43: **Guangxi Autonomous Region**; Yülin Prefecture; Liuwan Da Shan; small, steep mountain streams on the S slope of Kui Shan Ding (= Helmet Mountain), cataracts, large crystalline boulders, coarse sand, dense vegetation, slopes covered with planted forest, 600–700 m a.s.l.; 17.XI.1993; leg. H. Schönmann, H. Schillhammer & L. Ji.
- CWBS loc. 172: **Hong Kong**; NW New Territories; Plover Cove Country Park, near abandoned village (Ha Mui Tin), ca. 1.5 km E Wu Kau Tang; Sam A Chung stream, ca. 1–2 m wide, partly shaded by secondary forest, ca. 60 m a.s.l.; 14.I.1996; leg. M.A. Jäch.
- CWBS loc. 177: **Hong Kong**; NW New Territories; Luk Keng area, Kai Kuk Shue Ha Village; small stream, ca. 1–2 m wide, with fine gravel, more or less unshaded, flowing through village into fish ponds, slightly above sea level; 14.I.1996; leg. M.A. Jäch.
- CWBS loc. 246: **Fujian Province**; Jianyuan Prefecture; Chong'an City Region; ca. 3 km NW Wuyi Gong Village (= Shanqian), ca. 10 km S Chong'an City; upper part of small river, mostly dried out, partly 20–30 cm wide sections of flowing water in narrow gorges, crystalline sand and gravel, partly larger pools, shaded by dense vegetation, gravel mostly covered by algae, 300 m a.s.l.; 17.I.1997; leg. H. Schönmann, L. Ji & M. Wang.
- CWBS loc. 250: **Fujian Province**; Jianyuan Prefecture; Chong'an City Region; 3 km W Da'an Town, ca. 20 km NW Chong'an City; small stream in steep valley, < 0.5 m wide, rock pools and waterfalls, sections with coarse crystalline gravel, densely shaded by forest, water very cold, 500 m a.s.l.; 19.I.1997; leg. H. Schönmann, L. Ji & M. Wang.

- CWBS loc. 251: **Fujian Province**; Jianyuan Prefecture; Chong'an City Region; ca. 20 km NW Chong'an City, 5 km S Da'an, 2 km NE Lian Dun Village; small river, 0.5–1.0 m wide, in steep, densely forested valley (broadleaf trees and bamboo), rock pools and waterfalls, sections with fine and coarse crystalline gravel, densely shaded, water very cold, 500 m a.s.l.; 20.I.1997; leg. H. Schönmann, L. Ji & M. Wang (see JÄCH & Ji 1998: Fig. 15).
- CWBS loc. 252: **Fujian Province**; Jianyuan Prefecture; Guangze County (= Shuanxi); 12 km S Zhima Town and 2 km N Li Fang Village; small stream flowing from forested mountains (broadleaf trees, bamboo and *Cunninghamia*), ca. 1 m wide, partly shaded by bushes, pools (filled with sand) and sections with granitic rocks and coarse crystalline gravel, 400 m a.s.l.; 22.I.1997; leg. H. Schönmann, L. Ji & M. Wang.
- CWBS loc. 260: **Fujian Province**; Longyan City Region; near Ke Shan Monastery, near Jiangshan (= Tongbo), on the slope of Meihua Shan (summit: ca. 1700 m a.s.l.), 20 km N Longyan City; small stream, ca. 0.5 m wide, partly flowing over granitic rock (incl. small pools), partly running over coarse gravel, turbid, partly shaded by bushes, surrounded by rice fields, 900–1000 m a.s.l.; 28.I.1997; leg. H. Schönmann, L. Ji & M. Wang.
- CWBS loc. 262: **Fujian Province**; Longyan City Region; ca. 30 km W Longyan City, 2 km S Dachi Village; stream, ca. 1–2 m wide, descending from Ceyan Shan (summit: ca. 1500 m a.s.l.), rocky steps with waterfalls, pools with crystalline sand, coarse granitic gravel, in the upper section surrounded by broadleaf forest, in the lower section by rice fields, 750 m a.s.l.; 29.I.1997; leg. H. Schönmann, L. Ji & M. Wang.
- CWBS loc. 263: **Fujian Province**; Longyan City Region; 2 km N Xiaochi Village, ca. 20 km W Longyan City; mountain stream, 3–5 m wide, flowing through densely forested (broadleaf trees) steep valley descending from Meihua Shan, small waterfalls, big pools, crystalline sand and gravel, shaded, pools with decaying organic matter, 650 m a.s.l.; 30.I.1997; leg. H. Schönmann, L. Ji & M. Wang (see JÄCH & Ji 1998: Figs. 14, 16).
- CWBS loc. 264: **Fujian Province**; Longyan City Region; 2 km E Shizhong Town, ca. 40 km S Longyan City; small stream, < 0.5 m wide, descending from Shangfang Shan (summit: ca. 1400 m a.s.l., partly forested), only little water running in deep gorge, waterfalls and small pools, surrounded by rice fields and *Cunninghamia* forest, 850 m a.s.l.; 31.I.1997; leg. H. Schönmann, L. Ji & M. 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. H. Schönmann & M. Wang.
- CWBS loc. 287: **Anhui Province**; Weizhou Prefecture; Huang Shan NP; 40 km NW Huang Shan City (= Tunxi), on the road from Huang Shan City to Tang Kou Town; 2 small streams, < 0.5 m wide, surrounded by tea and vegetable gardens, shaded by bushes and bamboo, pools with leaves, small waterfalls, short sections with water running over crystalline sand and gravel, 350–400 m a.s.l.; 26.X.1997; leg. H. Schönmann & M. Wang.
- CWBS loc. 291: **Anhui Province**; Weizhou Prefecture; Huang Shan NP; 30 km NW Huang Shan City (= Tunxi), 3 km W Nantang; stream, ca. 0.5–1.0 m wide, waterfalls and pools, rocky and gravelly sections, partly shaded by bushes and bamboo, surrounded by vegetable gardens, 350–550 m a.s.l.; 30.X.1997; leg. H. Schönmann & M. Wang.
- CWBS loc. 293: **Anhui Province**; Weizhou Prefecture; Huang Shan NP; 45 km NW Huang Shan City (= Tunxi), 4 km NE of Huang Shan City – Tang Kou Town road; small stream, < 0.5 m wide, in a narrow steep valley, mainly shaded by bushes, surrounded by vegetable and tea gardens and single yew trees, 550 m a.s.l.; 1.XI.1997; leg. H. Schönmann & M. Wang.

- CWBS loc. 294: **Anhui Province**; Weizhou Prefecture; Huang Shan NP; 45 km NW Huang Shan City (= Tunxi), 4 km NE of Huang Shan City – Tang Kou road; stream, ca. 3–5 m wide, along a narrow road in a valley with steep forested slopes, and few rice fields, running over crystalline rock and coarse gravel, unshaded, 400 m a.s.l.; 1.XI.1997; leg. H. Schönmann & M. Wang (see JÄCH & JI 1998: Fig. 18).
- CWBS loc. 302: **Jiangxi Province**; Yicun Prefecture; Jiuling Shan; Fengxin County; 18 km NW Shangfu City, near Jiu Xian Village, on Wumei Shan (summit: ca. 1740 m a.s.l.); streams, 0.5–1 m wide, deep ditches, crystalline sand, little gravel, shaded by bushes and surrounded by rice fields, 700–800 m a.s.l.; 12.XI.1997; leg. H. Schönmann & M. Wang.
- CWBS loc. 305: **Jiangxi Province**; Yicun Prefecture; Jiuling Shan; Fengxin County; 35 km W Shangfu City, near Dong Xi Ling Village; stream, ca. 0.5–1 m wide, in a deep ravine between rice fields, 800 m a.s.l.; 14.XI.1997; leg. H. Schönmann & M. Wang.
- CWBS loc. 306: **Jiangxi Province**; Yicun Prefecture; Jiuling Shan; Fengxin County; 18 km NW Shangfu City, near Jiu Xian Village, on slope of Wumei Shan (summit 1740 m a.s.l.); two very steep mountain streams, 2–3 m wide, surrounded by dense forest (bamboo, *Cunninghamia* and various broadleaf trees), high waterfalls, deep and sandy pools, granitic boulders, 800 m a.s.l.; 15.XI.1997; leg. H. Schönmann & M. Wang (see JÄCH & JI 1998: Fig. 21).
- CWBS loc. 442: **Guizhou Province**, Tongren Prefecture, Jiangkou County, ca. 39 km SW Jiangkou, ca. 3.5 km W of Guanhe Village, ca. 600 m a.s.l., 27°32'42"N 108°38'38"E; small stream (left tributary of River Guanhe), ca. 1–2 m wide, unshaded, gravel (up to ca. 0.2 m in diameter); geology: limestone, sandstone; 29.VI.2001; leg. H. Schillhammer & M. Wang.
- CWBS loc. 464: **Guangdong Province**, Shaoguan Prefecture, Yangshan County, mountain pass (summit: ca. 700 m), Huaiji – Yangshan road, ca. 530 m a.s.l.; torrent, ca. 2–3 m wide, with large boulders, on steep slope, through degraded primary forest; 3.XI.2001; leg. M.A. Jäch, A. Komarek & M. Wang.
- CWBS loc. 477: **Guangdong Province**, Shaoguan Prefecture, Shixing County, Chebaling Nature Reserve, ca. 60 km SE of Shixing, ca. 2 km E of Chebaling Village, ca. 450 m a.s.l., 24°41'47"N 114°11'57"E; stream (right tributary of River Shui), 1–2 m wide, through dense primary forest; 7.XI.2001; leg. M.A. Jäch & A. Komarek.
- CWBS loc. 495: **Guangdong Province**, Guangzhou City Region, Longmen County, ca. 45 km N of Zengcheng, ca. 4 km N of Nankunshan Town, Nankun Shan, ca. 500 m a.s.l., 23°37'28"N 113°50'10"E; small stream, ca. 1 m wide, through bamboo forest; 13.XI.2001; leg. M. Wang.
- CWBS loc. 503: **Hunan Province**, Yueyang City, Pingjiang County, NE Nanjiangqiao, Mufu Shan, between Fengpi and Yuantao [villages], ca. 600 m a.s.l., 113°48'03"E 28°57'17"N; mountain stream, ca. 1–2 m wide, siliceous sand, boulders, little flood debris, dense riparian vegetation, bamboo, *Cunninghamia*, *Pinus masoniana*; 21.III.2003; leg. H. Schönmann, A. Komarek & M. Wang.
- CWBS loc. 504: **Hunan Province**, Yueyang City, Pingjiang County, NE Nanjiangqiao [village], Mufu Shan, between Fengpi and Yuantao [villages], ca. 600 m a.s.l., 113°48'03"E 28°57'17"N; large mountain stream, ca. 2–3 m wide, siliceous sand, rice terraces; 21.III.2003; leg. H. Schönmann, A. Komarek & M. Wang.
- CWBS loc. 513: **Jiangxi Province**, Yichun City, Jing'an County, ca. 50 km NE Jing'an town, ca. 350 m a.s.l., 115°10'13"E 28°57'51"N; steep forest stream, ca. 1–2 m wide, gravel, flood debris, surrounded by *Cunninghamia* forest; 27.III.2003; leg. H. Schönmann, A. Komarek & M. Wang.
- CWBS loc. 514: **Jiangxi Province**, Yichun City, Jing'an County, ca. 70 km NW Jing'an Town, ca. 550 m a.s.l., 115°11'17"E 29°03'17"N; shallow, sandy stream, flowing through bamboo forest, ca. 0.5 m wide, flood debris; 27.III.2003; leg. H. Schönmann, A. Komarek & M. Wang.

CWBS loc. 517: **Jiangxi Province**, Yichun City, Tonggu County, ca. 5 km N Daduan Town, Hemiaodong [mountain], near Miaoxia [village], ca. 450 m a.s.l., 114°34'53"E 28°36'30"N; left tributary to CWBS loc. 516, ca. 1 m wide, forest stream, siliceous gravel, moss, flood debris, bamboo and *Cunninghamia* forest, abandoned rice terraces; 29.III.2003; leg. H. Schönmann, A. Komarek & M. Wang.

CWBS loc. 518: **Hunan Province**, Liuyang City County, Tonggu County, Dawei Shan (outside NP), ca. 1360 m a.s.l., 114°11'10"E 28°25'44"N; steep forest stream, ca. 1–1.5 m wide, granite sand, cold, shaded; 30.III.2003; leg. H. Schönmann, A. Komarek & M. Wang.

CWBS loc. 521: **Hunan Province**, Liuyang City County, Tonggu County, ca. 5 km W Dahu [town], near Xiyuan [village], ca. 400 m a.s.l., 113°53'25"E 28°26'21"N; stream, ca. 0.5 m wide, siliceous sand, flood debris, rice fields, *Cunninghamia* forest; 31.III.2003; leg. H. Schönmann, A. Komarek & M. Wang.

Hydraena (s.str.) *hansreuteri* sp.n.

TYPE LOCALITY (CWBS loc. 264): Small stream, less than 50 cm wide, only little water running in deep gorge (descending from Shangfang Shan, ca. 1400 m, partly forested), waterfalls and small pools, surrounded by rice fields and *Cunninghamia* forest, 850 m a.s.l.; 2 km E Shizhong Town, ca. 40 km S Longyan City; Longyan City Region; southern Fujian Province.

TYPE MATERIAL: **Holotype** ♂ (CASS): "CHINA: FUJIAN, Longyan Shizhong, Shangfang Shan 850m, 31.1.1997 leg. H.Schönmann (CWBS 264)". **Paratypes** (CASS, NMW): 25 exs. (8 ♂♂, 17 ♀♀), same label data as holotype; 1 ♂: "CHINA: Guangdong Prov. Huaiji - Yangshan rd. 3.11.2001, ca. 530 m leg. Jäch, Komarek & Wang (CWBS 464)"; 2 exs. (1 ♂, 1 ♀): "CHINA: Guangdong Prov. Chebaling N.R. 24°41'47"N 114°11'57"E 7.11.2001, ca. 450 m Jäch & Komarek (CWBS 477)"; 9 exs. (2 ♂♂, 7 ♀♀): "CHINA: Guangdong Prov. 45 km N Zengcheng 23°37'28"N 113°50'10"E 13.11.2001, ca. 500 m leg. M. Wang (CWBS 495)".

DIAGNOSIS: Habitus as in Fig. 1; 2.3–2.6 mm long. Reddish brown to dark blackish brown, frons usually considerably darker (blackish brown) than anterior part of head. In general appearance (colouration, body shape, punctuation), this species agrees very well with *Hydraena armipalpis*. It can be distinguished from the latter mainly by its larger size and by the sexual characters, from *H. masatakai* JÄCH & DÍAZ¹ it can be distinguished also by the elytral punctuation.

Aedeagus (Fig. 16a–c): Very intricately shaped; main piece with four subapical setae, one on dorsal face of lateral projection, and three (one dorsal, two ventral) near weakly defined border between main piece and distal lobe. It differs from the aedeagus of *H. armipalpis* in being more straight (lateral view), apically less strongly dilated (ventral/dorsal view), in the shape and setation of the distal lobe, and in the shape and setal lengths of the right paramere.

Gonocoxite (Fig. 16e): more elongate (suboval) than that of *H. armipalpis* (length/width = 0.81), cavea slightly smaller.

Spermatheca (Fig. 16f, g): Proximal portion slightly longer than in *H. armipalpis*.

Secondary sexual characters: Maxillary palpi of male more or less regularly spindle-shaped, not strongly modified, with conspicuous small semicircular excision on mesal margin near base. Meso- and metafemur each with a group of long thin setae along posteroventral margin (sometimes rubbed off on metafemur); in addition, metafemur more strongly dilated than in *H. armipalpis*, distinctly bent and with group of conspicuous denticles near apical third of ventral face. Mesotibia with posteriorly directed setae and with more or less erect setae on mesal face. Metatibia bisinuous, mesal face with two groups of setae (posteriorly-directed and erect).

¹ In the original description of *H. masatakai* (JÄCH & DÍAZ 2003b), the total length of this species was incorrectly given as 1.05–1.15 mm. In fact *H. masatakai* is 2.05–2.15 mm long.

Male sternite X and spicula (Fig. 16d): more or less as in *H. armipalpis*.

Female tergite X (Fig. 16h): slightly more elongate than in *H. armipalpis*, with conspicuous V-shaped apical notch; fringe of vermiform setae distinctly interrupted medially; hyaline margin wide.

HABITAT: For habitat descriptions see above (material and methods) and JÄCH & Ji (1998, 2003): CWBS localities 264, 464, 477, and 495.

DISTRIBUTION: Southern Fujian, northern, northwestern and central Guangdong. It is the first species of *Hydraena* s.str. recorded from Guangdong.

ETYMOLOGY: Named for Hans Ernst Reuter (Bad Nauheim, Germany).

Hydraena (s.str.) *aliciae* sp.n.

TYPE LOCALITY (CWBS loc. 264): Small stream, less than 50 cm wide, only little water running in deep gorge, descending from partly forested Shangfang Shan (summit: ca. 1400 m a.s.l.), forming waterfalls and small pools, surrounded by rice fields and *Cunninghamia* forest, 850 m a.s.l.; 2 km E Shizhong Town, ca. 40 km S Longyan City; Longyan City Region; southern Fujian Province.

TYPE MATERIAL: **Holotype** ♂ (CASS): "CHINA: FUJIAN, Longyan Shizhong, Shangfang Shan 850m, 31.1.1997 leg. Ji & Wang (CWBS 264)". **Paratype** (NMW): 1 ♂, same label data as holotype.

ADDITIONAL MATERIAL EXAMINED: 1 ♀: "CHINA: FUJIAN, Longyan Jiangshan (20 km N Longyan) Keshan monastery, 900m Meihua Shan, 28.1.1997 leg. H.Schönmann (CWBS 260)"; 1 ♀: "CHINA: FUJIAN, Longyan 2 km S Dachi, 750m Ceyan Shan, 29.1.1997 leg. H.Schönmann (CWBS 262)"; 1 ♀: "CHINA: FUJIAN, Longyan 2 km S Dachi, 750m Ceyan Shan, 29.1.1997 leg. Ji & Wang (CWBS 262)". These three females were not accompanied by males; however, due to external resemblance and the geographical vicinity we think that they very probably belong to *H. aliciae*.

DIFFERENTIAL DIAGNOSIS: Habitus as in Fig. 2. In general appearance (colouration, body shape, punctation, secondary sexual characters), this species agrees very well with *Hydraena hansreuteri*. It can be distinguished from the latter mainly by its smaller size (2.1–2.2 mm long) and by the genitalia.

