

Two new species in the genus *Hybos* Meigen (Diptera: Empididae) from Northwest China

Shuangmei DING¹, Ruie LV^{2①}, Hongjian WANG³, Ding YANG^{1①}

1. Department of Entomology, China Agricultural University, Beijing 100193, China

2. Longnan City Academy of Economic Forestry, Longnan, Gansu 746000, China

3. Forestry Sci-Tech Extension Station of Gansu Province, Lanzhou, Gansu 730046, China

Abstract: Seventeen species of the genus *Hybos* Meigen have been previously known to occur in Northwest China. Two more species of *Hybos* are added to this region: *Hybos diebuensis* sp. nov. and *Hybos triseta* sp. nov. An updated key to species of *Hybos* from Northwest China is presented.

Key words: Brachycera; dance flies; taxonomy; key

中国西北地区驼舞虻属二新种（双翅目：舞虻科）

丁双玫¹, 吕瑞娥^{2①}, 王洪建³, 杨定^{1①}

1. 中国农业大学昆虫学系, 北京 100193; 2. 甘肃陇南市经济林研究院, 甘肃 陇南 746000; 3. 甘肃省林业科学技术推广总站, 甘肃 兰州 730046

摘要: 中国西北地区驼舞虻属以前已知 17 种。本文又报道该地区 2 种: 迭部驼舞虻, 新种 *Hybos diebuensis* sp. nov. 和三鬃驼舞虻 *Hybos triseta* sp. nov., 并提供中国西北地区驼舞虻属分种检索表。

关键词: 短角亚目; 舞虻; 分类; 检索表

Introduction

Adults of the genus *Hybos* Meigen usually occur in somewhat dry mountainous habitats. The genus is characterized by the following features: eyes narrowly but distinctly separated on face, usually with upper facets enlarged. Proboscis strong, spinose, directed forward; labellum constricted for piercing, without pseudotracheae; palpus slender, nearly as long as proboscis. Rs rather short (nearly as long as distance between humeral crossvein and extreme base of Rs); anal cell longer than cell bm; anal cell produced posteroapically, inner angle formed between CuA2 and A1 strongly acute with CuA2 usually distinctly curved; basal portion of M (separating basal cells) distinct. Legs strongly bristled. Hind femur distinctly to strongly swollen, with spinose ventral setae (Chvála 1983; Yang & Yang 2004). It is distributed worldwide with 217 known species, of which 14 species are distributed in the Palearctic Region and 181 species in the Oriental Region (Yang *et al.* 2007; Yang 2008; Li & Yang 2009; Shi *et al.* 2009; Huo *et al.* 2010; Jiang *et al.* 2011; Yang & Li 2011; Plant 2013; Shamshev *et al.* 2013; Li *et al.* 2014; Shamshev *et al.* 2015). Seventeen species of the genus *Hybos* Meigen were previously known to occur in Northwest China (Li *et al.* 2014). In this paper, two new

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① Corresponding authors, E-mails: 994086320@qq.com; dyangcau@126.com

species are added to the fauna of Northwest China. An updated key to the species of *Hybos* from Northwest China is provided.

Material and methods

The type specimens are deposited in the Entomological Museum of China Agricultural University (CAU), Beijing. Terms used for adult structures and male genitalia follow those of Cumming & Wood (2009). The following abbreviations are used for bristles: acr—acrostichal, ad—anterodorsal, av—anteroventral, dc—dorsocentral, npl—notopleural, oc—ocellar, pd—posterodorsal, prsc—prescutellar, psa—postalar, pv—posteroventral, sa—supraalar, sc—scutellar.

Taxonomy

Key to species of *Hybos* from Northwest China (modified from Li, Wang & Yang, 2014)

