

New yellow-legged *Hybos* from Nanling, Guangdong, China (Diptera, Empidoidea, Hybotidae)

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New yellow-legged *Hybos* from Nanling, Guangdong, China (Diptera, Empidoidea, Hybotidae). - Five species of the genus *Hybos* with yellow legs are reported from the Nanling National Nature Reserve, Guangdong province. The following 3 species are described and illustrated: *Hybos ruyuanensis* sp. n., *H. trispinatus* sp. n., and *H. wangae* sp. n. They are compared with morphologically similar species.

Keywords: Diptera - Hybotidae - *Hybos* - new species - Nanling-Guangdong

INTRODUCTION

Hybos Meigen is a cosmopolitean genus belonging to the subfamily Hybotinae of the family Hybotidae. It is characterized by the following features: anal cell longer than basal cell, Rs rather short, R4+5 and M1 divergent apically and basal cells separated by distinct vein M1+2 (Chvála, 1983). The Oriental Region is the most diverse with 37 described species up to the mid eighties (Smith, 1975) and only 9 species were known from the Palaearctic region (Chvála & Kovalev, 1989) prior to the extensive studies of the Chinese fauna which started some 20 years ago. Currently 85 species are known to occur in China, most of which have black legs. They have been mainly described by Yang & Yang (1986, 1987, 1988a, b, 1989, 1991, 1995a, b), Saigusa & Yang (2002), and Yang *et al.* (2002). A comprehensive revision of the present knowledge of the genus was recently published by Yang & Yang (2005). Other major references dealing with *Hybos* in the Old World are Brunetti (1920), Frey (1953), Smith (1965), Saigusa (1963, 1965), and Chvála (1983).

Guangdong with a subtropical and tropical climate is situated in southern China and the fauna belongs to the Oriental realm. Before 2003, no studies on the empidoid fauna were available. A short survey in 2003, as part of a co-operation between China

Agricultural University (Beijing), South China Agricultural University (Guangzhou) and the Royal Belgian Institute of Natural Sciences (Brussels) revealed the presence of numerous new species (Daugeron *et al.*, 2003; Grootaert *et al.*, 2003; Zhang *et al.*, 2003). Nanling National Nature Reserve (23°20'N, 115°23'E) situated in North of Guangdong, is one of the largest Nature Reserves in South China and famous for its biodiversity. In the present paper, 5 species of the genus *Hybos* with yellow legs are reported, based on the material collected by Mr Xingyue Liu and Ms Shuwen An by sweeping in July 2003. Three species are described as new to science. A key is given to separate the five closely related species to facilitate their identification.

MATERIAL AND METHODS

The specimens on which this study is based are deposited in the following collections:

CAU Insect collection of China Agricultural University, Beijing, China.

MHNG Muséum d'histoire naturelle, Genève, Switzerland.

Basic terminology follows McAlpine (1981) and Steyskal & Knutson (1981). The following abbreviations are used: acr = acrostichal, ad = anterodorsal, av = anteroventral, dc = dorsocentral, oc = ocellar, npl = notopleural, pd = posterodorsal, pprn = postpronotal, presc = prescutellar, psa = postalar, pv = posteroventral.

KEY TO SPECIES OF *HYBOS* FROM NANLING (MALES ONLY)

- 1 Hind femur with 2-3 rows of ventral spines; hind tibia with 1-2 dorsal bristles at middle; scutellum black; femora entirely yellow or with dark apex 2
- 1* Hind femur with one row of ventral spines; hind tibia without dorsal bristles at middle; femora and scutellum yellow *trispinatus* sp. n.
- 2 Hind tibia with 1 ad and 1 pd at middle; hind femur entirely yellow or with dark apex 3
- 2* Hind tibia with 1 dorsal bristle at middle; mid tibia with 2 dorsal bristles on basal half; hind femur dark brown apically ... *orientalis* Yang & Yang, 1986
- 3 Mid tibia with 2 bristles in dorsal to anterodorsal position on basal half; hind femur with brown apex 4
- 3* Mid tibia with 1 dorsal bristle on basal half; all femora entirely yellow *ruyuanensis* sp. n.
- 4 Only hind femur dark brown apically *gutianshanus* Yang & Yang, 1995
- 4* All femora brown or dark brown apically *wangae* sp. n.