Metafemoral denticles less prominent. Hairs on legs less distinctly developed than in *H. hansreuteri*, setal fringes hardly apparent except for a conspicuous fringe of erect long setae at distal end of metatibia. Mesotibia distinctly dilated apically, more strongly curved. Metatibia not bisinuous.

Aedeagus (Fig. 17a–c): Distinctly smaller than that of *H. hansreuteri*; distal lobe more symmetrical, with two almost equally large, conspicuously setose appendages; right paramere less widely dilated apically.

Male sternite X and spicula (Fig. 17d): more or less as in *H. armipalpis* and *H. hansreuteri*, but sternite X distinctly emarginate apico-laterally.

Female tergite X (Fig. 17h): more triangular and more elongate than in *H. hansreuteri* (length/width = 0.50), discal setae predominantly trifid.

Gonocoxite (Fig. 17e): more elongate than that of *H. armipalpis* (length/width = 0.86), lateral margin more straight.

Spermatheca as in Fig. 17f–g.

HABITAT: For habitat descriptions see above (material and methods) and JÄCH & Ji (1998): CWBS localities 260, 262, 264.

DISTRIBUTION: So far known only from southern Fujian.

ETYMOLOGY: Named for Alicia Díaz, daughter of the junior author.

***Hydraena* (s.str.) *undevigintioctogintasisyphos* sp.n.**

TYPE LOCALITY (CWBS loc. 305): Small stream, ca. 0.5–1.0 m wide, in a deep ravine between rice fields, Jiuling Shan, 800 m a.s.l.; near Dong Xi Ling Village, 35 km W Shangfu City; Fengxin County; Yicun Prefecture; northwestern Jiangxi Province.

TYPE MATERIAL: **Holotype** ♂ (CASS): “CHINA: Jiangxi, Jiuling Shan 35km W Shangfu, 14.11.1997 env. Dong Xi Ling, 800m leg. M. Wang (CWBS 305)”. **Paratypes** (CASS, NMW): 4 exs. (2 ♂♂, 2 ♀♀), same label data as holotype; 1 ♂: “CHINA: Jiangxi, Jiuling Shan 18km NW Shangfu, 12.11.1997 env. Jiu Xian, 700 - 800m leg. Schönmann (CWBS 302)”; 6 exs. (2 ♂♂, 4 ♀♀): “CHINA: Jiangxi, Jiuling Shan 18km NW Shangfu, 15.11.1997 env. Jiu Xian, 800m leg. M. Wang (CWBS 306)”; 2 ♀♀: “CHINA: Hunan, 21.3.2003 NE Nanjiangqiao, Mufu Shan 113°48'03"E 28°57'17"N ca. 600 m, leg. Schönmann, Komarek & Wang (CWBS 503)”; 2 exs. (1 ♂, 1 ♀): “CHINA: Hunan, 21.3.2003 NE Nanjiangqiao, Mufu Shan 113°48'03"E 28°57'17"N ca. 600 m, leg. Schönmann, Komarek & Wang (CWBS 504)”; 52 exs.: “CHINA: Jiangxi, 27.3.2003 ca. 50 km NE Jing'an Town 115°10'13"E 28°57'51"N ca. 530 m, leg. Schönmann, Komarek & Wang (CWBS 513)”; 14 exs.: “CHINA: Jiangxi, 27.3.2003 ca. 70 km NE Jing'an Town 115°11'17"E 29°03'17"N ca. 550 m, leg. Schönmann, Komarek & Wang (CWBS 514)”; 10 exs.: “CHINA: Hunan, 29.3.2003 ca. 5 km N Daduan Town 114°34'53"E 28°36'30"N ca. 450 m, leg. Schönmann, Komarek & Wang (CWBS 517)”; 6 exs.: “CHINA: Hunan, 30.3.2003 Dawei Shan (outside NP) 114°11'10"E 28°25'44"N ca. 1360 m, leg. Schönmann, Komarek & Wang (CWBS 518)”; 16 exs.: “CHINA: Hunan, 31.3.2003 ca. 5 km W Dahu town 113°53'25"E 28°26'21"N ca. 400 m, leg. Schönmann, Komarek & Wang (CWBS 521)”.

DIAGNOSIS: Habitus as in Fig. 3; 1.90–2.15 mm long. Reddish brown to dark blackish brown, frons and elytra usually noticeably darker (blackish brown) than remaining body parts. In general appearance (colouration, body shape) and in the morphology of the male maxillary palpus, this species agrees very well with *Hydraena armipalpis* and *H. masatakai*. Externally, it can be distinguished from *H. armipalpis* mainly by the more densely punctate elytra (seven rows of punctures between suture and shoulder (app. 12 per elytron), by the more slender apical segment of the maxillary palpus, and by the strongly curved male metatibia. It can be distinguished from *H. masatakai* by a number of subtle differences: e.g., male maxillary palpus widest near basal 0.3 (0.4 in *H. masatakai*), male mesotibia without distinct groups of setae. It differs from *H. hansreuteri* and *H. aliciae* in the number of elytral striae, the secondary sexual characters, etc.

Aedeagus (Fig. 18a–c): Main piece with large flattened seta on apex of short subapical ventral appendage; a second seta can be observed on dorsal side of base of distal lobe but there is no trace of the remaining two setae found in *Hydraena armipalpis*, *H. aliciae*, and *H. hansreuteri*. Distal lobe with short apical pubescent appendage and with a thin, comparatively short flagellum. Right paramere very wide (dorsal view), subtruncate, apical part with several groups of very diversely shaped setae.

Gonocoxite (Fig. 18e): very similar to that of *H. masatakai*.

Spermatheca as in Fig. 18f, g.

Secondary sexual characters: Maxillary palpi of male strongly modified as in *H. masatakai* and *H. armipalpis*, but more slender than in these species. Metaventrite and first ventrite between metacoxae more strongly impressed in male. Femora slightly thickened; metafemur with a group of long thin setae along posteroventral margin. Pro- and mesotibia slightly curved; metatibia strongly curved, subapically dilated with a few stiff erect setae.

Male sternite X and spicula as in Fig. 18d.

Female tergite X (Fig. 18h): resembling that of *H. hansreuteri*, but hyaline margin more narrow.

DISCUSSION: *Hydraena undevigintioctogintasisyphos* is undoubtedly closely related with *H. masatakai*. The metatibial shape and the large flattened aedeagal seta can be regarded as synapomorphies.

HABITAT: For habitat descriptions see above (material and methods) and JÄCH & JI (1998): CWBS localities 302, 305, 306, 503, 504, 513, 514, 517, 518, 521.

DISTRIBUTION: So far known only from eastern Hunan and western Jiangxi. It is the first species of *Hydraena* s.str. recorded from Hunan and Jiangxi.

ETYMOLOGY: Named for the Viennese Soccer Club "FC 1980 Wien Sisypchos".

***Hydraena (s.str.) martinschoepfi* sp.n.**

TYPE LOCALITY (CWBS loc. 287): Small stream, < 0.5 m wide, surrounded by tea and vegetable gardens, shaded by bushes and bamboo, pools with leaves, small waterfalls, short sections with water running over crystalline sand and gravel, 350–400 m a.s.l.; 40 km NW Huang Shan City (= Tunxi), on the road from Huang Shan City to Tang Kou Town; Huang Shan NP; Weizhou Prefecture; southern Anhui Province.

TYPE MATERIAL: **Holotype** ♂ (CASS): "CHINA: Anhui, Huang Shan 40km NW Tunxi, 26.10.1997 rd. to Tang Kou, 350 - 400m leg. M. Wang (CWBS 287)". **Paratypes** (CASS, NMW): 6 exs. (3 ♂♂, 3 ♀♀), same label data as holotype; 1 ♀: "CHINA: Anhui, Huang Shan 30km NW Tunxi, 30.10.1997 3 km W Nantang, 350 - 550m leg. Schönmann (CWBS 291)"; 1 ♀: "CHINA: Anhui, Huang Shan 45km NW Tunxi, 1.11.1997 rd. to Tang Kou, 550m leg. Schönmann (CWBS 293)"; 1 ♀: "CHINA: Anhui, Huang Shan 45km NW Tunxi, 1.11.1997 rd. to Tang Kou, 550m leg. Schönmann (CWBS 294)". One of the male paratypes from the type locality lacks the aedeagus.

DESCRIPTION: Habitus as in Fig. 4; 1.90–2.15 mm long. Reddish brown to dark brown, posterior part of frons usually almost black.

Labrum deeply excised medially; margins slightly upturned. Clypeus densely micropunctate, matt. Fronto-clypeal suture arcuate, very faintly impressed. Frons moderately densely punctate medially, rugosely punctate laterally, punctures and lateral interstices densely micropunctate; paraocular grooves shallow. Eyes moderately large, with about 25 facets visible in dorsal view. Maxillary palpi long, distinctly longer than maximum width of pronotum.

Pronotum subhexagonal, strongly constricted anteriorly and more or less sinuately constricted posteriorly, distinctly wider than long (length/width = 0.70); anterior margin distinctly emarginate; anterior angles obtuse; lateral rim crenulate; lateral angles widely rounded; disc more or less flat, rather coarsely, densely and irregularly punctate, interstices glabrous or superficially reticulate; posterior admedian fovea shallow; sublateral groove distinct, strongly impressed subanteriorly and subposteriorly; lateral portion of pronotum slightly deflexed, slightly convex, punctation dense, more rugose than on disc.

Elytra elongate oval; with seven, more or less regular rows of punctures between suture and shoulder (app. 13 rows per elytron); punctures moderately large, deeply impressed (in anterior half of elytra) and not arranged in distinctly impressed lines; intervals hardly convex, glabrous; explanate margin of elytra moderately wide, more or less smooth along entire length, not reaching elytral apex; elytral apices more or less conjointly rounded.

Mentum and submentum microreticulate and micropunctate, matt. Two genal ridges well developed; subocular ridge very distinct; an additional longitudinal genal ridge connects maxillary socket and posterior genal ridge. Gula with large pregenal glabrous area. Prosternum impressed in front of procoxae; with prominent median keel, which is cranially not produced into a distinct spine. Mesoventrite with six longitudinal ridges. Metaventral disc impressed medially (sexually dimorphic); metaventral plaques oblique, moderately wide. Intercostal segment (= ab-

dominal sternite II) very strongly transverse, distinctly wider than long; posterior angles acute. First ventrite with paracoxal pits and with glabrous areas behind metacoxal sockets; abdominal sternite VII with large semicircular non-pubescent area, sternite VIII without dense hydrofuge pubescence. Legs sexually dimorphic.

Aedeagus (Fig. 19a–c): Main piece elongate; strongly curved subbasally (lateral view); with various longitudinal grooves and ridges, and with several appendages; with three thin setae near apical fourth, two on dorsal surface and one on right side; phallobase more or less symmetrical, forming a closed ring. Distal lobe not clearly delimited from main piece, with long and slender, strongly sinuate flagellum, with fimbriate appendage. Right paramere very intricately shaped, consisting obviously of several lobes; with several groups of variously long setae, one of which is very large and conspicuous, horsetail-shaped. Left paramere not well discernable.

Gonocoxite (Fig. 19e): Subsemicircular; lateral margins constricted subbasally; apical area of outer plate well developed; inner plate partly exposed basally, with one moderately large cavea.

Spermatheca (Fig. 19f–g): Proximal portion crescentic; distal portion more or less discoidal.

SECONDARY SEXUAL CHARACTERS: Males on average larger than females. Female elytra less elongate, more abruptly acuminate apically. Metaventrite of male more deeply impressed. All femora of male noticeably thickened. Male mesotibia slightly widened near middle of ventral face, with a row of conspicuous stiff, erect bristles along distal half of ventral face; male metatibia slightly curved in distal half, with a group of inconspicuous setae near apex. Male ventrites 5 and 6 enlarged; middle of ventrite 5 produced apically, slightly asymmetrical; ventrite 6 obliquely grooved near middle. Male tergite IX very long; tergite X with very small, distinctly glabrous, longitudinal groove in middle of apical declivity.

Male sternite X and spicula (Fig. 19d): Sternite X subtriangular, sides distinctly emarginate; not firmly connected with spicula (sternite IX).

Female tergite X (Fig. 19h): transverse; disc sparsely covered with trichoid setae (apical part) and squamose setae (basal half); subapical fringe medially with densely set vermiform setae; ventral (inner) plate basally produced to form asymmetric projection.

VARIABILITY: Anterior margin and/or middle of clypeus sometimes with micropunctuation obsolete. Rows of punctures on elytra sometimes quite irregular.

DIFFERENTIAL DIAGNOSIS: The asymmetric female tergite X is a unique character, not known from any other species of the genus.

HABITAT: For habitat descriptions see above (material and methods) and JÄCH & JI (1998): CWBS localities 287, 291, 293, 294.

DISTRIBUTION: So far known only from Huang Shan in southern Anhui. It is the first species of Hydraenidae recorded from Anhui.

ETYMOLOGY: Named for Martin Schöpf (Wien) for his generous support of the China Water Beetle Survey.

***Hydraena* (s.str.) *lehmanni* sp.n.**

TYPE LOCALITY (CWBS loc. 260): Small stream, ca. 0.5 m wide, partly flowing over granitic rock (incl. small pools), partly running over coarse gravel, turbid, partly shaded by bushes, surrounded by rice fields, 900–1000 m a.s.l.; near Ke Shan Monastery, near Jiangshan (= Tongbo), on the slope of Meihua Shan (summit: ca. 1700 m a.s.l.), 20 km N Longyan City; Longyan City Region; southern Fujian Province.

TYPE MATERIAL: **Holotype** ♂ (CASS): "CHINA: FUJIAN, Longyan Jiangshan (20 km N Longyan) Keshan monastery, 900m Meihua Shan, 28.1.1997 leg. H.Schönmann (CWBS 260)". **Paratypes** (CASS, NMW): 10 exs. (9 ♂♂, 1 ♀), same label data as holotype; 3 ♀♀: "CHINA: FUJIAN, Longyan 2 km S Dachi, 750m Ceyan Shan, 29.1.1997 leg. H.Schönmann (CWBS 262)"; 3 exs. (2 ♂♂, 1 ♀): "CHINA: FUJIAN, Longyan Shizhong, Shangfang Shan 850m, 31.1.1997 leg. H.Schönmann (CWBS 264)".

DESCRIPTION: Habitus as in Fig. 5; 1.8–1.9 mm long. Dark chestnut brown to black, labrum and body appendages dark reddish brown.

Labrum deeply excised medially; margins slightly upturned. Clypeus very densely micropunctate, matt (anterior rim usually glabrous). Fronto-clypeal suture arcuate, very faintly impressed. Frons moderately densely punctate medially, rugosely punctate laterally, punctures and lateral interstices densely micropunctate; paraocular grooves shallow. Eyes moderately large, with about 25 facets visible in dorsal view. Maxillary palpi long, distinctly longer than maximum width of pronotum (sexually dimorphic).

Pronotum subhexagonal, strongly constricted anteriorly and posteriorly, distinctly wider than long (length/width = 0.88); anterior margin distinctly emarginate; anterior angles obtuse; lateral rim crenulate/denticulate; lateral angles widely rounded; disc moderately convex, moderately densely punctate; interstices more or less glabrous, sometimes larger than a puncture diameter; posterior admedian foveae hardly perceptible; sublateral groove distinct, strongly impressed subanteriorly and subposteriorly; lateral portion of pronotum deflexed, slightly convex, punctuation as on disc.

Elytra elongate subparallel; with six, more or less regular rows of punctures between suture and shoulder (app. 11 rows per elytron); punctures moderately large, deeply impressed (in anterior half of elytra) and not arranged in distinctly impressed lines; intervals hardly convex, glabrous; explanate margin of elytra moderately wide, more or less strongly serrate in anterior 0.3, not reaching elytral apex; elytral apices more or less conjointly rounded.

Mentum and submentum microreticulate and micropunctate, matt. Two genal ridges well developed; subocular ridge very distinct; an additional longitudinal genal ridge connects maxillary socket and posterior genal ridge. Gula with large preular glabrous area. Prosternum impressed in front of procoxae; with prominent median keel, which is cranially not produced into a distinct spine. Mesoventrite with five longitudinal ridges. Metaventral disc shallowly impressed medially; metaventral plaques slightly oblique, moderately wide, elongate, reaching metaventral base. Intercostal segment (= abdominal sternite II) subquadrate (very slightly wider than long), posterior angles very acute. First ventrite with paracoxal pits and with glabrous areas behind metacoxal sockets, connected with longitudinal ridge, not reaching posterior margin of ventrite; middle of ventrites 1–4 glabrous (except basal area); abdominal sternites VII and VIII sexually dimorphic. Legs sexually dimorphic.

Aedeagus (Fig. 20a–c): Main piece elongate and slender; strongly curved in basal third (lateral view); strongly excised (lateral view) before conspicuous ventral subapical projection; apical area with three setae, one near apex and two on ventral subapical projection; phallobase more or less symmetrical, forming a large ring. Distal lobe very large, complex and intricately shaped, not clearly delimited from main piece, with variously shaped appendages. Right paramere long and slender, inserted near phallobase; with numerous setae around apex and along ventral margin. Left paramere small, inserted near middle of main piece; with numerous shorter and longer setae, some of which are conspicuously barbed.

Gonocoxite (Fig. 20e): transverse, apically truncate; lateral margins rounded; apical area of outer plate well developed and well delimited, pseudostyli widely separated; inner plate distinctly exposed basally, basal angles strongly acuminately produced; with one moderately large cavea.

Spermatheca (Fig. 20f–g): Proximal portion more or less tubular, strongly curved; distal portion discoidal.

SECONDARY SEXUAL CHARACTERS: Apical segment of male maxillary palpi slightly curved, not as symmetrical as in female. Metaventral plaques slightly more slender in female. All femora and anterior tibia of male noticeably thickened. Ventral face of male mesotibia with three posteriorly directed bristles near middle, distal one distinctly stronger than two anterior ones: ventral face of male metatibia slightly widened near posterior 0.4. Male ventrites 5 and 6 strongly enlarged; female ventrites 5 and 6 with well developed fringes of golden setae.

Male sternite X and spicula (Fig. 20d): Sternite X subtriangular, posterior margin bisinuate, proximally very strongly emarginate; not firmly connected with spicula (sternite IX).

Female tergite X (Fig. 20h): transverse (length/width = 0.61); disc sparsely covered with trichoid setae, some of the basal ones with bifid apex; subapical fringe medially with densely set vermiform setae.

HABITAT: For habitat descriptions see above (material and methods) and JÄCH & JI (1998): CWBS localities 260, 262, 264.

DISTRIBUTION: So far known only from southern Fujian.

ETYMOLOGY: Named for Oliver Lehmann (Wien), editor of “Universum” Magazine.