1. Thorax black; legs not entirely yellowish..... 2
- Thorax brownish yellow with pleuron nearly yellow; legs entirely yellowish..... *H. lii* Yang & Yang
2. R₄₊₅ and M₁ parallel..... 3
- R₄₊₅ and M₁ not parallel..... 4
3. Legs partly dark brownish yellow; first flagellomere without dorsal setulae; hypandrium trifurcated.....
- *H. furcatus* Yang & Yang
- Legs entirely black; first flagellomere with 2 dorsal setulae; hypandrium not trifurcated.....
- *H. oncus* Yang & Yang
4. Legs partly or mostly yellow or brownish yellow..... 5
- Legs blackish to black, at most tarsi partly yellow..... 10
- 5 All coxae brownish yellow or yellow..... 6
- All coxae entirely black..... 9
6. Arista pubescent; hind tibia without dorsal seta or with 2 dorsal setae at middle; pterostigma present..... 7
- Arista bare; hind tibia with 1 dorsal seta at middle; pterostigma indistinct..... *H. psilus* Yang & Yang
7. Hind tibia without dorsal seta at middle..... 8
- Hind tibia with 2 dorsal setae at middle..... *H. pallidus* Yang & Yang
8. Hind femur entirely black..... *H. liupanshanus* Li & Yang
- Hind femur yellow, but widely black at middle..... *H. diebuensis* **sp. nov.**
9. Hind femur with only one row of short ventral setae *H. digitiformis* Yang & Yang
- Hind femur with three rows of ventral setae..... *H. flavitibialis* Li, Wang & Yang
10. Hind femur distinctly thickened with two or three rows of ventral setae..... 11
- Hind femur weakly thickened with only one row of ventral setae..... *H. tibetanus* Yang & Yang
11. Hind femur with two rows of ventral setae; hypandrium not as below..... 12
- Hind femur with three rows of ventral setae; hypandrium basally wide, apically acute.....
- *H. xii* Li, Wang & Yang
12. Antenna black; hypandrium not as below..... 13
- Antenna dark yellow; hypandrium much longer than wide, apically nearly acute..... *H. joneensis* Yang & Yang
13. Hind tibia without ad at middle; left or right surstylus with narrow apical incision..... 14
- Hind tibia with 1–2 ad at middle; both left and right surstyli with wide apical incision..... 18
14. First flagellomere not elongated, not longer than scape and pedicel combined..... 15

- First flagellomere much elongated, longer than scape and pedicel combined..... 17
- 15. Left surstylus with lateral process; hypandrium apically with only one incision..... 16
- Left surstylus without lateral process; hypandrium apically with two incisions.....
..... *H. projectus* Li, Wang & Yang
- 16. Hind coxa with 3 spinose anterior setae apically; right surstylus short and wide..... *H. grossipes* (Linnaeus)
- Hind coxa without spinose anterior setae; right surstylus long and narrow..... *H. wudanganus* Yang & Yang
- 17. Arista bare; left epandrial lamella much longer than right epandrial lamella.....
..... *H. elongatus* Li, Wang & Yang
- Arista pubescent; left epandrial lamella slightly longer than right epandrial lamella..... *H. triseta* **sp. nov.**
- 18. Hind tibia with 1 ad at middle; hypandrium apically with an irregular incision at middle.....
..... *H. qinlingensis* Li, Wang & Yang
- Hind tibia with 2 ad at middle; hypandrium apically with long finger-like lateral process.....
..... *H. hubeiensis* Yang & Yang

1. *Hybos diebuensis* **sp. nov.** (Figs. 1–4)

Diagnosis. Arista sparsely pubescent. Legs yellow except hind femur widely black at middle; tarsi brownish yellow with tarsomeres 3–5 blackish. R_{4+5} and M_1 distinctly divergent apically. Hypandrium apically narrowly furcated.

Male. Body length 4.3–4.7 mm, wing length 4.8–5.4 mm.

Head black with pale gray pollinosity. Eyes contiguous on frons, dark brown; upper facets not enlarged. Setulae and setae on head black; ocellar tubercle distinct, with 2 long oc. Antenna blackish; scape without setulae, pedicel with circlet of subapical setulae; first flagellomere weakly elongated, nearly as long as scape and pedicel combined, without dorsal setula; arista much longer than basal 3 antennal segments, sparsely pubescent except apical 1/4 or thin and bare. Proboscis nearly as long as head, brownish. Palpus black, with 4–5 ventral setulae mostly short.

Thorax black with pale gray pollinosity; postalar callus brownish yellow, pleuron with brownish yellow stripe between mid coxa and wing base. Setulae on thorax blackish, setae black; setulae on scutum slightly long and rather sparse; humeral seta absent, 2 npl (posterior npl slightly longer), biseriate acr, uniseriate hair-like dc nearly as long as acr, 1 long prsc, 1 psa nearly as long as prsc; scutellum with 6 short brownish yellow marginal setulae and 2 long black sc. Legs yellow except hind femur widely black at middle and hind knee blackish; tarsi brownish yellow with tarsomeres 3–5 blackish. Setulae on legs blackish, setae black, except coxae with nearly entirely brownish yellow setulae and femora with partly brownish yellow setulae; femora, tibiae and tarsomere 1 with some long thin setulae. Fore femur 1.25 times and hind femur 2.9 times as wide as mid femur. Hind femur with 3–4 long preapical ad and two rows of short spinose ventral setae on weak tubercles (but in three rows at base). Fore tibia with 1 ad at middle; apically with 2–3 short setae. Mid tibia with 2 long ad; apically with 1 slightly short ad and 1 long av. Hind tibia apically with 1 av. Hind tarsomeres 1–2 with several short ventral spines. Wing nearly hyaline; stigma long, brown; veins dark brown, R_{4+5} and M_1 distinctly divergent apically. Squama yellow with yellowish setulae. Halter yellow.