TAXONOMIC PART

Hybos gutianshanus Yang & Yang, 1995

Hybos gutianshanus Yang & Yang, 1995c: 237.

Type locality: Zhejiang (Gutianshan Mountain).

MATERIAL: 2 males, Guangdong: Ruyuan, Nanling National Nature Reserve, 23. VII. 2003, Xingyue Liu & Shuwen An (CAU); 1 male, Guangdong: Ruyuan, Nanling National Nature Reserve, 24. VII. 2003, Xingyue Liu (MNHG).

DIAGNOSIS: Femora yellow, but hind femur dark brown apically; the latter with two rows of ventral spines. Mid tibia with 2 dorsal bristles on basal half; hind tibia with 2 dorsal bristles at middle.

DISTRIBUTION: China (Guangdong, Zhejiang).

Hybos orientalis Yang & Yang, 1986

Hybos orientalis Yang & Yang, 1986: 82.

Type locality: Guangxi (Longsheng), Fujian (Jianyang).

MATERIAL: 2 males, Guangdong: Ruyuan, Nanling National Nature Reserve, 25. VII. 2003, Xingyue Liu & Shuwen An (CAU & MNHG).

DIAGNOSIS: Femora yellow, but hind femur dark brown apically, the latter with two rows of ventral spines. Mid tibia with 2 dorsal bristles on basal half; hind tibia with 1 dorsal bristle at middle.

DISTRIBUTION: China (Guangdong, Guangxi, Fujian, Henan).

Hybos ruyuanensis sp. n.

Figs 1-5

MATERIAL: Holotype male, Guangdong: Ruyuan, Nanling National Nature Reserve, 23. VII. 2003, Xingyue Liu (CAU). Paratypes 10 males, 3 females, same data as holotype (CAU & MNHG); 17 males, 8 females, Guangdong: Ruyuan, Nanling National Nature Reserve, 25. VII. 2003, Xingyue Liu (CAU).

ETYMOLOGY: The species is named after the type locality Ruyuan.