Hydraena (s.str.) *philippi* sp.n.

TYPE LOCALITY (CWBS loc. 4): Stream between Bride’s Pool and Plover Cove Reservoir; upper course (see JÄCH & JI 1995: Fig. 5) ca. 2 m wide, with pebbles and cobbles, only partly shaded by riparian shrubs, small trees and bamboo, near Wu Kau Tang Village, ca. 125 m a.s.l.; lower course (see JÄCH & JI 1995: Fig. 6) ca. 10–15 m wide, with large volcanic boulders, partly shaded by secondary forest, ca. 50 m a.s.l.; New Territories; Hong Kong.

TYPE MATERIAL: **Holotype** ♂ (NMW): “HONGKONG (3) 1992 N.T.-Plover C. Res. 25.VI. leg. Jäch”. **Paratypes** (CASS, NMW): 2 exs. (1 ♂, 1 ♀), same label data as holotype; 2 ♀♀: “HONGKONG: New T. (172) Plover Cove Country P. 1.5km W Wu Kau Tang, 60m 14.1.1996, leg. Jäch”; 1 ♀: “HONGKONG: New T. (177) Luk Keng area Kai Kuk Shue Ha 14.1.1996, leg. Jäch”; 2 ♀♀: “HONGKONG: New Terr. Tai Po Kau Sp. Area 13.1.1997, forest stream W.D. Shepard (WDS-A-1249)”; 1 ♀: “HONGKONG: N.T. Tai Po Kau Nat. Res. 19.-22-7.1998 leg. C.F. Lee”.

DIFFERENTIAL DIAGNOSIS: Habitus as in Fig. 6; 1.70–1.85 mm long. Black, labrum and body appendages reddish brown to dark brown.

This species is very similar to *H. lehmanni*, from which it can be distinguished by the genitalia and by the following external characters: sublateral pronotal groove less deeply impressed subanteriorly and subposteriorly; elytra slightly shorter, especially in female more oval than subparallel; male mesotibia with only two bristles well visible (proximal bristle thin and adpressed); male metatibia more strongly widened near apical 0.4 (with distinct protuberance) and with several semierect, moderately long setae on ventral face between protuberance and apex. Middle of ventrites 1–4 with glabrous areas.

Aedeagus (Fig. 21a–c): Ventral subapical projection more robust than in *H. lehmanni*, strongly angulate at apex, apical setae larger; main piece obliquely truncate and strongly attenuate (lateral view) subapically, apical part apparently detached. Appendages of distal lobe larger than in *H. lehmanni*. Right paramere slightly larger than that of *H. lehmanni*. Left paramere slightly smaller, its setae much shorter and unmodified.

Male sternite X and spicula (Fig. 21d): Base of sternite X less strongly emarginate than in *H. lehmanni*; spicula (sternite IX) bisinuous (only one specimen examined).

Female tergite X (Fig. 21h): shorter than in *H. lehmanni* (length/width = 0.53), otherwise very similar, with bifid and very few trifid setae.

Gonocoxite (Fig. 21e): Basal angles of inner plate directed less strongly laterad than in *H. lehmanni*; apex with narrow non pubescent area medially; cavae slightly smaller.

Spermatheca as in Fig. 21f–g.

HABITAT: For habitat descriptions see above (material and methods) and JÄCH & Ji (1995): CWBS localities 4, 8, 172, 177.

DISTRIBUTION: Known only from Hongkong. This is the first species of Hydraenidae recorded from Hongkong.

ETYMOLOGY: Named for Philipp Stotter (Perchtoldsdorf).

Hydraena (s.str.) *christoferi* sp.n.

TYPE LOCALITY (CWBS loc. 8): Stream, ca. 3 m wide, through secondary forest, ca. 150–200 m a.s.l.; Tai Po Kau Forest Nature Reserve, Tai Po New Town; New Territories; Hong Kong.

TYPE MATERIAL: **Holotype** ♂ (NMW): “HONGKONG Tai Po Kau 6.8.1977 leg. Dudgeon (K)”. **Paratypes** (CASS, NMW): 14 exs. (3 ♂♂, 11 ♀♀): “HONGKONG, 1977-1979 Benthic Coll. Tai Po Kau leg. Dudgeon”; 1 ♀: “HONGKONG Tai Po Kau 9.3.1978 leg. Dudgeon (K)”; 2 exs. (1 ♂, 1 ♀): “HONGKONG Tai Po Kau 13.4.1978 leg. Dudgeon (K)”; 2 ♀♀: “HONGKONG Tai Po Kau 30.11.1978 leg. Dudgeon (K)”; 3 ♀♀: “HONGKONG Tai Po Kau 30.3.1979 leg. Dudgeon (K)”; 1 ♀: “HONGKONG: New Terr. Tai Po Kau Sp. Area 13.1.1997, forest stream W.D. Shepard (WDS-A-1249)”; 2 ♀♀: “CHINA: FUJIAN, Chong’an Wuyi Shan, 3 km NW Wuyi Gong 300m, 17.1.1997 leg. H.Schönmann (CWBS 246)”; 4 ♀♀: “CHINA: FUJIAN, Chong’an Wuyi Shan, 3 km W Da’an 500m, 19.1.1997 leg. Ji & Wang (CWBS 250)”; 1 ♂: “CHINA: FUJIAN, Chong’an Wuyi Shan, 5 km SE Da’an Lian Dun, 500m, 20.1.1997 leg. H.Schönmann (CWBS 251)”; 4 exs. (2 ♂♂, 3 ♀♀): “CHINA: FUJIAN, Longyan 2 km S Dachì, 750m Ceyan Shan, 29.1.1997 leg. Ji & Wang (CWBS 262)”; 2 ♀♀: “CHINA: FUJIAN, Longyan 2 km S Dachì, 750m Ceyan Shan, 29.1.1997 leg. H.Schönmann (CWBS 262)”; 1 ♀: “CHINA: FUJIAN, Longyan Xiaochi (20 km W Longyan) Meihua Shan, 650m, 30.1.1997 leg. Ji & Wang (CWBS 263)”.

DIFFERENTIAL DIAGNOSIS: Habitus as in Fig. 7; 1.7–1.9 mm long. Black, labrum and body appendages reddish brown to dark brown.

This species is very similar to *H. philippi* (with which it shares the same habitat in Hongkong) and *H. lehmanni*. It can be distinguished from these two species by the genitalia and by the following external characters: apical segment of male maxillary palpus more distinctly curved; sublateral pronotal groove at least subanteriorly more deeply impressed than in *H. philippi*; shape of elytra more or less as in *H. philippi*; male mesotibia with three bristles; male metatibia only very weakly expanded near apical 0.3 (with small protuberance), with several semierect, moderately long setae on ventral face between protuberance and apex (missing in some specimens). Middle of ventrites 1–4 with glabrous areas.

Aedeagus (Fig. 22a–c): Ventral subapical projection less robust and apically more obtusely angulate than in *H. philippi*; apical setae larger than in *H. lehmanni*; main piece (lateral view) distinctly attenuate anterior to ventral subapical projection, but neither obliquely truncate nor strongly emarginate subapically as in *H. philippi* and *H. lehmanni*. Appendages of distal lobe very extensive in lateral view, with a very long and thin flagellum. Right paramere (lateral view) regularly bisinuous. Left paramere similar to that of *H. philippi*.

Male sternite X and spicula (Fig. 22d): Base of sternite X even more strongly excised than in *H. lehmanni*; apical margin shallowly emarginate; not firmly connected with spicula (sternite IX).

Female tergite X (Fig. 22h): slightly longer than in *H. philippi* (length/width = 0.55), otherwise very similar, with several trifid setae.

Gonocoxite (Fig. 22e): Lateral margin of outer plate weakly curved, but strongly constricted before basal condyles, thus condyles sublateral; basal angles of inner plate strongly produced laterad; cavea very small, approximately divided into two equal halves by basal margin of outer plate.

Spermatheca as in Fig. 22f–g.

HABITAT: For habitat descriptions see above (material and methods) and JÄCH & JI (1995, 1998): CWBS localities 8, 246, 250, 251, 262, 263.

DISTRIBUTION: This species is obviously widely distributed in southeast China. So far it is known from northwestern Fujian (Wuji Shan), southern Fujian and from Hongkong.

ETYMOLOGY: Named for Christofer Stotter (Perchtoldsdorf).

***Hydraena* (s.str.) *wangmiaoi* sp.n.**

TYPE LOCALITY (CWBS loc. 287): Small stream, < 0.5 m wide, surrounded by tea and vegetable gardens, shaded by bushes and bamboo, pools with leaves, small waterfalls, short sections with water running over crystalline sand and gravel, 350–400 m a.s.l.; 40 km NW Huang Shan City (= Tunxi), on the road from Huang Shan City to Tang Kou Town; Huang Shan NP; Weizhou Prefecture; southern Anhui Province.

TYPE MATERIAL: **Holotype** ♂ (CASS): “CHINA: Anhui, Huang Shan 40km NW Tunxi, 26.10.1997 rd. to Tang Kou, 350 - 400m leg. Schönmann (CWBS 287)”. **Paratypes** (CASS, NMW): 5 exs. (2 ♂♂, 3 ♀♀), same label data as holotype; 1 ♀: “CHINA: Anhui, Huang Shan 40km NW Tunxi, 26.10.1997 rd. to Tang Kou, 350 - 400m leg. M. Wang (CWBS 287)”; 1 ♂: “CHINA: FUJIAN, Chong’an Wuyi Shan, 3 km NW Wuyi Gong 300m, 17.1.1997 leg. Ji & Wang (CWBS 246)”; 1 ♀: “CHINA: FUJIAN, Chong’an Wuyi Shan, 3 km NW Wuyi Gong 300m, 17.1.1997 leg. H.Schönmann (CWBS 246)”; 3 exs. (1 ♂, 2 ♀♀): “CHINA: FUJIAN, Chong’an Wuyi Shan, 3 km W Da’an 500m, 19.1.1997 leg. Ji & Wang (CWBS 250)”; 3 ♀♀: “CHINA: FUJIAN, Chong’an Wuyi Shan, 3 km W Da’an 500m, 19.1.1997 leg. Schönmann (CWBS 250)”; 1 ♀: “CHINA: FUJIAN, Guangze Wuyi Shan, 12 km S Zhima Li Fang, 400m, 22.1.1997 leg. Ji & Wang (CWBS 252)”.

DIFFERENTIAL DIAGNOSIS: Habitus as in Fig. 8; 1.7–1.8 mm long. Black or blackish brown, labrum and body appendages reddish brown to dark brown.

This species is very similar to the three species described above: *H. lehmanni*, *H. philippi*, and *H. christoferi* (with which it shares the same habitat in Fujian: CWBS localities 246, 250). It can be distinguished from these three species by the genitalia and by the combination of the following external characters: apical segment of male maxillary palpus not curved, almost symmetrical (mesal margin more convex than lateral margin, wider than in female); pronotum narrow (length/width = 0.72), sublateral pronotal groove deeply impressed; male mesotibia with two or three bristles (proximal one very small or missing); male metatibia slightly curved, without significant expansion or protuberance; female metatibia very slightly curved.

Aedeagus (Fig. 23a–c): similar to that of *H. christoferi*; ventral subapical projection more robust; distal lobe comparatively smaller, flagellum much shorter. Right paramere (lateral view) not regularly bisinuous, apically narrowed; setae of left paramere shorter.

Male sternite X and spicula as in Fig. 23d.

Female tergite X (Fig. 23h): very similar to that of *H. lehmanni* (length/width = ca. 0.57).

Gonocoxite (Fig. 23e): Lateral margin of outer plate curved, distinctly constricted before basal condyles, thus condyles placed sublaterally; basal angles of inner plate strongly produced laterad; cavea large, completely covered by outer plate.

Spermatheca as in Fig. 23f–g.

VARIABILITY: Middle of clypeus varies from densely micropunctate to glabrous.

HABITAT: For habitat descriptions see above (material and methods) and JÄCH & JI (1998): CWBS localities 246, 250, 252, 287.

DISTRIBUTION: This species occurs in southern Anhui (Huang Shan) and northwestern Fujian (Wuji Shan).

ETYMOLOGY: Named for Miao Wang (Associate Professor, Institute of Applied Ecology, Academia Sinica, Shenyang; and Deputy Director of Changbai Mountain Research Station), in recognition of his invaluable support, especially during excursions with the senior author. The type series of *H. wangmiaoi* was partly collected by M. Wang.

Hydraena (s.str.) guangxiensis sp.n.

TYPE LOCALITY (CWBS loc. 43): Small, steep mountain stream on the southern slope of Kui Shan Ding (= Helmet Mountain), cataracts, large crystalline boulders, coarse sand, dense vegetation, slopes covered with planted forest, 600–700 m a.s.l.; Liuwan Da Shan; Yülin Prefecture; southeastern Guangxi Autonomous Region.

TYPE MATERIAL: **Holotype** ♂ (CASS): “CHINA, SE-Guangxi Distr. Yulin Liuwan Mts. SW Yulin \ 17.11.1993 Kuishan, 600-700m leg. Schönmann (21)”. **Paratypes** (NMW): 3 exs. (1 ♂, 2 ♀♀): “CHINA, SE-Guangxi Distr. Yulin Liuwan Mts. SW Yulin \ 17.11.1993 Kuishan, 600-700m leg. Schillhammer (21)”.

DIFFERENTIAL DIAGNOSIS: Habitus as in Fig. 9; 1.75–1.80 mm long. Blackish brown, labrum and body appendages reddish brown to dark brown.

This species is very similar to the four species described above: *H. lehmanni*, *H. philippi*, *H. christoferi*, and *H. wangmiaoi*. It can be distinguished from these four species by the genitalia and by the combination of the following external characters: apical segment of male maxillary palpus not modified, more or less symmetrical (not wider than in female); pronotum wide (length/width = 0.66), densely punctate, sublateral pronotal groove deeply impressed; elytra wide (distinctly wider and more widely explanate than in *H. wangmiaoi*); male mesotibia with three bristles (proximal ones small and inconspicuous, third one large and hooked); male metatibia straight, with hardly noticeable swelling near apical 0.4; female metatibia very slightly curved.

Aedeagus (Fig. 24a–c): quite similar to that of *H. wangmiaoi*; ventral subapical projection (lateral view) more evenly curved, less angulate; apex of main piece (lateral view) short and peg-like; flagellum of distal lobe slightly longer. Right paramere (lateral view) very long, distinctly reaching beyond apex of main piece, with apico-ventral excision, without apical setae; left paramere more strongly setose.

Male sternite X and spicula as in Fig. 24d.

Female tergite X (Fig. 24h): wide (length/width = ca. 0.55), disc with bifid, trifid and multifid setae.

Gonocoxite (Fig. 24e): Lateral margin of outer plate strongly curved, condyles sublateral; basal angles of inner plate strongly produced laterad; cavea moderately large.

Spermatheca as in Fig. 24f–g.

VARIABILITY: Elytral punctuation more or less distinctly irregular in subbasal fourth in some specimens.

HABITAT: For habitat description see above (material and methods) and JÄCH & JI (1995): CWBS locality 43.

DISTRIBUTION: This species is known only from the type locality (southeastern Guangxi Autonomous Region). It is the first species of *Hydraena* s.str. recorded from Guangxi.

ETYMOLOGY: Named in reference to the geographical distribution.

***Hydraena* (s.str.) *draconisaurati* sp.n.**

TYPE LOCALITY (CWBS loc. 32): 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.; Jinlong Shan (= Golden Dragon Mountain); ca. 30 km NE Huitong City; Huitong County; Huaihua Prefecture; southwestern Hunan Province.

TYPE MATERIAL: **Holotype** ♂ (CASS): “CHINA, SW-Hunan 1993 NE Huitong, 5.11. Jinlong Shan, 600-650m leg. L. Ji (11)”. **Paratypes** (NMW): 3 exs. (2 ♂♂, 1 ♀): “CHINA, SW-Hunan 1993 NE Huitong, 5.11. Jinlong Shan, 600-650m leg. Schönmann (11)”; 1 ♂: “CHINA, SW-Hunan 1993 NE Huitong, 5.11. Jinlong Shan, 600-650m leg. Schillhammer (11)”.

DIFFERENTIAL DIAGNOSIS: Habitus as in Fig. 10; 1.75–1.90 mm long. Blackish brown to black, labrum and body appendages reddish brown to dark brown.

This species is very similar to the five species described above: *H. lehmanni*, *H. philippi*, *H. christoferi*, *H. wangmiaoi*, and *H. guangxiensis*. It can be distinguished from these five species by the genitalia and by the combination of the following external characters: apical segment of male maxillary palpus straight, more or less symmetrical, distinctly widened (slightly wider than in *H. wangmiaoi*); pronotum comparatively elongate (length/width = 0.75), rather densely punctate (at least in some specimens), sublateral pronotal groove deeply impressed; elytra moderately wide; male mesotibia with two or three bristles (proximal ones small and inconspicuous, third one large and hooked); male metatibia more or less straight, with distinct swelling near apical 0.3.

Aedeagus (Fig. 25a–c): quite similar to that of *H. guangxiensis*; subapical excision of main piece larger; ventral subapical projection (lateral view) smaller; apex of main piece (lateral view) short and peg-like, directed ventrad; expansions of distal lobe smaller, flagellum shorter. Right paramere (lateral view) without apico-ventral excision, apex setose.

Male sternite X and spicula (Fig. 25d): Base of sternite X not emarginate; apical margin shallowly emarginate; sternite X not firmly connected with spicula (sternite IX).

Female tergite X (Fig. 25h): length/width = ca. 0.6, disc with bifid setae (cf. *H. lehmanni*, *H. philippi*, *H. wangmiaoi*).

Gonocoxite (Fig. 25e): Lateral margin of outer plate slightly curved, condyles distinctly sublateral; basal angles of inner plate strongly produced laterad; cavea moderately large.

Spermatheca as in Fig. 25f–g.

HABITAT: For habitat description see above (material and methods) and JÄCH & Ji (1995): CWBS locality 32.

DISTRIBUTION: This species is known only from the type locality (southwestern Hunan).

ETYMOLOGY: draco, -onis (Latin: dragon), auratus (Latin: golden). Named in reference to Jinlong Shan (= Golden Dragon Mountain), where the type material was collected.

***Hydraena (s.str.) stefani* sp.n.**

TYPE LOCALITY (CWBS loc. 41): Fast flowing stream, ca. 1 m wide, unpolluted, partly shaded, gravel and rocks, volcanic, numerous little waterfalls, ca. 350 m a.s.l.; Siuren Village, ca. 80 km E Liuzhou City, ca. 120 km S Guilin; Lipu County; Guilin Prefecture; eastern Guangxi Autonomous Region.