Abdomen nearly straight or weakly curved downward, subshiny black with thin pale gray pollinosity; hypopygium weakly swollen. Setulae and setae on abdomen dark yellow.

Male genitalia (Figs. 1–4). Left epandrial lamella slightly longer than right epandrial lamella, with weakly concave inner margin; left surstylus irregularly and widely bifurcated.

Right epandrial lamella with weakly concave inner margin; right surstylus narrowly bifurcated. Hypandrium about 2 times longer than wide, apically narrowly furcated.

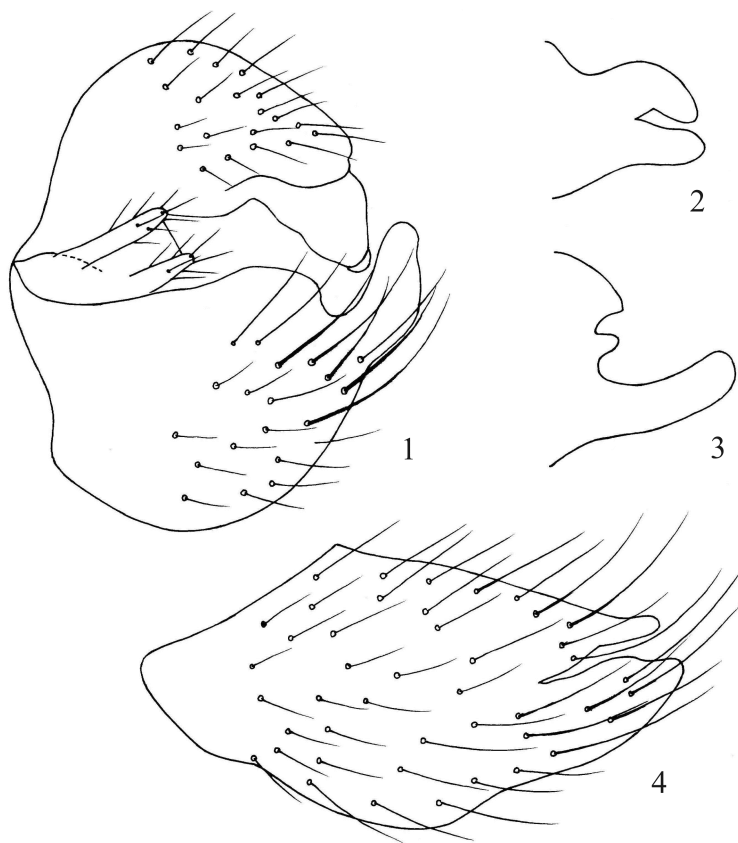
Female. Body length 3.6–4.3 mm, wing length 4.7–5.3 mm. Similar to male, but legs lacking long setulae.

Holotype. ♂, **Paratypes.** 6♂12♀, **China**, Gansu, Diebu, Lazikoulinchang, Laolonggou, 25-VII-2015, Shuangmei DING (CAU).

Remarks. This new species is somewhat similar to *H. gutianshanus* Yang et Yang from Zhejiang, but may be separated from the latter by the hind femur widely black at middle and right and left surstyli irregularly furcated. In *H. gutianshanus*, the hind femur is darkened dorsally, and the right and left surstyli are long hook-like (Yang & Yang 2004).

Distribution. China (Gansu).