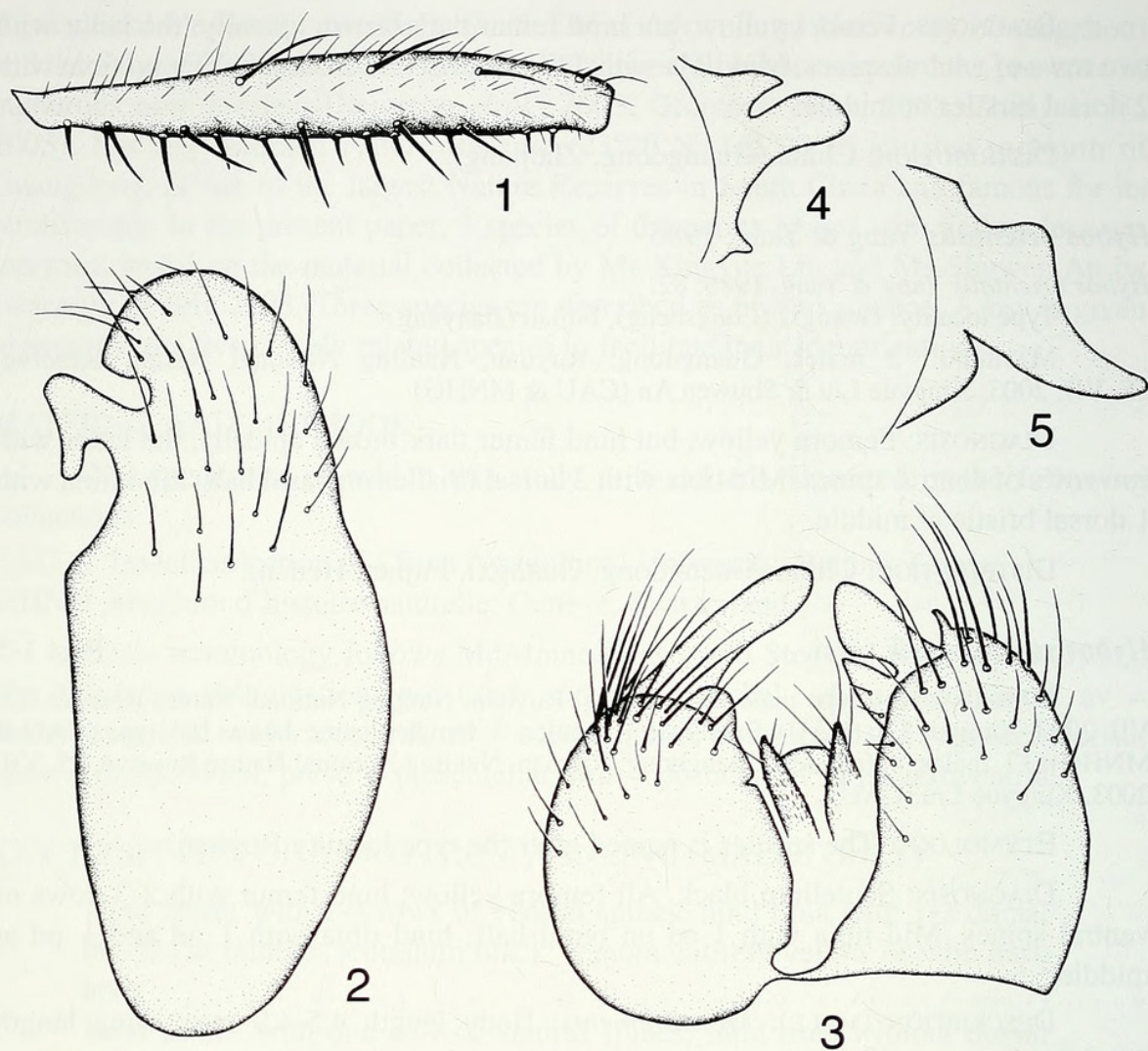
DIAGNOSIS: Scutellum black. All femora yellow; hind femur with 2-3 rows of ventral spines. Mid tibia with 1 ad on basal half; hind tibia with 1 ad and 1 pd at middle.

DESCRIPTION (MALE): *Measurements*: Body length 4.5-4.9 mm, wing length 4.0-4.2 mm.

Head: Black, pale grey microtrichose. Eyes brown but enlarged upper facets pale brownish yellow, contiguous on frons for a long distance which is 3.0 times the length of the 1st flagellomere. Bristles on head black, hairs mostly pale; ocellar tubercle weak, with 2 very short oc and without posterior hairs. Antenna black; scape without hairs; pedicel with a circle of subapical hairs; 1st flagellomere without dorsal hairs; arista black, short pubescent except apical 1/4 thin and bare. Proboscis brown; palpus blackish with 2 ventral hairs.

Thorax: Black (including scutellum), pale grey microtrichose. Bristles on thorax black, hairs mostly pale; postpronotal lobe with 3-4 hairs (posterior one slightly longer); pprn absent, 2 npl (anterior npl slightly shorter), acr in about 8 more or less regular rows, 1 long posterior dc and 6-8 hairs anteriad, 1 long presc, 1 long psa; scutellum with 6 pale marginal hairs and 2 very long black subapical bristles.