TYPE MATERIAL: **Holotype** ♂ (CASS, presently on long-term loan in NMW): "CHINA, Guangxi Dist. Lipu 120 km S Guilin Berge bei Siuren [mountains near Siuren] \ 12.11.1993 350m leg. L. Ji (19)".

DIFFERENTIAL DIAGNOSIS: Habitus as in Fig. 11; 2.1 mm long. Blackish brown to black, labrum and body appendages reddish brown to dark brown.

This species is similar to the six species described above: *H. lehmanni*, *H. philippi*, *H. christoferi*, *H. wangmiaoi*, *H. guangxiensis*, and *H. draconisaurati*.

It can be distinguished from these species by the genitalia, and by the combination of the following external characters: apical segment of male maxillary palpus curved, ventrally flattened but not excavated; pronotum comparatively elongate (length/width = 0.73); sublateral pronotal groove moderately deeply impressed; male protibia strongly thickened mesally near apical 0.3, ventral surface concave in apical 0.3; mesotibial bristles less contiguous than in *H. huangshanensis*, second bristle basally fused with third; in dorsal view (Fig. 11) male metatibia more or less straight in anterior half but very slightly curved in posterior half, and slightly curved in lateral view (!), with prominent projection at 0.5. Middle of ventrites 1–4 with glabrous areas.

Aedeagus (Fig. 26a–c): somewhat similar to those of *H. guangxiensis* and *H. draconisaurati*; ventral subapical projection of main piece very long, acuminate apically; apex of main piece almost completely reduced; expansions of distal lobe very large, flagellum shorter than in *H. guangxiensis*. Right paramere very long, distinctly reaching beyond apex of main piece, without apico-ventral excision, apex setose; left paramere wider.

Male sternite X and spicula (Fig. 26d): resembling *H. guangxiensis*, but apical margin of sternite X only very shallowly emarginate.

HABITAT: For habitat description see above (material and methods) and JÄCH & Ji (1995): CWBS locality 41.

DISTRIBUTION: This species is known only from the type locality (Guilin Prefecture, eastern Guangxi Autonomous Region).

ETYMOLOGY: Named for Stefan Schödl (†), in recognition of his excellent contribution to the knowledge of water beetles.

***Hydraena (s.str.) guilin* sp.n.**

TYPE LOCALITY (CWBS loc. 41): Fast flowing stream, ca. 1 m wide, unpolluted, partly shaded, gravel and rocks, volcanic, numerous little waterfalls, ca. 350 m a.s.l.; Siuren Village, ca. 80 km E Liuzhou City, ca. 120 km S Guilin; Lipu County; Guilin Prefecture; eastern Guangxi Autonomous Region.

TYPE MATERIAL: **Holotype** ♂ (CASS, presently on long-term loan in NMW): "CHINA, Guangxi Dist. Lipu 120 km S Guilin Berge bei Siuren [mountains near Siuren] \ 12.11.1993 350m leg. L. Ji (19)". **Paratypes** (NMW): 2 ♀ ♀: "CHINA, Guangxi Dist. Lipu 120 km S Guilin Berge bei Siuren \ 12.11.1993 350m leg. Schillhammer (19)".

DIFFERENTIAL DIAGNOSIS: Habitus as in Fig. 12; 2.0–2.1 mm long. Blackish brown to black, labrum and body appendages reddish brown to dark brown.

This species is very similar to the seven species described above: *H. lehmanni*, *H. philippi*, *H. christoferi*, *H. wangmiaoi*, *H. guangxiensis*, *H. draconisaurati*, and *H. stefani* (with which it shares the same type locality: CWBS locality 41). It can be distinguished from these species by the genitalia, by its size, and by the combination of the following external characters: apical segment of male maxillary palpus curved; pronotum comparatively elongate (length/width = 0.74), sublateral pronotal groove moderately deeply impressed (cf. *H. christoferi*); elytra moderately wide, strongly convex; male mesotibia with three bristles; male metatibia more or less straight, with distinct swelling near apical 0.26 and with subapical emargination. Middle of ventrites 1–4 with glabrous areas.

Aedeagus (Fig. 27a–c): superficially similar to that of *H. christoferi*; subapical excision of main piece short and deep; ventral subapical projection large, its apical part not distinctly angulate, apex subtruncate; apex of main piece (lateral view) long and slender; expansions of distal lobe very large, flagellum very long and thin. Right paramere (lateral view) very similar to that of *H. christoferi*.

Male sternite X and spicula (Fig. 27d): similar to *H. christoferi*.

Female tergite X (Fig. 27h): length/width = ca. 0.62, disc with bifid setae (cf. *H. christoferi*).

Gonocoxite (Fig. 27e): Lateral margin of outer plate rather distinctly curved (especially subbasally), condyles distinctly sublateral; middle of inner plate only narrowly exposed basally, basal angles strongly produced laterad; cavea moderately large.

Spermatheca as in Fig. 27f–g.

VARIABILITY: Punctuation on pronotal disc varies from moderately dense to very dense.

HABITAT: For habitat description see above (material and methods) and JÄCH & JI (1995): CWBS locality 41.

DISTRIBUTION: This species is known only from the type locality (Guilin Prefecture, eastern Guangxi Autonomous Region).

ETYMOLOGY: Named for Guilin Prefecture, a tourist area world-famous for its scenic rock cones.

Hydraena (s.str.) *huangshanensis* sp.n.

TYPE LOCALITY (CWBS loc. 285): 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.; Qi Yun Shan near Yan Qian, 30 km W Huang Shan City (= Tunxi); Huang Shan NP; Weizhou Prefecture; southern Anhui Province.

TYPE MATERIAL: **Holotype** ♂ (CASS): “CHINA: Anhui, Huang Shan 30km NW Tunxi, 24.10.1997 Qi Yun Shan, 250m leg. Schönmann (CWBS 285)”. **Paratypes** (CASS, NMW): 3 exs. (1 ♂, 2 ♀♀), same label data as holotype.

DIFFERENTIAL DIAGNOSIS: Habitus as in Fig. 13; 1.85–1.95 mm long (males larger). Blackish brown, body appendages reddish brown to dark brown.

This species is similar to the eight species described above: *H. lehmanni*, *H. philippi*, *H. christoferi*, *H. wangmiaoi*, *H. guangxiensis*, *H. draconisaurati*, *H. stefani*, and *H. guilin*. It can be distinguished from these species by the genitalia, and by the combination of the following external characters: apical segment of male maxillary palpus curved, distinctly excavated ventrally; middle of clypeus not densely micropunctate; pronotum comparatively elongate (length/width = 0.73), more convex in male; sublateral pronotal groove deeply impressed;

mesotibial bristles contiguous, basally fused; male metatibia straight, attenuate apically, with distinct tooth-like projection in apical 0.43. Middle of ventrites 1–4 with glabrous areas.

Aedeagus (Fig. 28a–c): agrees in principle characters with the other species of the lineage (main piece with distinct subapical excision and with subapical projection in lateral view; position of main piece setae; distal lobe with extensive expansions and a thin flagellum; left paramere very short). However, the aedeagus of *H. huangshanensis* deviates from the species described above in a number of characters: e.g. main piece short and stout, subapical projection very short; right paramere foot-shaped, with a group of long, conspicuously serrate setae near middle.

Male sternite X and spicula (Fig. 28d): Sternite X distinctly transverse; base not emarginate; lateral margins and apex shallowly emarginate; sternite X not firmly connected with spicula (sternite IX).

Female tergite X (Fig. 28h): distinctly transverse (length/width = ca. 0.53), disc with few bifid setae.

Gonocoxite (Fig. 28e): Lateral margin of outer plate rather distinctly curved (especially subbasally), condyles exposed; middle of inner plate not exposed basally, basal angles somewhat retracted, produced laterad; cavea moderately large.

Spermatheca as in Fig. 28f–g.

VARIABILITY: Rows of punctures on elytra vary from very regular to quite irregular.

HABITAT: For habitat description see above (material and methods) and JÄCH & JI (1998): CWBS locality 285.

DISTRIBUTION: So far known only from Huang Shan in southern Anhui.

ETYMOLOGY: Named for the world-famous Huang Shan (Yellow Mountain) National Park.

Hydraena (s.str.) huitongensis sp.n.

TYPE LOCALITY (CWBS loc. 30): Small stream, flowing through planted forest (Chinese fir, *Cunninghamia lanceolata*) and rice fields, slightly polluted, ca. 350 m a.s.l.; ca. 5 km N of upper Research Station of Academia Sinica, Moshao Village, ca. 15 km W Guangping Township; Huitong County; Huaihua Prefecture; southwestern Hunan Province.

TYPE MATERIAL: **Holotype** ♂ (CASS): “CHINA, SW-Hunan 1993 SW Huitong, 4.11. Umg. [surroundings of] Guangping, 350m leg. Schönmann (10)”. **Paratypes** (CASS, NMW): 12 exs. (2 ♂♂, 10 ♀♀), same label data as holotype; 23 exs. (1 ♂, 22 ♀♀): “CHINA, SW-Hunan 1993 SW Huitong, 4.11. Umg. [surroundings of] Guangping, 350m leg. L. JI (10)”; 14 ♀♀: “CHINA, SW-Hunan 1993 SW Huitong, 4.11. Umg. [surroundings of] Guangping, 350m leg. Schillhammer (10)”; 4 exs. (1 ♂, 3 ♀♀): “CHINA, SW-Hunan 1993 SW Huitong, 7.11. Umg. [surroundings of] Guangping, 400m leg. Schillhammer (14)”; 8 exs. (2 ♂♂, 6 ♀♀): “CHINA, SW-Hunan 1993 SW Huitong, 7.11. Umg. [surroundings of] Guangping, 400m leg. L. JI (14)”; 3 exs. (1 ♂, 2 ♀♀): “CHINA: Guizhou, Jiangkou Co. ca. 39 km SW Jiangkou 3.5 km W Guanhe vill. 27°32.70'N 108°38.63'E \ 29.6.2001, ca.650 m leg. Schillhammer & Wang (CWBS (CWBS 442))”.

DIFFERENTIAL DIAGNOSIS: Habitus as in Fig. 14; 1.75–1.80 mm long. Black, body appendages dark brown.

This species is similar to the nine species described above: *H. lehmanni*, *H. philippi*, *H. christoferi*, *H. wangmiaoi*, *H. guangxiensis*, *H. draconisaurati*, *H. stefani*, *H. guilin*, and *H. huangshanensis*. It can be distinguished from these species by the genitalia, and by the combination of the following external characters: apical segment of male maxillary palpus more or less straight, thickened, ventral surface slightly concave in basal half; pronotum strongly convex in male; sublateral pronotal groove only shallowly impressed; male protibia with a row of erect spines on apical mesal margin; mesotibial bristles almost contiguous, basally not fused;

male metatibia distinctly curved (dorsal view), apical half expanded ventrad, with mesal surface flattened and glabrous and with a short subapical row of bristles with blunt apex; female metatibia hardly noticeably curved. Middle of ventrites 1–4 (sparsely) pubescent, without distinctly glabrous areas.

Aedeagus (Fig. 29a–c): agrees in several principle characters with the other species of the *H. lehmanni* complex (main piece with subapical ventral projection; position of setae on main piece; distal lobe with extensive expansions and a flagellum). However, the aedeagus of *H. huitongensis* deviates from the nine species described above in a number of characters: main piece slender, distinctly sinuate (ventral/dorsal view), without distinct subapical ventral excision, ventral subapical projection small, distal lobe with cluster of densely arranged setae; right paramere slender, apically recurved; left paramere long, inserted near basal 0.3 of main piece.

Male sternite X and spicula (Fig. 29d): Sternite X elongate, subtriangular; base distinctly emarginate; lateral margins and apex shallowly emarginate; sternite X not firmly connected with spicula (sternite IX).

Female tergite X (Fig. 29h): length/width = ca. 0.53, disc with few bifid setae.

Gonocoxite (Fig. 29e): Lateral margin of outer plate hardly curved, condyles strongly retracted; basal angles of inner plate produced laterad; cavea moderately large.

Spermatheca as in Fig. 29f–g.

VARIABILITY: Elytral punctation varies from dense to sparse, and from almost regular to distinctly irregular.

HABITAT: For habitat descriptions see above (material and methods) and JÄCH & Ji (1995): CWBS localities 30, 35, and 442.

DISTRIBUTION: This species is known from two localities in southwestern Hunan and from one locality in northeastern Guizhou. It is the first species of *Hydraena* s.str. recorded from Guizhou.

ETYMOLOGY: Named for Huitong, Academia Sinica Research Station. *Hydraena huitongensis* seems to be quite abundant in the vicinity of this Research Station.

Hydraena (s.str.) *jilanzhui* sp.n.

TYPE LOCALITY (CWBS loc. 21): Small, right side tributary of Pipa Xi, short steep stretch with small waterfalls and big boulders, accumulations of decaying plant material, rocks partly covered with moss, shaded, ca. 650 m a.s.l.; Zhangjiajie Forest National Park, Suoxiyü Nature Reserve, Wulingyüan section (ca. 30 km N Dayong City); Dayong County; Xiangxi Prefecture; northwestern Hunan Province.

TYPE MATERIAL: **Holotype** ♂ (CASS): “CHINA, NW-Hunan 1993 Wulingyuan, N Dayong Zangjiajie, 29.10., 650m leg. L. Ji (2)”. **Paratypes** (CASS, NMW): 60 exs. (32 ♂♂, 28 ♀♀), same label data as holotype; 62 exs. (41 ♂♂, 21 ♀♀): “CHINA, NW-Hunan 1993 Wulingyuan, N Dayong Zangjiajie, 29.10., 650m leg. Schillhammer (1)”; 18 ♀♀: “CHINA, NW-Hunan 1993 Wulingyuan, N Dayong Zangjiajie, 29.10., 650m leg. Schönmann (1)”.

DESCRIPTION: Habitus as in Fig. 15; 1.8–2.0 mm long (without exposed abdominal apex). Blackish brown to black, body appendages distinctly paler (yellowish brown to reddish brown).

Labrum deeply excised medially; margins slightly upturned. Clypeus largely glabrous, densely microreticulate laterally. Fronto-clypeal suture arcuate, very faintly impressed. Frons moderately densely to sparsely punctate and shiny medially, rugosely punctate and microreticulate laterally; paracocular grooves shallow. Eyes moderately large, with about 25 facets visible in dorsal view.

Maxillary palpi not sexually dimorphic, distinctly longer than maximum width of pronotum, mesal margin more convex than lateral margin.

Pronotum subhexagonal, strongly constricted anteriorly and posteriorly, distinctly wider than long (length/width = ca. 0.68–0.70); anterior margin distinctly emarginate; anterior angles obtuse; lateral rim denticulate; lateral angles widely rounded; disc moderately convex, moderately densely punctate; interstices more or less glabrous, often several times larger than a puncture diameter; posterior admedian foveae hardly perceptible; sublateral groove distinct, very strongly impressed subanteriorly and subposteriorly; lateral portion of pronotum not strongly deflexed, slightly convex, more or less densely punctate, superficially microreticulate.

Shape of elytra sexually dimorphic, elongate suboval; disc with about 7–8, more or less regular rows of punctures between suture and shoulder (app. 13 rows per elytron); punctures moderately large, moderately deeply impressed (in anterior half of elytra) and not arranged in distinctly impressed lines; intervals not distinctly convex, glabrous; explanate margin of elytra moderately wide, more or less strongly serrate in anterior 0.3, almost reaching elytral apex.

Mentum and submentum microreticulate and micropunctate, matt. Genal ridges well developed; subocular ridge distinct; an additional longitudinal genal ridge connects maxillary socket and posterior genal ridge. Gula with large pregular glabrous area. Prosternum impressed in front of procoxae; with prominent median keel, which is cranially not produced into a distinct spine. Mesoventrite with four longitudinal lateral/sublateral ridges and a hardly perceptible, short median ridge. Metaventral disc shallowly impressed medially; metaventral plaques subparallel, moderately wide, elongate, reaching metaventral base. Intercostal segment (= abdominal sternite II) subtrapezoidal (very slightly wider than long), posterior angles very acute. First ventrite with glabrous areas behind metacostal sockets, without connecting longitudinal ridge; middle of ventrites 1–4 completely pubescent; abdominal sternites VII and VIII sexually dimorphic. Legs sexually dimorphic.

Aedeagus (Fig. 30a–c): Main piece elongate and slender; basal curvature short (lateral view); with conspicuous longitudinal lamina, forming wide dorsolateral groove for reception of right paramere; with three well developed setae, two ventral subapical ones and a dorsal one near apical 0.24; phallobase strongly asymmetrical. Distal lobe intricately shaped, not clearly delimited from main piece, with variously shaped appendages, the longest of which is strongly sinuous and apically produced and flagellum-like. Right paramere long and slender, inserted near phallobase, apically curved ventrad; moderately densely setose around apex and along ventral margin. Left paramere short and wide, inserted near basal 0.4 of main piece; with numerous longer apical and subapical setae, some of which are inconspicuously barbed.

Gonocoxite (Fig. 30e): subquadrate, slightly wider than long, apically rounded; apical area of outer plate well developed and well delimited, lateral margins slightly rounded (almost straight), but condyles strongly retracted and curved medially; pseudostyli moderately widely separated; inner plate distinctly exposed basally, basal angles obtuse, not distinctly produced; caeva moderately large.

Spermatheca (Fig. 30f–g): Proximal portion crescentic, angulate; distal portion tubular-discoidal, small.

SECONDARY SEXUAL CHARACTERS: Male elytral apices subtruncate, apical margin straight or very slightly concave, sutural intervals slightly projecting and tooth-like, tergite X largely exposed and visible in dorsal view. Metaventral plaques slightly more slender in female. All femora of male thickened. Mesotibia of male curved, ventral face with distinct tooth-like expansion and with row of very short bristles in basal 0.23. Metatibia of male straight, with distinct tooth-like expansion in basal 0.30. Middle of ventrites 1–4 without conspicuous glabrous areas. Male ventrite 6 strongly enlarged; female ventrites 5 and 6 with fringes of golden setae.



Fig. 1: Habitus of *Hydraena* (s.str.) *hansreuteri*.



Fig. 2: Habitus of *H. (s.str.) aliciae*.