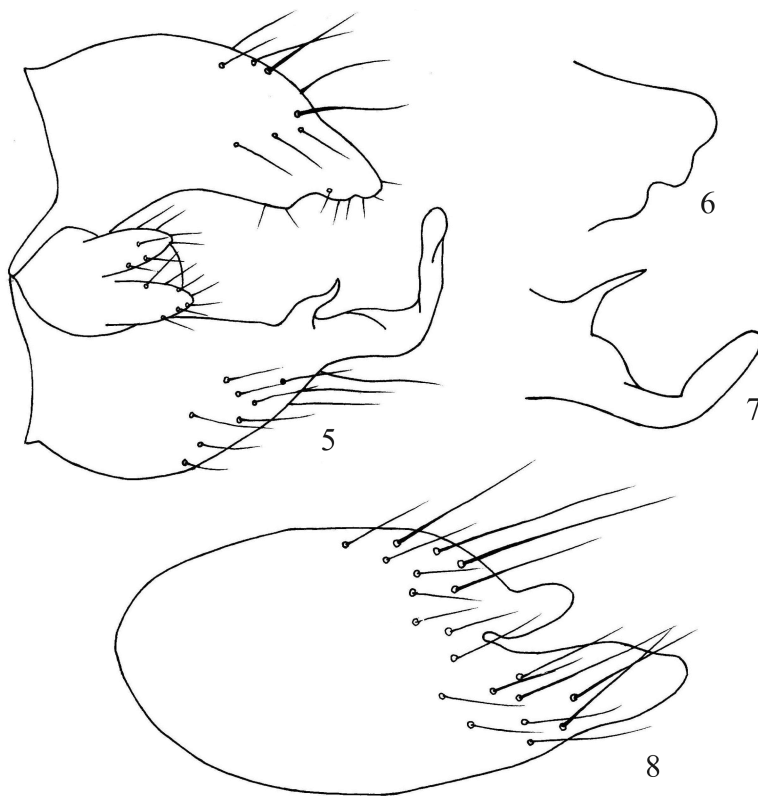
Etymology. The species epithet is named after type locality Diebu.



Figures 1–4. *Hybos diebuensis* sp. nov. ♂. 1. Genitalia, dorsal view; 2. Right surstylus; 3. Left surstylus; 4. Hypandrium, ventral view.

2. *Hybos trisetia* sp. nov. (Figs. 5–8)

Diagnosis. First flagellomere distinctly elongated, slightly longer than scape and pedicel combined. Legs black. Fore and mid femora each with row of long hair-like pv. Mid tibia with 3 long ad. Wing nearly hyaline with dark brown stigma. Right surstylus short and wide. Hypandrium apically furcated.



Figures 5–8. *Hybos triseta* sp. nov. ♂. 5. Genitalia, dorsal view; 6. Right surstylus; 7. Left surstylus; 8. Hypandrium, ventral view.

Male. Body length 3.6–4.1 mm, wing length 3.7–4.2 mm.

Head black with pale gray pollinosity. Eyes contiguous on frons, brown, with slightly enlarged upper facets. Setulae and setae on head black; ocellar tubercle distinct with 2 long oc and 2 short posterior setulae. Antenna black; scape without setulae, pedicel with circlet of subapical setulae; first flagellomere distinctly elongated, slightly longer than scape and pedicel combined, without dorsal setula; arista much longer than basal 3 antennal segments, short pubescence except apical 1/3 or so thin and bare. Proboscis slightly shorter than head, black. Palpus black, with 4 ventral setulae.

Thorax black with pale gray pollinosity which is dense on mesoscutum. Setulae and setae on thorax black; setulae on scutum distinct and sparse; humeral seta absent, 2 npl (posterior npl long), irregularly quadriseriate acr, uniseriate hair-like dc nearly as long as acr, 1 long prsc, 1 psa nearly as long as prsc; scutellum with 8 short marginal setulae (2 setulae between sc) and 2 long sc. Legs black except hind knees brown. Setulae on legs mostly brownish yellow except those on tibiae and tarsi partly blackish; setae black. Fore femur 1.15 times and hind femur 2.45 times as wide as mid femur. Fore and mid femora each with row of long hair-like pv. Hind femur with 3 long preapical ad and two rows of short spinose ventral setae on weak tubercles (av longer than pv, but in three rows at base). Fore tibia and tarsomere 1 with some

long thin setulae. Fore tibia with 1 ad at middle; apically with 3 setae (of which 1 ad is thick). Mid tibia with 3 long ad; apically with 4–5 long thin setae. Hind tibia with 5 long thin hair-like pd; apically with 1 strong av and 1 long thin subapical ad. Hind tarsomeres 1–2 with several short ventral spines. Wing nearly hyaline; stigma long, dark brown; veins dark brown, R_{4+5} and M_1 weakly divergent apically. Squama brownish yellow with dark yellow setulae. Halter yellow except base brown.