Legs: Entirely yellow including coxae, only tarsomeres 3-5 dark brown; bristles black and hairs mostly pale except coxae and trochanters with pale bristles and hairs. Fore femur as wide as mid femur, with one row of hair-like short av and slightly longer pv; mid femur with several ad on basal half and one row of hair-like av and pv; hind femur (Fig. 1) twice as wide as mid femur, with 4 anterior bristles, and with 2-3 rows of ventral spines (spines of av row rather long). Fore tibia with 1 ad at middle, apically



FIGS 1-5

Hybos ruyuanensis sp. n. (male). (1) hind femur anterior view. (2) hypandrium, ventral view. (3) genitalia, dorsal view. (4) left surstylus. (5) right surstylus.

with 1 long ad and 1 short pv; mid tibia with 1 very long ad and 1 very long av in basal half, 1 preapical ad, and 1 preapical posterior bristle, apically with 4 bristles (of which 1 pv is very long); hind tibia with 1 very long strong ad and 1 slightly shorter pd on median portion, and 1 preapical anterior bristle, apically with 1 av and 1 pd. Fore tarsomere 1 with 1 long ventral bristle at extreme base; mid tarsomere 1 with 1 long av and 1 short pv at extreme base and 1 pv at middle, apically with 5 bristles; hind tarsomere 1 with short, strong ventral bristle.

Wing: Slightly tinged greyish; veins dark brown; stigma about as long as one third of cell R1 and brown. Squama dark yellow, bordered with pale hairs. Halter brownish yellow.

Abdomen: Nearly straight or slightly curved downward, black, grey microtrichose. Hairs on abdomen mostly pale. Male genitalia (Figs 2-5): left epandrial lobe rather wide in dorsal view, left surstylus short and broad with three short apical processes; right epandrial lobe rather wide in lateral view, right surstylus short and

broad with oblique and curved tip; hypandrium much longer than wide, obtuse apically, and with apico-lateral incision bearing a hook-like curved process.

FEMALE: Body length 3.7-4.3 mm, wing length 3.9-4.0 mm. Similar to male, but hind femur with only 1 strong preapical bristle (rarely with a weak additional bristle), and hind tibia with only 1 dorsal bristle at middle.

DISTRIBUTION: China (Guangdong).

REMARKS: The new species is similar to *Hybos aurifer* Saigusa, 1963, from Japan in having yellow legs with pale hairs and hind femur with 2-3 rows of ventral spines, but can be easily separated from the latter by having the mid tibia with only 1 dorsal bristle on basal half. In *H. aurifer*, the mid tibia has 2 dorsal bristles. The two species differ also in details of structure and chaetotaxy of male terminalia.

***Hybos trispinatus* sp. n.**

Figs 6-10

MATERIAL: Holotype male, Guangdong: Ruyuan, Nanling National Nature Reserve, 24. VII. 2003, Xingyue Liu (CAU). Paratype 1 male, same data, 25. VII. 2003 (MNHG).

ETYMOLOGY: The species is named after the right epandrial lobe with 3 long strong apical spines.