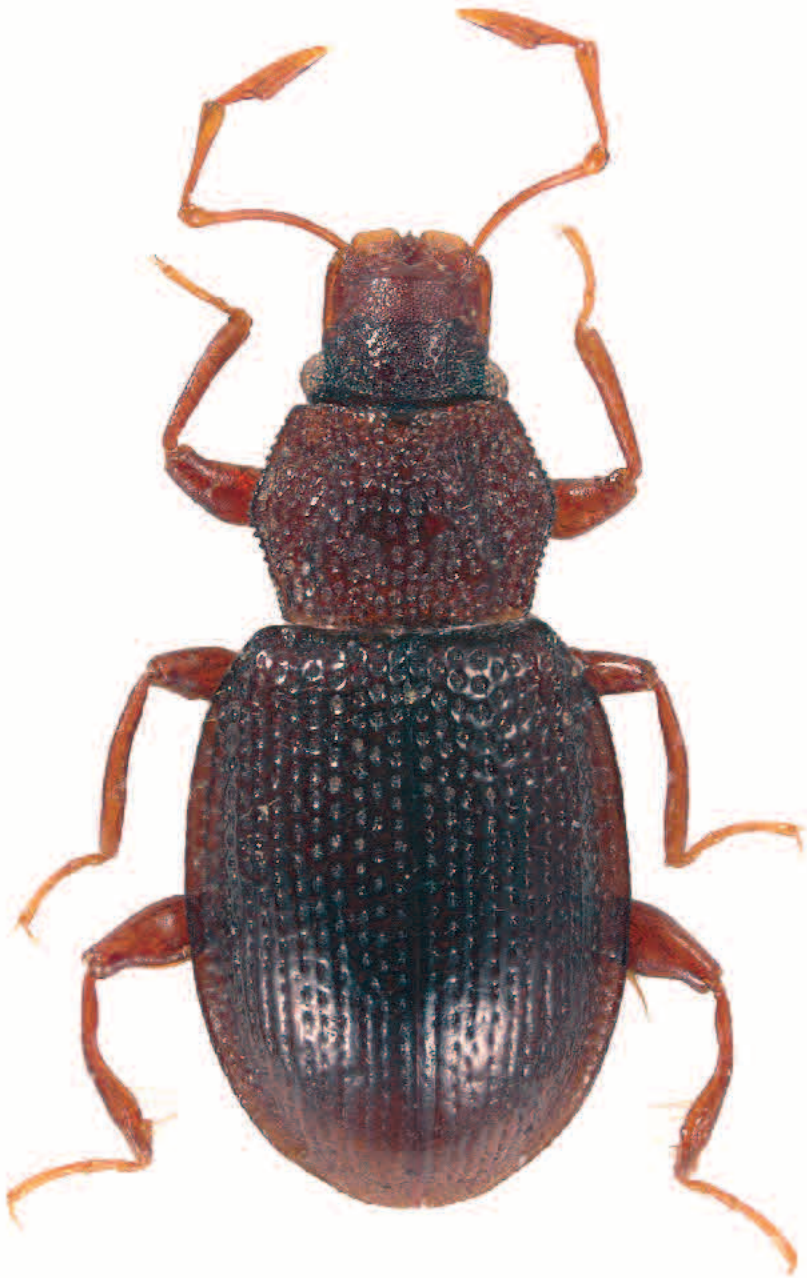


Fig. 3: Habitus of *H. (s.str.) undevigintioctogintasisyphos*.

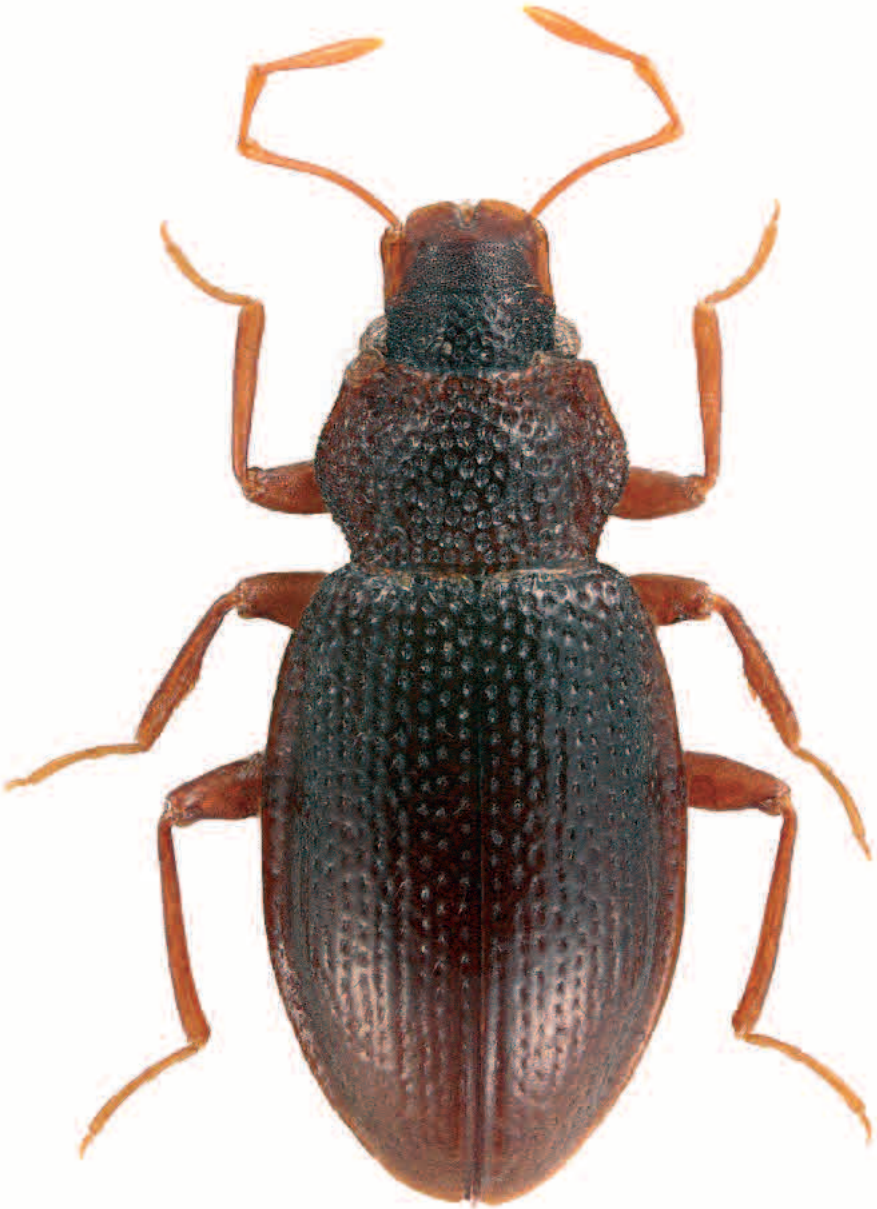


Fig. 4: Habitus of *H. (s.str.) martinschoepfi*.



Fig. 5: Habitus of *H. (s.str.) lehmanni*.



Fig. 6: Habitus of *H. (s.str.) philippi*.



Fig. 7: Habitus of *H. (s.str.) christoferi*.



Fig. 8: Habitus of *H. (s.str.) wangmiaoi*.

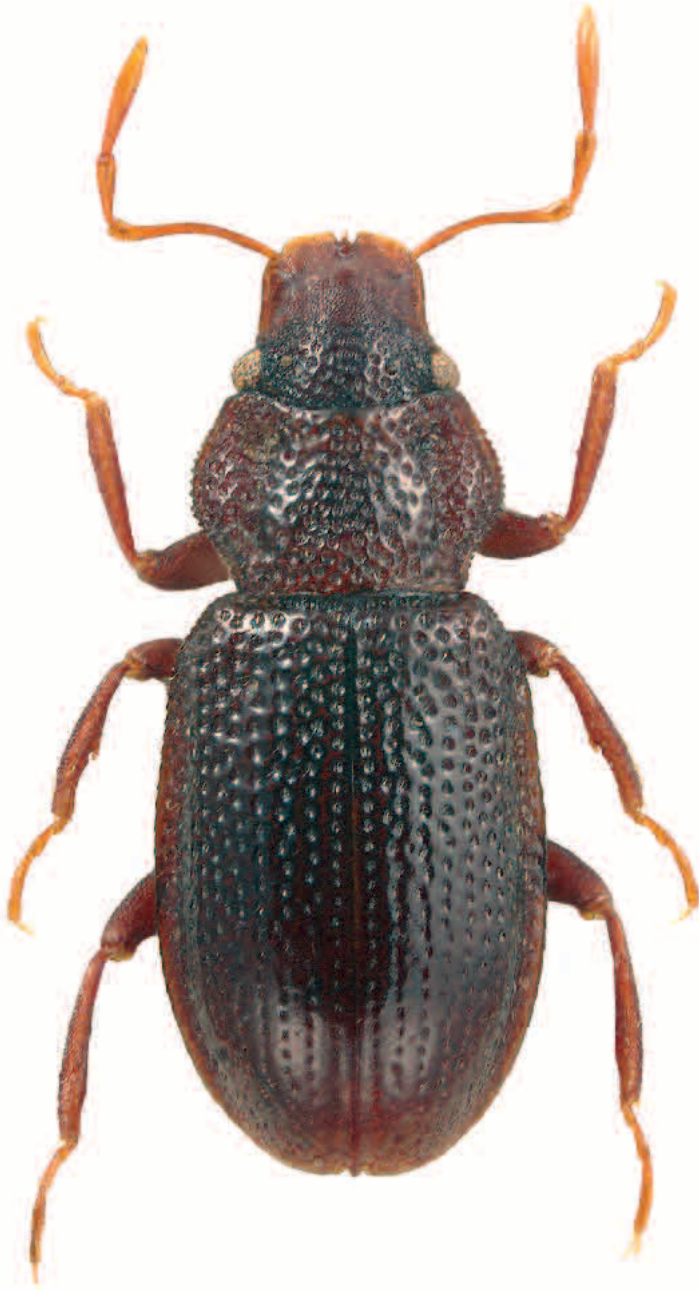


Fig. 9: Habitus of *H. (s.str.) guangxiensis*.



Fig. 10: Habitus of *H. (s.str.) draconisaurati*.



Fig. 11: Habitus of *H. (s.str.) stefani*.



Fig. 12: Habitus of *H. (s.str.) guilin*.



Fig. 13: Habitus of *H. (s.str.) huangshanensis*.



Fig. 14: Habitus of *H. (s.str.) huitongensis*.



Fig. 15: Habitus of *H. (s.str.) jilanzhui*.

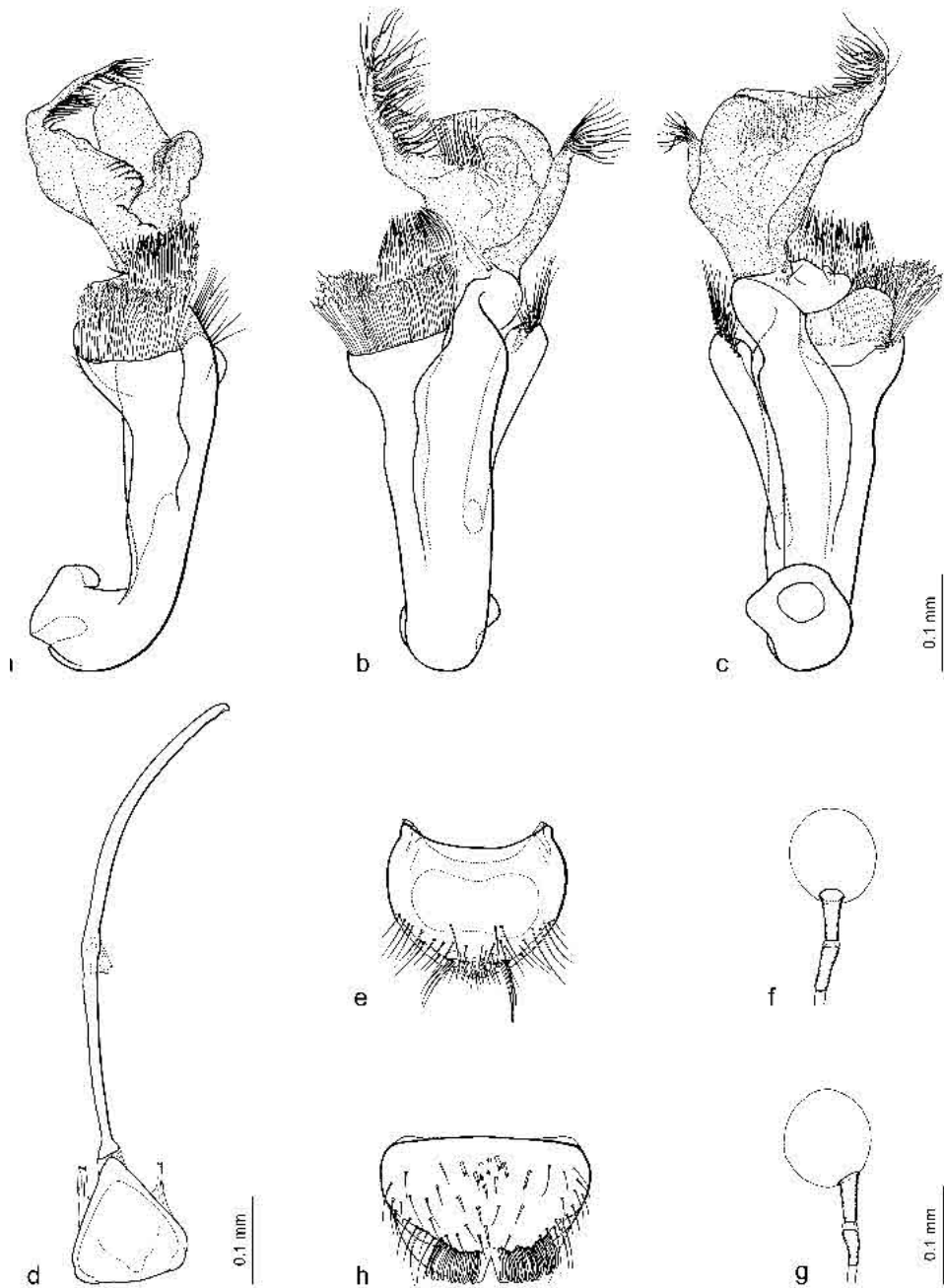


Fig. 16: *Hydraena* (s.str.) *hansreuteri*: a–c) aedeagus in lateral, dorsal and ventral view; d) male sternite X and spicula; e) gonocoxite; f–g) spermatheca; h) female tergite X.

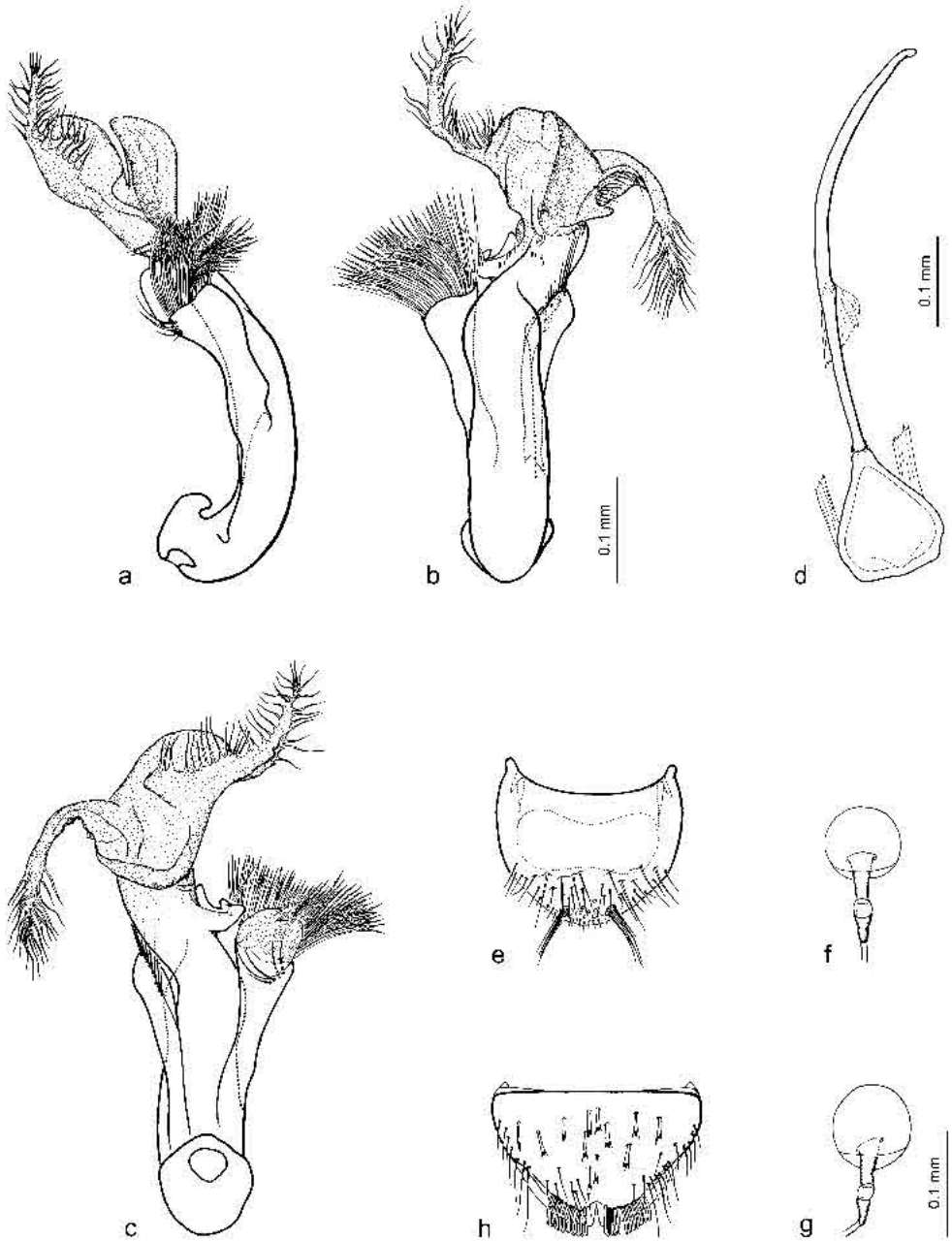


Fig. 17: *Hydraena* (s.str.) *aliciae*: a–c) aedeagus in lateral, dorsal and ventral view; d) male sternite X and spicula; e) gonocoxite; f–g) spermatheca; h) female tergite X.