Abdomen weakly curved downward, subshiny black with thin pale gray pollinosity; hypopygium weakly swollen. Setulae and setae on abdomen dark yellow except hypopygium with black setulae and setae.

Male genitalia (Figs. 5–8). Left epandrial lamella slightly longer than right epandrial lamella, with weakly concave inner margin; left surstylus nearly geniculate with hook-like basal process. Right epandrial lamella with distinctly concave inner margin; right surstylus short and wide. Hypandrium about 2.5 times longer than wide, irregularly furcated apically.

Female. Body length 3.2–4.1 mm, wing length 3.7–4.7 mm. Similar to male.

Holotype. ♂. **Paratypes.** 2♂4♀, **China**, Gansu, Diebu, Lazikoulinchang, Laolonggou, 25-VII-2015, Xiaoli LI (CAU). 4♂1♀, **China**, Gansu, Diebu, Lazikoulinchang, Laolonggou, 25-VII-2015, Shuangmei DING (CAU); 2♂3♀, **China**, Gansu, Diebu, Lazikoulinchang, Laolonggou, 26-VII-2015, Shuangmei DING (CAU).

Remarks. This new species is similar to *H. biancistrioides* Yang et Li from Hubei, but may be separated from the latter by the right surstylus short and wide and hypandrium apically furcated. In *H. biancistrioides*, the right surstylus is long and hook-like, and the hypandrium is not furcated apically (Yang & Li 2011).

Distribution. China (Gansu).

Etymology. The specific epithet refers to the mid tibia having 3 setae.

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References

- Chvála M. 1983. The Empidoidea (Diptera) of Fennoscandia and Denmark. II. General Part. The families Hybotidae, Atelestidae and Microphoridae. *Fauna Entomologica Scandinavica*, 12: 1–279.
- Cumming JM & Wood DM. 2009. Adult morphology and terminology. In: Brown BV, Borkent A, Cumming JM, Wood DM, Woodley NE & Zumbado MA (Eds.), *Manual of Central American Diptera*. Vol. 1. NRC Research Press, Ottawa, pp. 9–50.
- Huo S, Grootaert P & Yang D. 2010. Two new yellow-legged species of the genus *Hybos* from Viet Nam (Diptera: Empidoidea: Hybotinae). *Zootaxa*, 2512: 47–55.
- Jiang W, Li Z & Yang D. 2011. Two new species of *Hybos* from Taiwan (Diptera: Empidoidea). *Transactions of the American Entomological Society*, 137(3–4): 355–358.
- Li WH & Yang D. 2009. Species of *Hybos* Meigen from Ningxia, Palaearctic China (Diptera, Hybotidae).

Revue Suisse de Zoologie, 116(3-4): 353–358.

- Li Z, Wang N & Yang D. 2014. New species of the genus *Hybos* Meigen from Northwest China (Diptera: Empidoidea, Hybotinae). *Zootaxa*, 3786(2): 166–180.
- Plant AR. 2013. The genus *Hybos* Meigen (Diptera: Empidoidea: Hybotidae) in Thailand. *Zootaxa*, 3690: 1–98.
- Shamshev IV, Grootaert P & Kustov S. 2015. New data on the genus *Hybos* Meigen (Diptera: Hybotidae) from the Palaearctic Region. *Zootaxa*, 3936(4): 451–484.
- Shamshev IV, Grootaert P & Yang D. 2013. New data on the genus *Hybos* (Diptera: Hybotidae) from the Russian Far East, with description of a new species. *Russian Entomological Journal*, 22(2): 141–144.
- Shi L, Yang D & Grootaert P. 2009. New *Hybos* species from Oriental China (Diptera: Empididae). *Transactions of the American Entomological Society*, 135(1-2): 189–192.
- Yang D. 2008. Two new yellow-legged species of *Hybos* from Hainan, China (Diptera: Hybotidae). *Revue Suisse de Zoologie*, 115(4): 617–622.
- Yang D & Li WH. 2011. Two new species of *Hybos* Meigen from Oriental China (Diptera, Empidoidea, Hybotidae). *Revue Suisse de Zoologie*, 118(1): 93–98.
- Yang D & Yang CK. 2004. *Diptera, Empididae, Hemerodromiinae and Hybotinae. Fauna Sinica Insecta, Vol. 34*. Science Press, Beijing, 329 pp.
- Yang D, Zhang KY, Yao G & Zhang JH. 2007. *World Catalog of Empididae (Insecta: Diptera)*. China Agricultural University Press, Beijing, 599 pp.