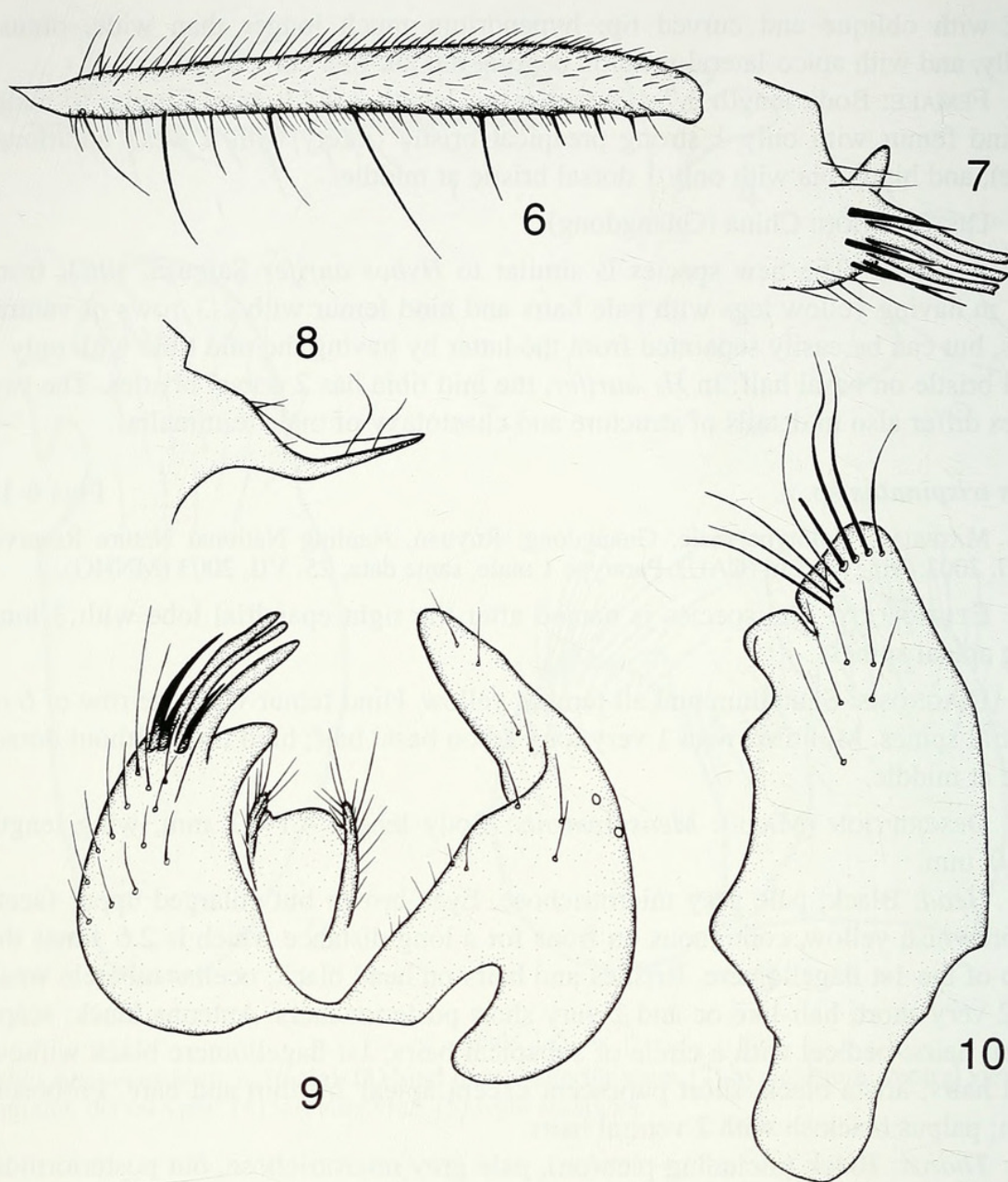
DIAGNOSIS: Scutellum and all femora yellow. Hind femur with one row of 6 or 8 ventral spines. Mid tibia with 1 very long ad on basal half; hind tibia without dorsal bristle at middle.

DESCRIPTION (MALE): *Measurements:* Body length 4.1-4.2 mm, wing length 3.7-4.0 mm.

Head: Black, pale grey microtrichose. Eyes brown but enlarged upper facets pale brownish yellow, contiguous on frons for a long distance which is 2.6 times the length of the 1st flagellomere. Bristles and hairs on head black; ocellar tubercle weak with 2 very short, hair-like oc and 2 very short posterior hairs. Antenna black; scape without hairs; pedicel with a circle of subapical hairs; 1st flagellomere black without dorsal hairs; arista black, short pubescent except apical 2/5 thin and bare. Proboscis brown; palpus blackish with 2 ventral hairs.