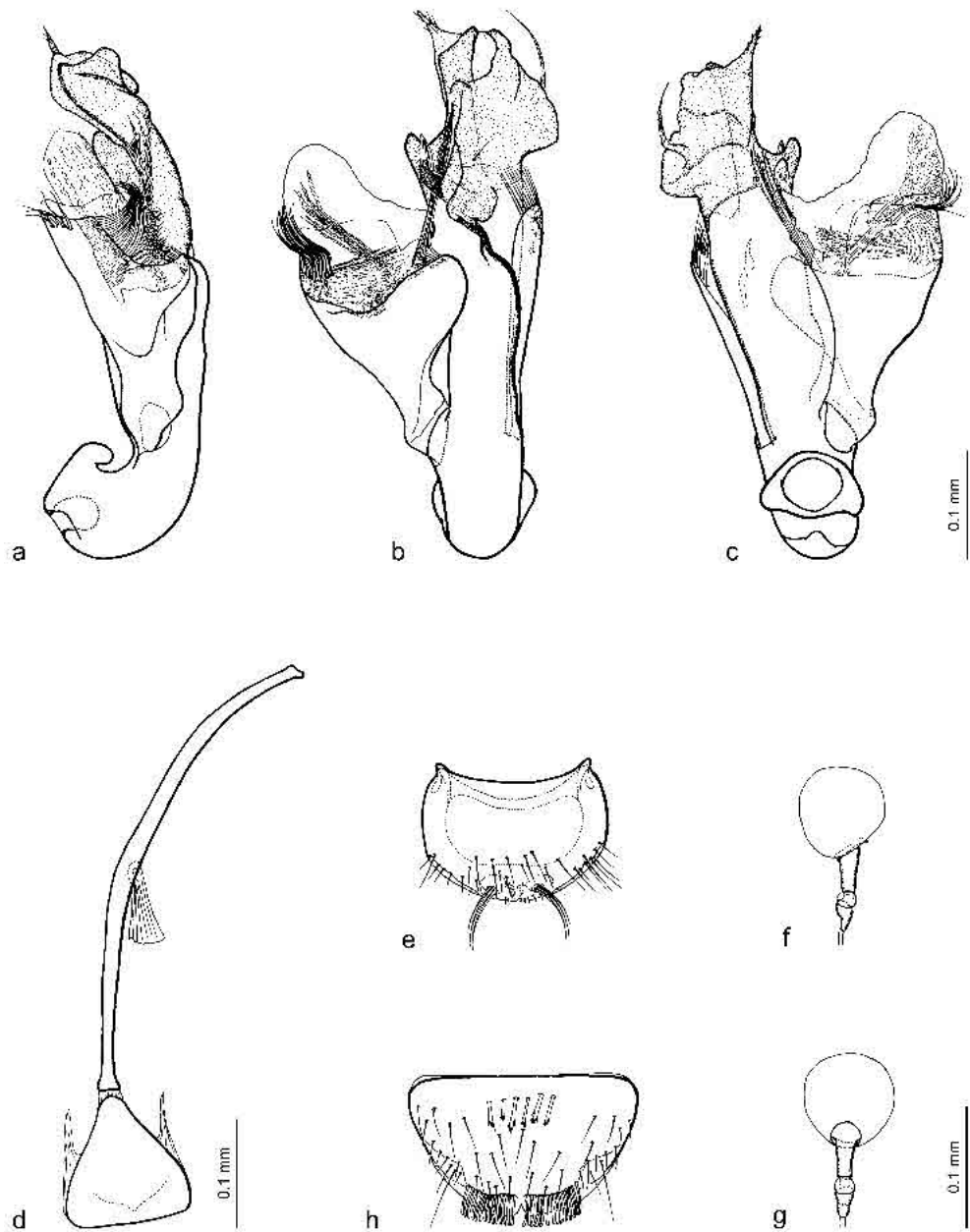


Fig. 18: *Hydraena* (s.str.) *undevigintioctogintasisyphos*: a–c) aedeagus in lateral, dorsal and ventral view; d) male sternite X and spicula; e) gonocoxite; f–g) spermatheca; h) female tergite X.

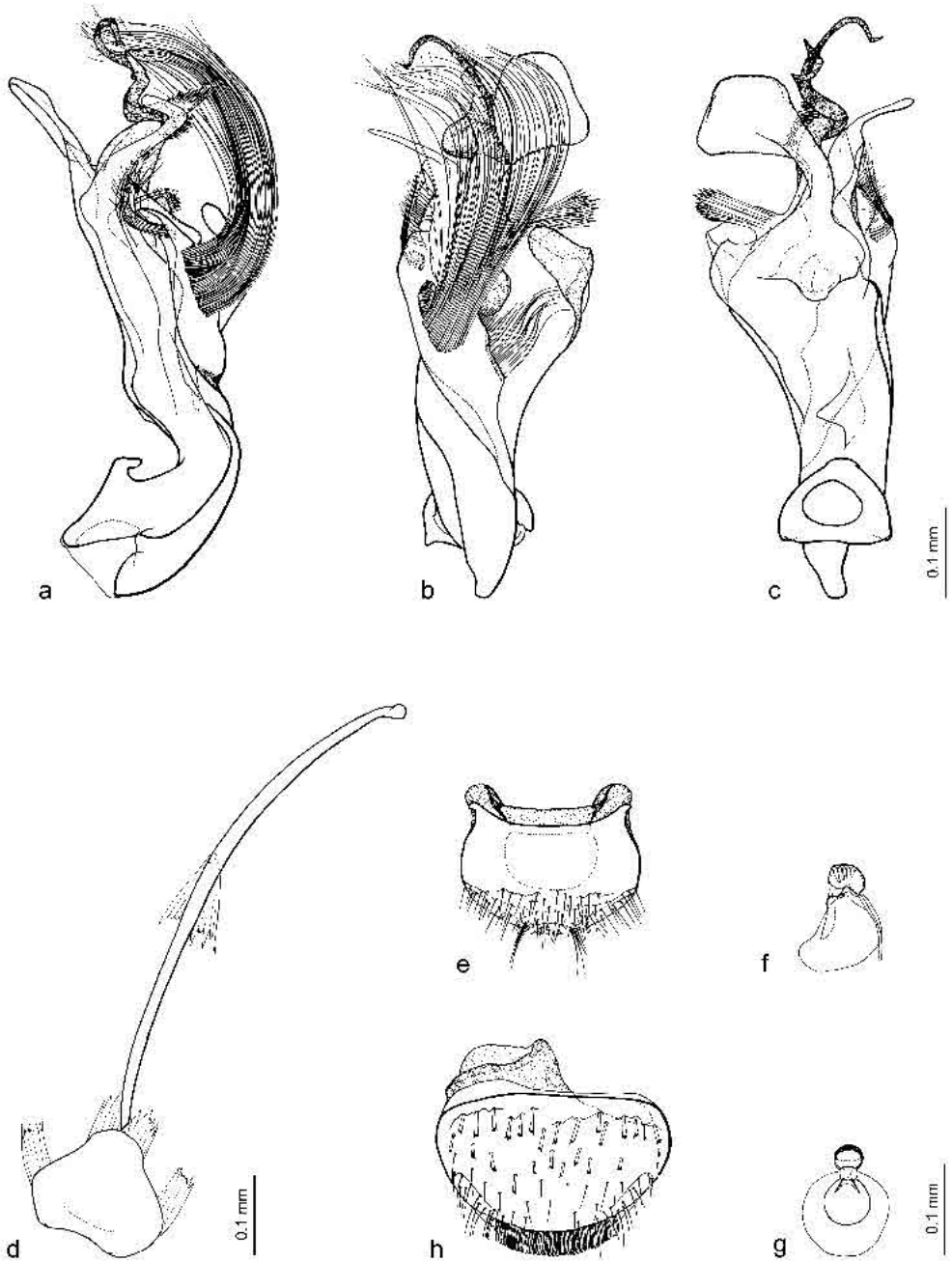


Fig. 19: *Hydraena* (s.str.) *martinschoepfi*: a–c) aedeagus in lateral, dorsal and ventral view (horse-tail setae omitted in ventral view); d) male sternite X and spicula; e) gonocoxite; f–g) spermatheca; h) female tergite X.

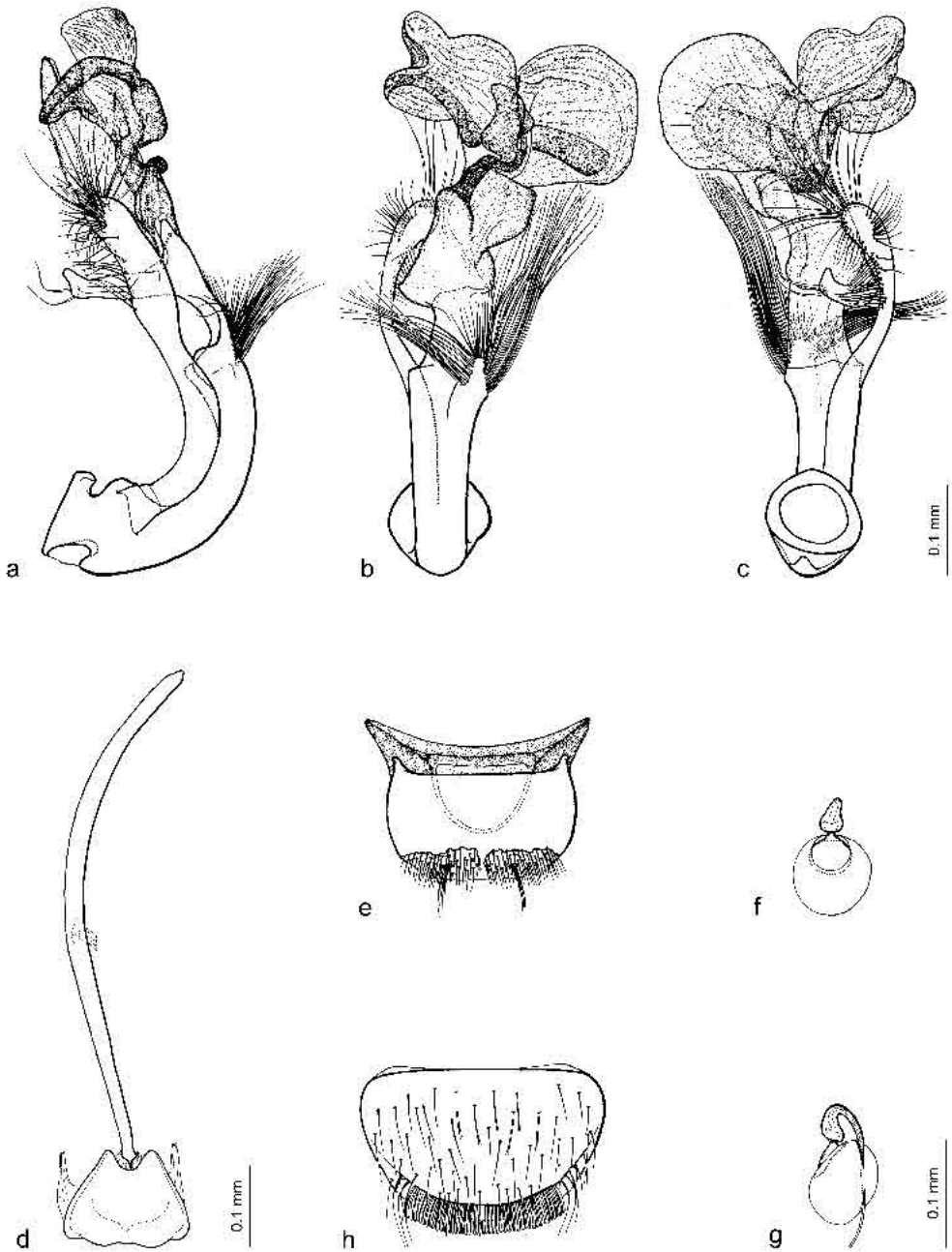


Fig. 20: *Hydraena* (s.str.) *lehmanni*: a–c) aedeagus in lateral, dorsal and ventral view; d) male sternite X and spicula; e) gonocoxite; f–g) spermatheca; h) female tergite X.

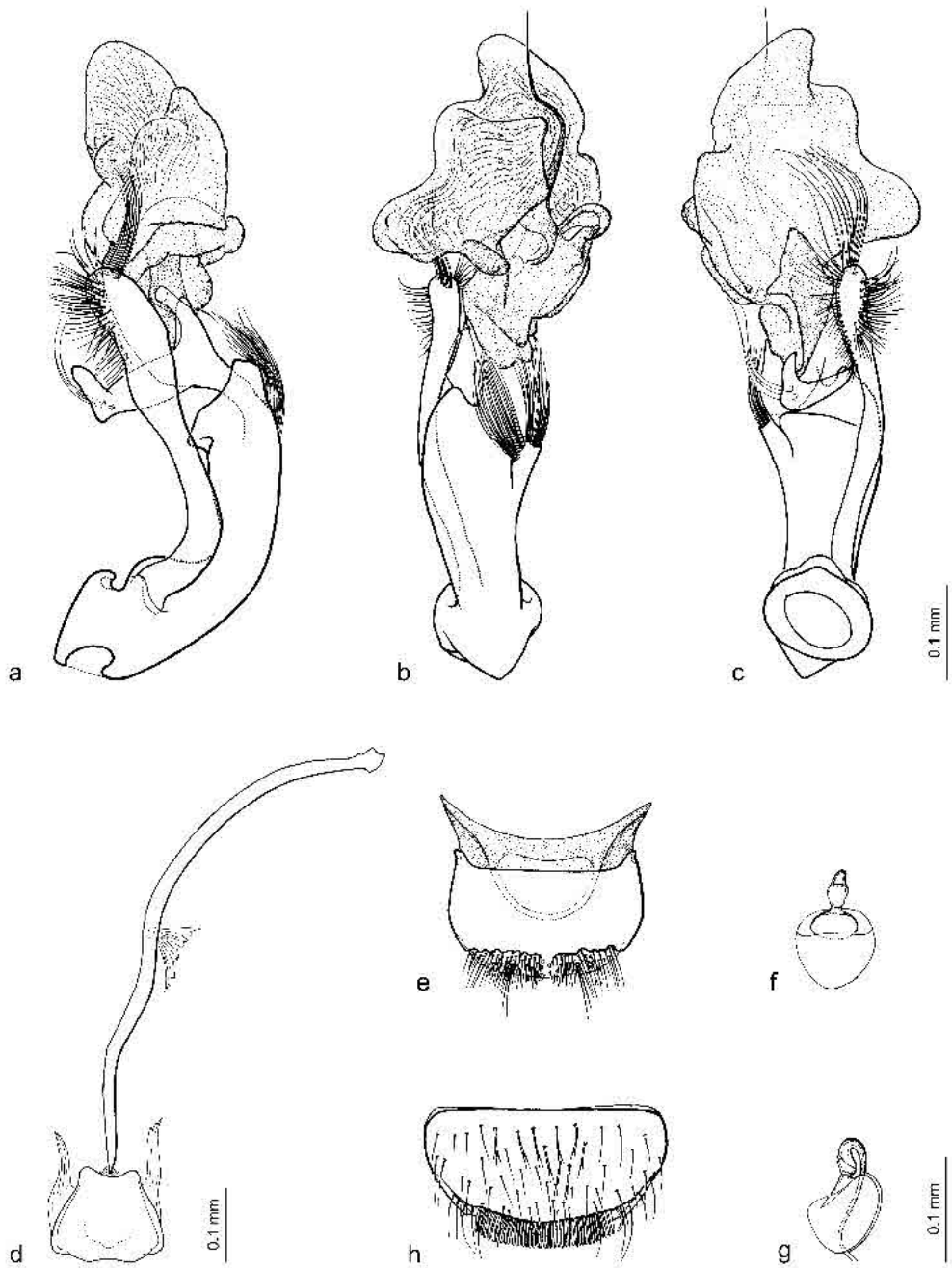


Fig. 21: *Hydraena* (s.str.) *philippi*: a–c) aedeagus in lateral, dorsal and ventral view; d) male sternite X and spicula; e) gonocoxite; f–g) spermatheca; h) female tergite X.

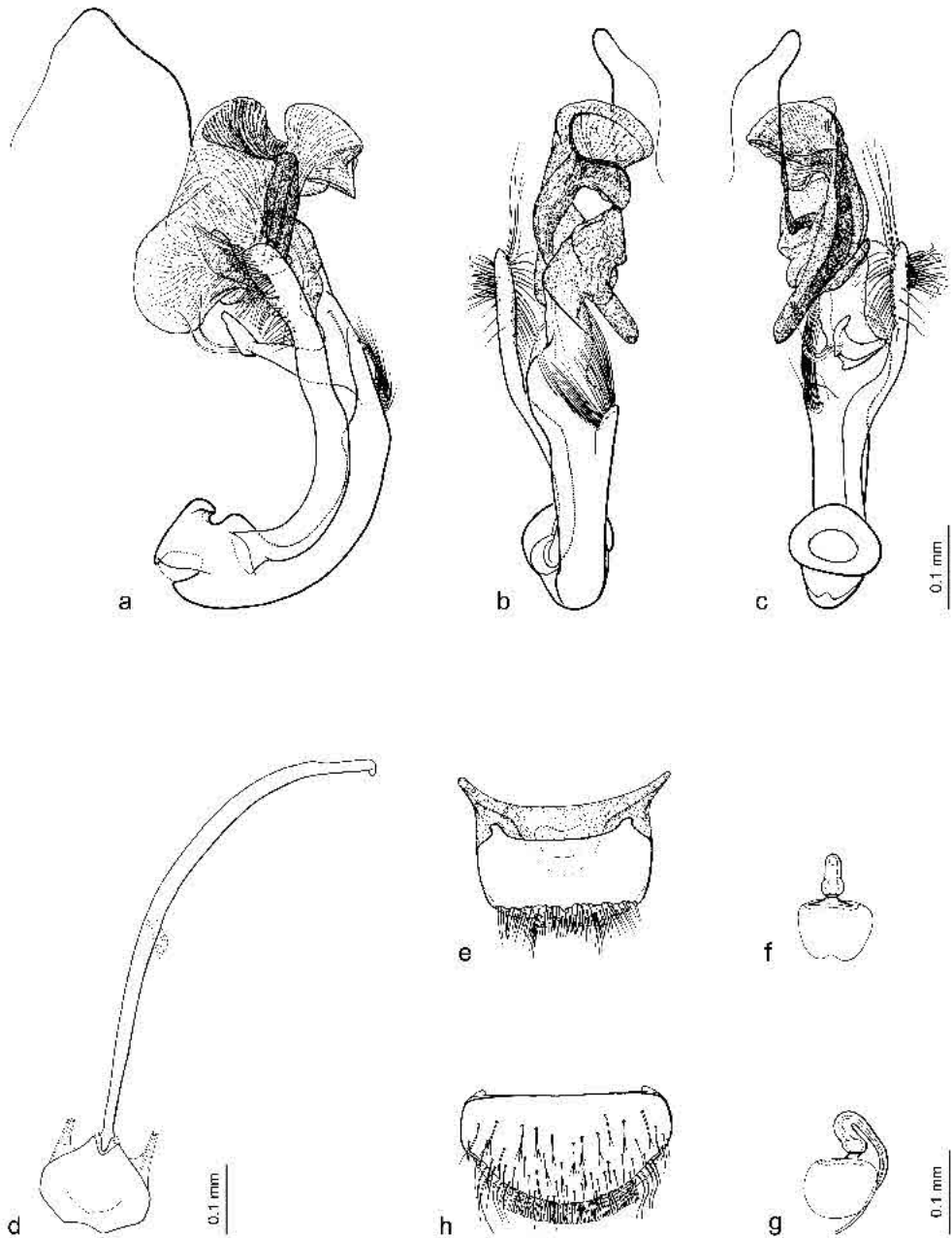


Fig. 22: *Hydraena* (s.str.) *christoferi*: a–c) aedeagus in lateral, dorsal and ventral view; d) male sternite X and spicula; e) gonocoxite; f–g) spermatheca; h) female tergite X.

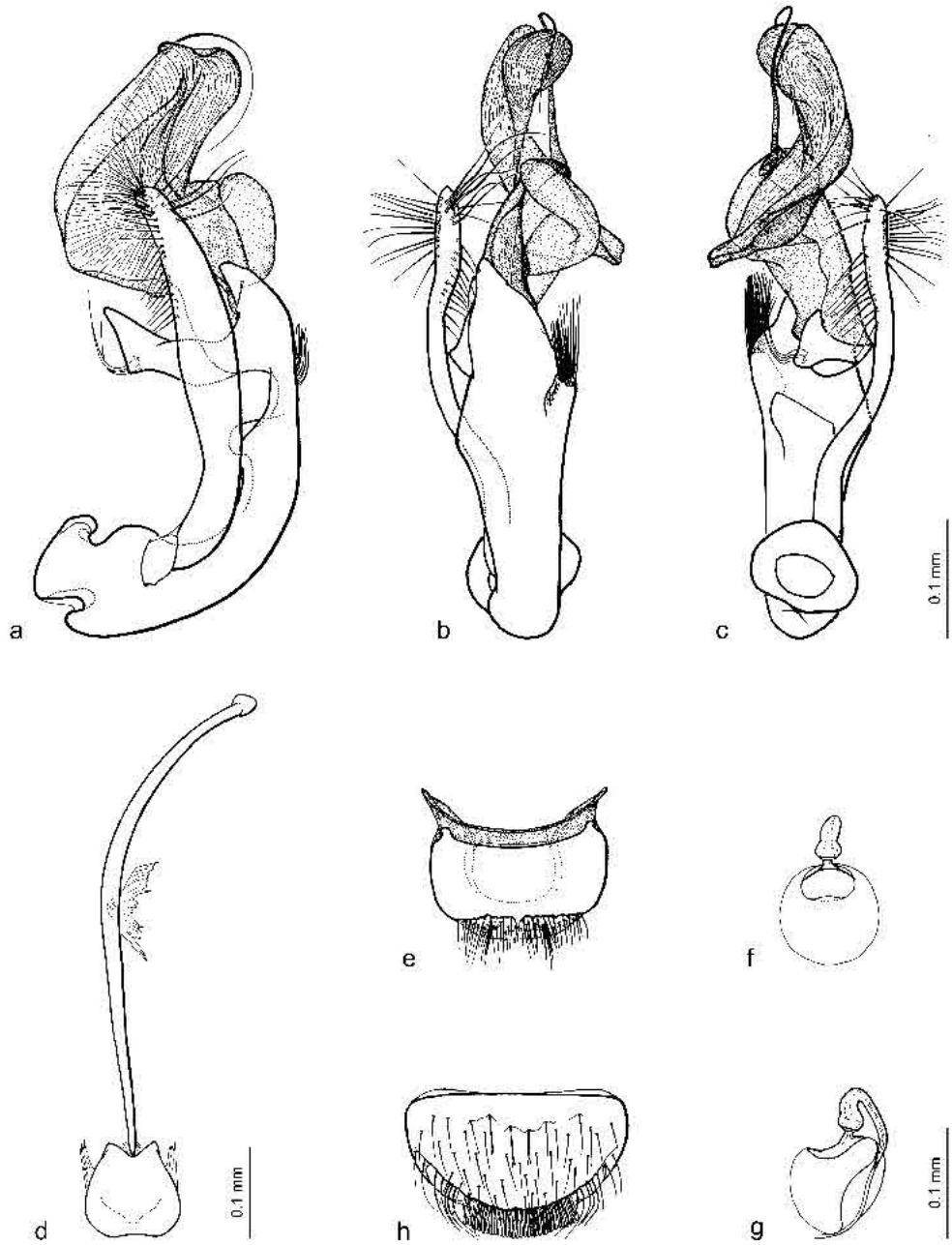


Fig. 23: *Hydraena* (s.str.) *wangmiao*: a–c) aedeagus in lateral, dorsal and ventral view; d) male sternite X and spicula; e) gonocoxite; f–g) spermatheca; h) female tergite X.

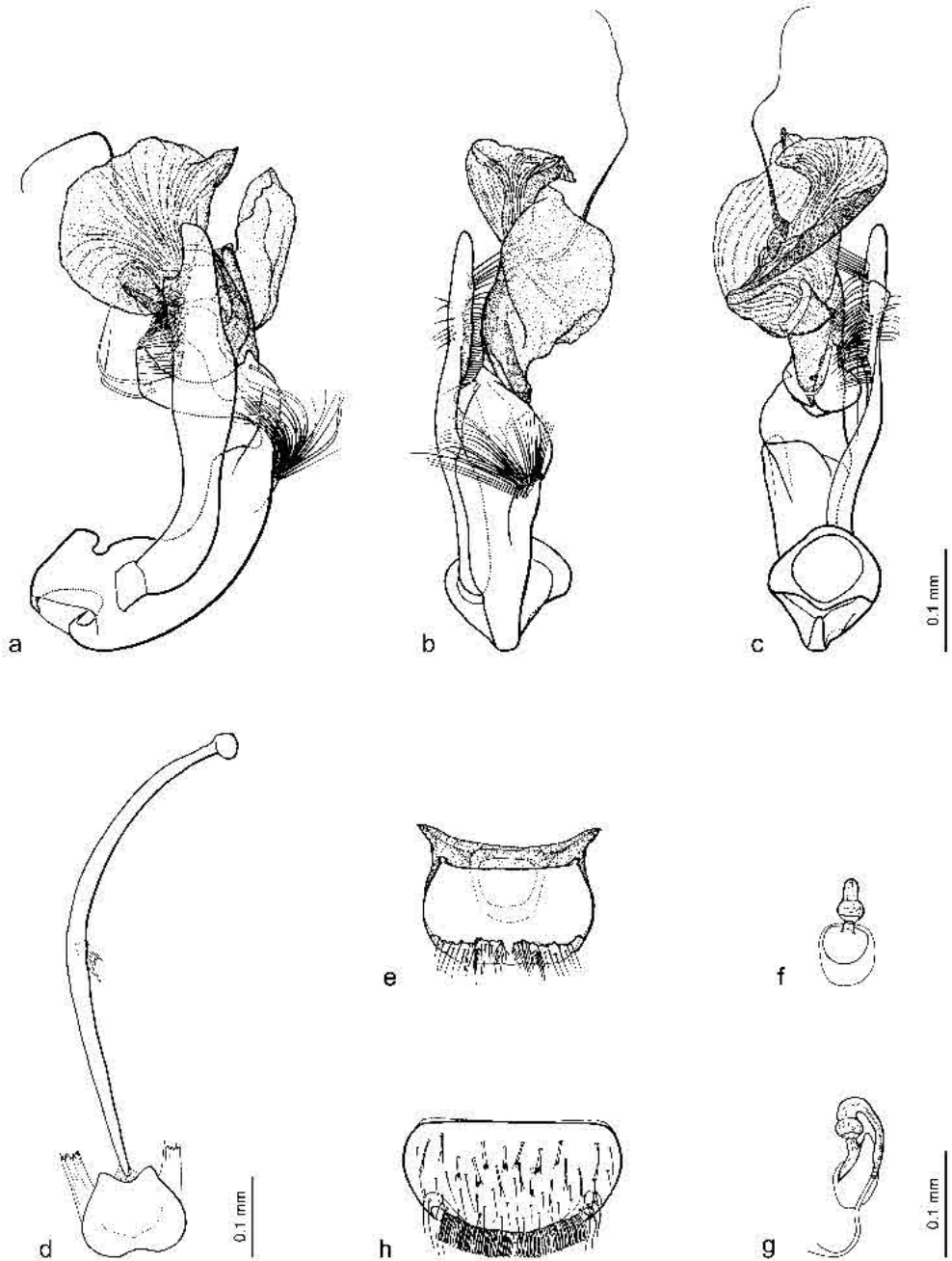


Fig. 24: *Hydraena* (s.str.) *guangxiensis*: a–c) aedeagus in lateral, dorsal and ventral view; d) male sternite X and spicula; e) gonocoxite; f–g) spermatheca; h) female tergite X.

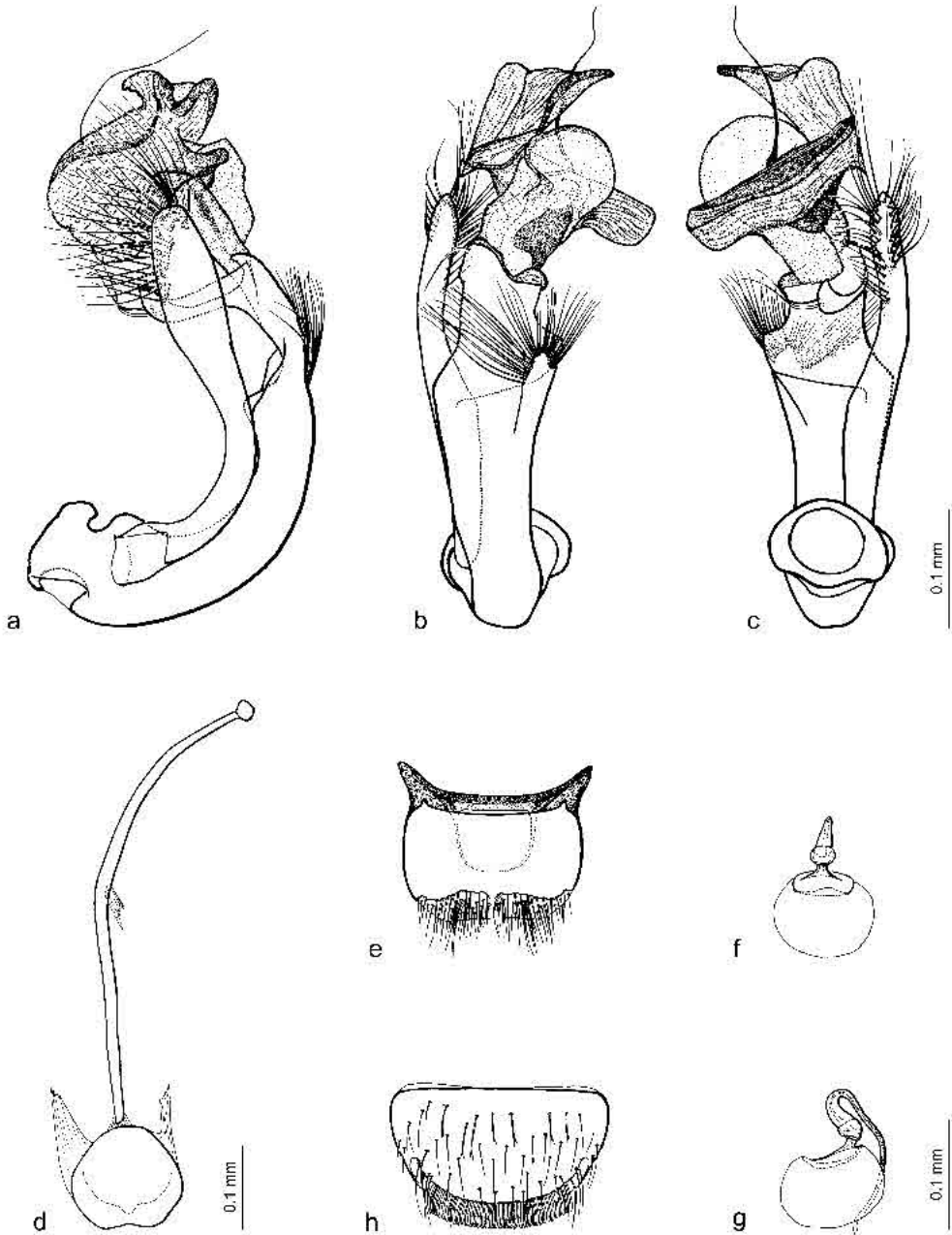


Fig. 25: *Hydraena* (s.str.) *draconisaurati*: a–c) aedeagus in lateral, dorsal and ventral view; d) male sternite X and spicula; e) gonocoxite; f–g) spermatheca; h) female tergite X.

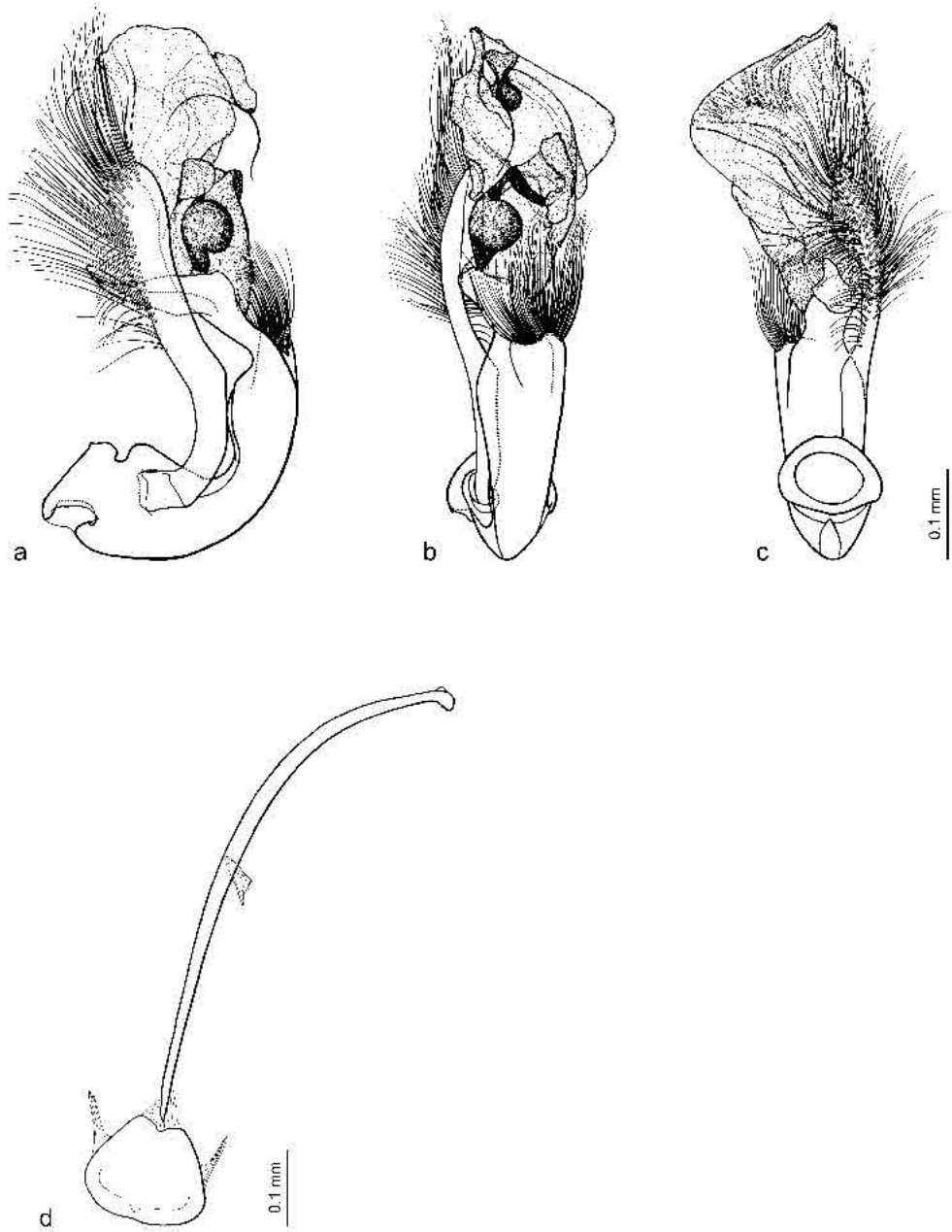


Fig. 26: *Hydraena (s.str.) stefani*: a–c) aedeagus in lateral, dorsal and ventral view; d) male sternite X and spicula.

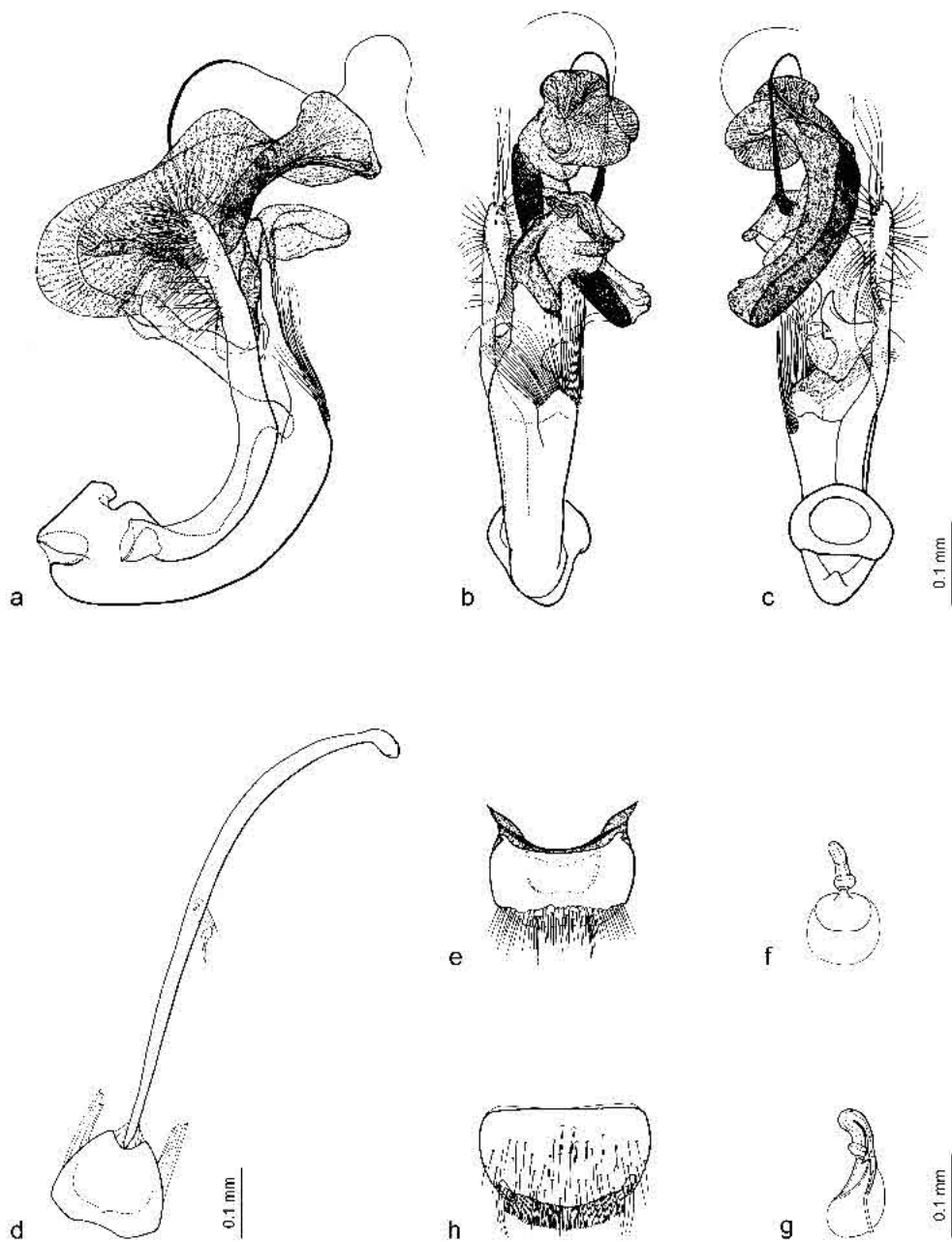


Fig. 27: *Hydraena* (s.str.) *guilin*: a–c) aedeagus in lateral, dorsal and ventral view; d) male sternite X and spicula; e) gonocoxite; f–g) spermatheca; h) female tergite X.