Thorax: Black (including pleuron), pale grey microtrichose, but posteriormost part of postpronotum, postalar callus and scutellum yellow. Colour of bristles on thorax varying from blackish to pale brown depending on illumination, hairs pale; 1 short, rather pale pprn, 2 npl (anterior npl short, about two third as long as posterior npl), acr in about 6 more or less regular rows, 1 long posterior dc and 8 hairs anteriad, 1 slightly shorter presc, 1 long psa; scutellum with 8 pale marginal hairs and 2 very long blackish subapical bristles.

Legs: Entirely yellow including coxae, only tarsomeres 3-5 darker brown; bristles and hairs black except coxae and trochanters with pale bristles and hairs, femora with pale ventral hairs. Fore femur 1.2 times as wide as mid femur, with one row of short hair-like av and longer hair-like pv which are about as long as diameter of femur; mid femur with 2-3 short ad at base (shorter than diameter of femur) and one row of short hair-like av and pv; hind femur (Fig. 6) 1.8 times as wide as mid femur, without preapical bristles, and with only one full row of 6 or 8 av spines; posteroventrally at apex with 1-2 stout, short black spines. Fore tibia with 1 dorsal bristle at middle,



FIGS 6-10

Hybos trispinatus sp. n. (male). (6) hind femur anterior view. (7) right surstylus. (8) left surstylus. (9) genitalia, dorsal view. (10) hypandrium, ventral view.

apically with 1 long ad, 1 av and 1 pv; mid tibia with 1 very long ad in basal third and 1 very long av at middle, apically with 4 bristles (of which 1 av is very long); hind tibia apically with 1 av and 1 pd. Fore tarsomere 1 with strong ventral bristle as well as 1 strong pv at extreme base; mid tarsomere 1 with 1 strong pv in basal third; hind tarsomere 1 with strong ventral bristle.

Wing: Slightly tinged greyish; veins dark brown; stigma as long as one third of cell R1 and dark brown. Squama dark yellow, bordered with pale hairs. Halter brownish yellow.

Abdomen: Slightly curved downward, black, grey microtrichose. Hairs on abdomen mostly pale. Male genitalia (Figs 7-10): left epandrial lobe rather wide in

dorsal view, left surstylus long, finger-like, and flattened; right epandrial lobe rather wide in dorsal view, right surstylus with three long spine-like apical processes and 1 short finger-like lateral process; hypandrium much longer than wide, obtuse apically, and with very narrow apico-lateral incision.

FEMALE: Unknown.

DISTRIBUTION: China (Guangdong).

REMARKS: The new species is very similar to *Hybos flaviscutellum* Yang & Yang, 1986 in having a yellow scutellum and the mid tibia with 1 very long ad on basal half, but *H. trispinatus* can be easily separated from the latter by having the thoracic pleuron wholly black and hind femur with only one row of av spines. In *H. flaviscutellum*, the thoracic pleuron is dark brownish yellow with yellow lower half, and the hind femur has two entire rows of av and pv spines.

***Hybos wangae* sp. n.**

Figs 11-15

MATERIAL: Holotype male, Guangdong: Ruyuan, Nanling National Nature Reserve, 25. VII. 2003, Xingyue Liu (CAU). Paratype 1 male, same data as holope (MNHG).

ETYMOLOGY: The species is named after Mrs. Mengqing Wang.

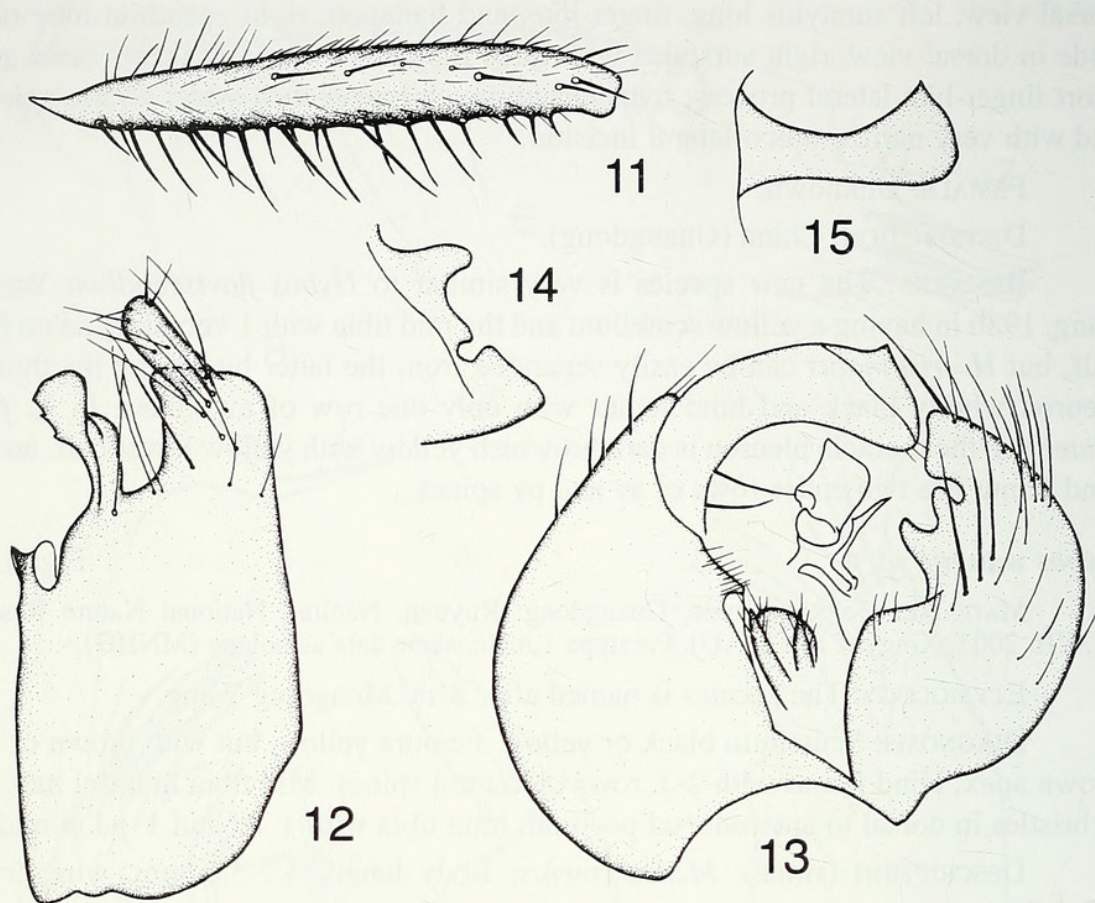
DIAGNOSIS: Scutellum black or yellow. Femora yellow, but with brown or dark brown apex. Hind femur with 2-3 rows of ventral spines. Mid tibia in basal half with 2 bristles in dorsal to anterodorsal position; hind tibia with 1 ad and 1 pd at middle.

DESCRIPTION (MALE): *Measurements*: Body length 4.7-5.0 mm, wing length 4.0-4.2 mm.

Head: Black, pale grey microtrichose. Eyes dark brown but enlarged upper facets pale yellow, contiguous on frons for a long distance which is 2.2 times the length of the 1st flagellomere. Bristles and hairs on head black; ocellar tubercle weak, with 2 very short oc hair-like and 2 very short posterior hairs. Antenna black; scape without hairs; pedicel with a circle of subapical hairs; 1st flagellomere without dorsal hairs; arista black, short pubescent except apical 1/3 thin and bare. Proboscis brown; palpus blackish with 2 ventral hairs.

Thorax: Black, pale grey microtrichose, scutellum black or yellow. Bristles and hairs on thorax black; postpronotal lobe without bristles, but with 4 hairs (posterior one slightly longer); 2 npl (anterior npl slightly shorter), acr in about 4 more or less regular rows, 1 long posterior dc and 8 hairs anteriad, 1 long presc, 1 long psa; scutellum with 8 pale marginal hairs and 2 very long black subapical bristles.