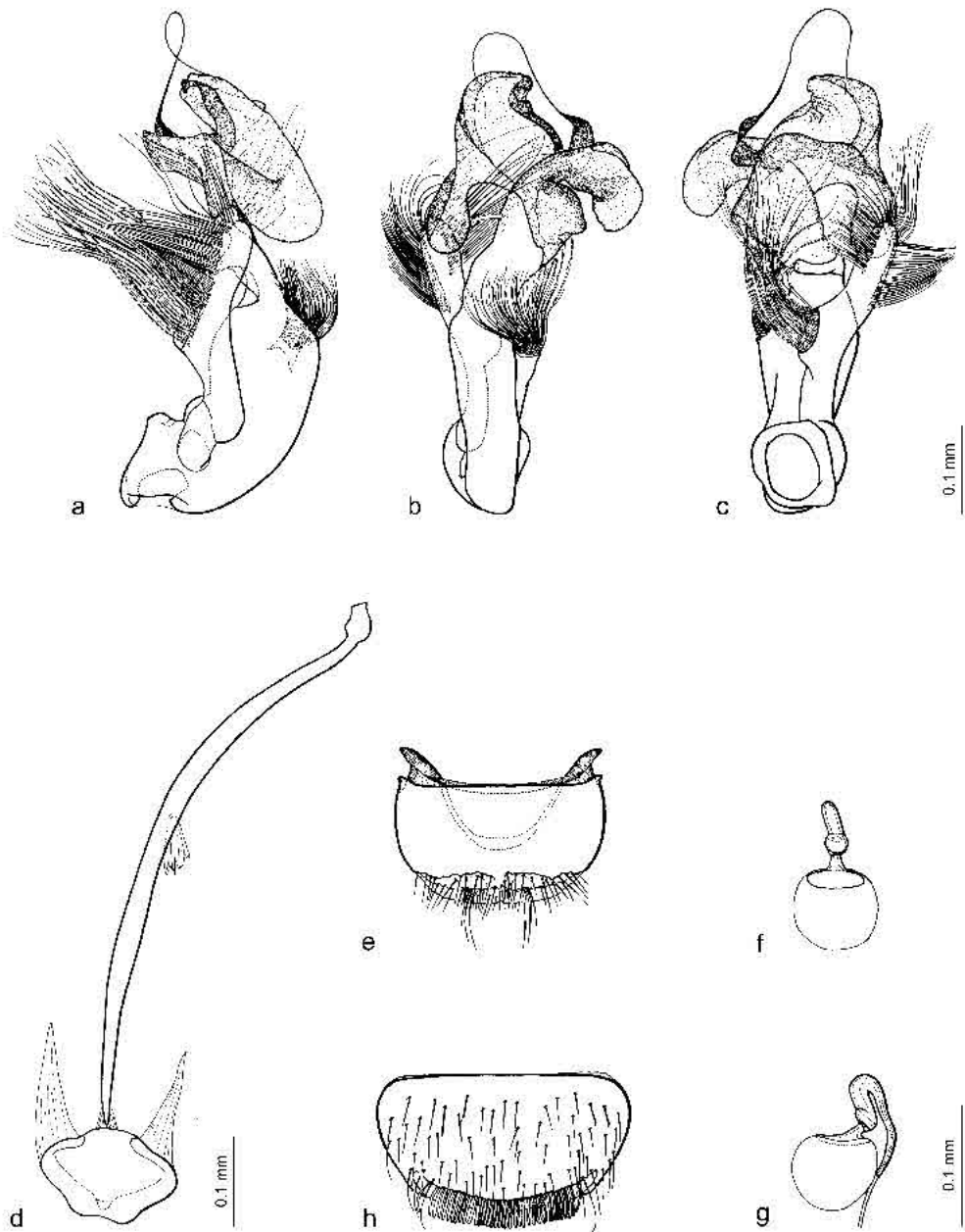


Fig. 28: *Hydraena* (s.str.) *huangshanensis*: a–c) aedeagus in lateral, dorsal and ventral view; d) male sternite X and spicula; e) gonocoxite; f–g) spermatheca; h) female tergite X.

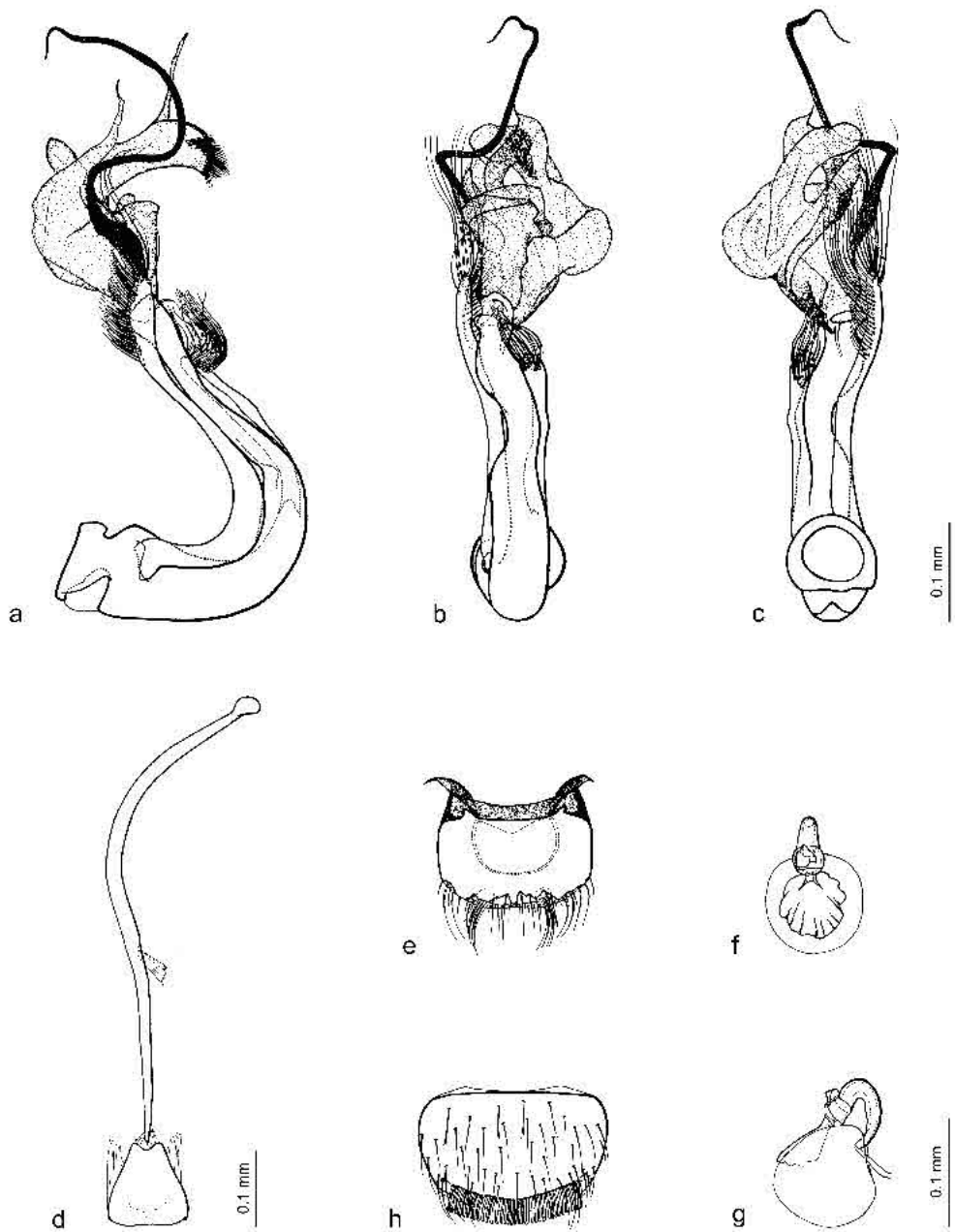


Fig. 29: *Hydraena* (s.str.) *huitongensis*: a–c) aedeagus in lateral, dorsal and ventral view; d) male sternite X and spicula; e) gonocoxite; f–g) spermatheca; h) female tergite X.

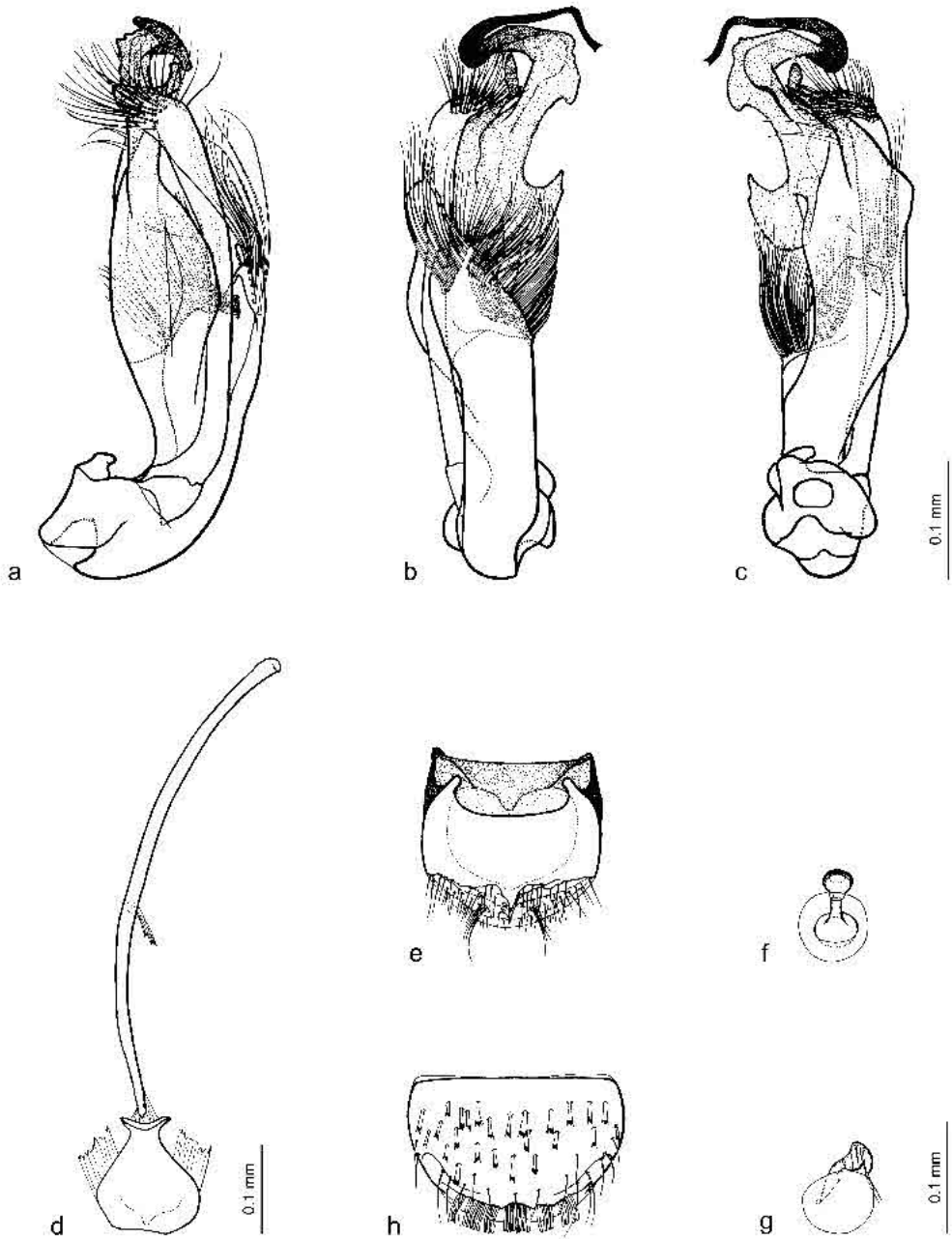


Fig. 30: *Hydraena* (s.str.) *jilanzhui*: a–c) aedeagus in lateral, dorsal and ventral view; d) male sternite X and spicula; e) gonocoxite; f–g) spermatheca; h) female tergite X.

Male sternite X and spicula (Fig. 30d): Sternite X subcordiform, base emarginate, basal angles produced laterad, posterior margin slightly emarginate; not firmly connected with spicula (sternite IX).

Female tergite X (Fig. 30h): transverse (length/width = 0.66); disc moderately densely covered with multifid setae, with few trichoid setae near apical margin; apical margin of disc conspicuously asymmetrical, sinuate and denticulate; apical hyaline margin excised medially; subapical fringe medially with densely set vermiform setae.

DIFFERENTIAL DIAGNOSIS: *Hydraena* (s.str.) *jilanzhui* can be distinguished from the other Chinese species of the subgenus by the subtruncate male elytra, by the tooth-like expansion of the male mesotibia, by the conspicuous base of male sternite X, by the aedeagus, and by the remarkable female tergite X (apical margin of disc conspicuously asymmetrical, sinuate and denticulate).

VARIABILITY: Middle of clypeus sometimes with superficially impressed meshes. Rows of punctures on elytra sometimes quite irregular.

HABITAT: For habitat description see above (material and methods) and JÄCH & JI (1995): CWBS localities 20 and 21.

DISTRIBUTION: This species is known only from two localities in northwestern Hunan.

ETYMOLOGY: Named for Prof. Lanzhu Ji (Head of Institute of Applied Ecology, Academia Sinica, Shenyang), in recognition of his invaluable contributions to the exploration of the Chinese water beetle fauna. The holotype and 60 paratypes of this species were collected by him.

Discussion

The 15 species described herein can tentatively be grouped in four lineages.

Hydraena (s.str.) *hansreuteri*, *H.* (s.str.) *aliciae*, and *H.* (s.str.) *undevigintioctogintasisyphos* are members of the *Hydraena armipalpis* species group, which includes also *H.* (s.str.) *armipalpis* and *H.* (s.str.) *masatakai* (see JÄCH & DÍAZ 2000; JÄCH & DÍAZ 2003). The intricate aedeagal morphology (incl. the curly parameral setae) and some of the secondary sexual characters (e.g. metafemoral setae) may be regarded as synapomorphies. Pronotum rather narrow in comparison to elytra, which are usually quite oval and wide (number of elytral striae variable). Meso- and metacoxae widely separated; mesoventral process very wide. Distinct metaventral plaques absent. Base of male sternite X acuminate. Aedeagal main piece with one or four subapical setae, one always on lateral projection (not very distinct in *H. masatakai*). Right paramere short and thick, with curly setae; both parameres not inserted at phallobase. Inner plate of gonocoxite not exposed basally. Distal portion of spermatheca tubular to tubular-discoidal; proximal portion not crescentic. Female tergite X with conspicuous apical notch.

Hydraena (s.str.) *martinschoepfi* is a remarkable species representing a separate lineage (*H. martinschoepfi* complex). Elytra oval (with seven, more or less regular rows of punctures between suture and shoulder). Metacoxae widely separated; metaventral plaques present. Male ventrite 5 produced apically, slightly asymmetrical. Base of male sternite X widely rounded. Aedeagus very intricately shaped. Right paramere not inserted at phallobase; left paramere almost completely fused with main piece. Base of female tergite X asymmetrical. Inner plate of gonocoxite exposed basally. Distal portion of spermatheca discoidal; proximal portion crescentic.

The third lineage (*H. lehmanni* complex) includes *Hydraena* (s.str.) *lehmanni*, *H.* (s.str.) *philippi*, *H.* (s.str.) *christoferi*, *H.* (s.str.) *wangmiaoi*, *H.* (s.str.) *guangxiensis*, *H.* (s.str.) *draconisaurati*, *H.* (s.str.) *stefani*, *H.* (s.str.) *guilin*, *H.* (s.str.) *huangshanensis*, and *H.* (s.str.) *huitongensis*. They are

united by their secondary sexual characters (of palpi and tibiae) and the morphology of the aedeagus (main piece with three subapical setae, two on ventral projection; right paramere inserted at phallobase; left paramere more or less completely fused with main piece in most species, except *H. huitongensis*). Pronotum rather wide in comparison to elytra, which are more or less parallel-sided (usually with five or six rows of punctures between suture and shoulder). Base of male sternite X conspicuously excised, emarginate, or widely rounded. Inner plate of gonocoxite exposed basally. Distal portion of spermatheca discoidal; proximal portion tubular, strongly curved, often almost crescentic. Externally, some members of this complex resemble the “Haenydra lineage”, mainly because of similarities in the elytral striation.

Hydraena (s.str.) *jilanzhui* (*H. jilanzhui* complex) differs from the species of the *H. lehmanni* complex mainly in the following characters: secondary sexual dimorphism (e.g. mesotibia, truncate male elytra). Body appendages paler. Base of male sternite X emarginate, basal angles produced laterad. Aedeagal main piece without subapical projection, with three setae (two ventral subapical and one dorsal). Distal portion of spermatheca tubular-discoidal; proximal portion typically crescentic. Female tergite X: apical margin of disc conspicuously asymmetrical, sinuate and denticulate; apical hyaline margin excised medially.

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