Legs: Mainly yellow, but all femora with brown apex; coxae entirely yellow; tarsomeres 3-5 dark brown; bristles and hairs black except coxae and trochanters with mainly pale bristles and hairs. Fore femur 1.1 times as wide as mid femur, with one row of hair-like short av and long pv; mid femur with several ad on basal half and one row of hair-like av and pv; hind femur (Fig. 11) 1.9 times as wide as mid femur, with 4-5 anterior bristles, and with 2-3 rows of long ventral spines. Fore tibia with 1 ad at middle, apically with 1 very long ad and 1 short pv; mid tibia in basal half with 2 very long bristles in dorsal to anterodorsal position and 1 very long av, 1 preapical ad and 1 preapical posterior bristle, apically with 5 bristles (of which 1 av is long); hind tibia in middle with 2 more or less dorsally inserted bristles (the lower one slightly more



FIGS 11-15

Hybos wangae sp. n. (male). (11) hind femur anterior view. (12) hypandrium, ventral view. (13) genitalia, dorsal view. (14) left surstylus. (15) right surstylus.

posteriorly directed), apically with 1 av, 1 preapical anterior bristle and 1 pd. Fore tarsomere 1 with 1 long ventral bristle at extreme base, apically with 1 long ad and 1 very short ventral bristle; mid tarsomere 1 with 1 short av and 1 long ventral bristle at extreme base and 1 long pv at middle, apically with 1 long dorsal bristle and 1 long pv; hind tarsomere 1 with short, but strong ventral bristle.

Wing: Slightly tinged greyish; veins dark brown; stigma nearly half as long as cell R1 and brown, which reaches the tip of R2+3. Squama dark yellow, bordered with pale hairs. Halter brown.

Abdomen: Slightly curved downward, black, grey microtrichose. Hairs on abdomen mostly pale. Male genitalia (Figs 12-15): left epandrial lobe slightly narrow in dorsal view, left surstylus short and broad with three short apical processes; right epandrial lobe rather wide, right surstylus long, thick and strongly curved inward; hypandrium distinctly longer than wide, basally rather wide, with apico-lateral incision bearing 1 ridge-like process.

FEMALE: Unknown.

DISTRIBUTION: China (Guangdong).

REMARKS: The new species is very similar to *Hybos ruyuanensis* sp. nov. in having the hind tibia at middle with 2 more or less dorsal bristles, but can be easily

separated from the latter by the hind femur with brown apex and the mid tibia with 2 dorsal to anterodorsal bristles in basal half. In *H. ruyuanensis*, the hind femur is entirely yellow, and the mid tibia has only 1 ad in basal half.

CONCLUSIONS

Nanling National Nature Reserve is situated in the Guangdong Province of Southern China which belongs to the Oriental realm with a subtropical and tropical climate. The species of *Hybos* usually have black legs. But it is very interesting that not less than 5 species with yellow legs are found together in this area based on the material collected in July. The two already described species are distributed also in Central China. Concerning the three new species, it seems that *Hybos trispinatus* is a sister species of *Hybos flaviscutellum* Yang & Yang, 1986, from South China, and the other two new species, *Hybos ruyuanensis* and *Hybos wangae*, are closely related and have some similarities with *Hybos aurifer* Saigusa, 1963, from Japan.

ACKNOWLEDGEMENTS

We are much indebted to Prof. Zaifu Xu (South China Agricultural University, Guangzhou) for his help during the survey to Guangdong, as well as to Mrs Mengqing Wang and Mr Xingyue Liu (China Agricultural University, Beijing) for their help in many ways. The research was funded by the National Natural Science Foundation of China (No. 30070100 and No. 30225009).

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Yang, Ding, Merz, B, and Grootaert, Patrick. 2006. "New yellow-legged Hybos from Nanling, Guangdong, China (Diptera, Empidoidea, Hybotidae)." *Revue suisse de zoologie* 113, 797–806. <https://doi.org/10.5962/bhl.part.80376>.

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