

One new species in the subgenus *Bactrocera* (Diptera: Tephritidae) from Yunnan, China

Zhen HUANG^{1,2}, Hui YU³, Yonghua BAI⁴, Youming HOU^{1①}, Qiongxia GUO⁵

1. College of Plant Protection, Fujian Agriculture and Forestry University, Fuzhou, Fujian 350002, China

2. Changle Airport Customs, Fuzhou, Fujian 350209, China

3. Shanghai Agricultural Technology Extension and Service Centre, Shanghai 201103, China

4. Mengla Customs Comprehensive Technology, Mengla, Yunnan 666300, China

5. Fuzhou Customs Inspection and Quarantine Technology Center, Fuzhou, Fujian 350001, China

Abstract: One new species, *Bactrocera* (*Bactrocera*) *latizona* Huang, Yu & Bai **sp. nov.**, from Mengla, Yunnan Province, China is described. Illustrations of the new species and a key to common species of the subgenus of *Bactrocera* from Yunnan are given.

Key words: fruit flies; taxonomy; key

中国云南果实蝇亚属一新种记述（双翅目：实蝇科）

黄振^{1,2}, 余慧³, 白永华⁴, 侯有明^{1①}, 郭琼霞⁵

1. 福建农林大学植物保护学院, 福建 福州 350002; 2. 福州长乐机场海关, 福建 福州 350209; 3. 上海市农业技术推广服务中心, 上海 201103; 4. 勐腊海关综合技术中心, 云南 勐腊 666300; 5. 福州海关技术中心, 福建 福州 350001

摘要:记述我国云南果实蝇亚属 1 新种, 阔带果实蝇 *Bactrocera* (*Bactrocera*) *latizona* Huang, Yu & Bai **sp. nov.**, 附特征图, 并提供了阔带果实蝇近似种的分种检索表。

关键词: 实蝇; 分类; 检索表

Introduction

Bactrocera Macquart, 1835 is the largest genus in the family Tephritidae. It is also one of the most economically important groups within the family. Fruit flies of *Bactrocera* are distributed mainly in tropical Asia. There were 369 known species of *Bactrocera* in Southeast Asia (Drew & Roming 2013). In China, more than 64 species of *Bactrocera* have been recorded by Wang (1996), Wang *et al.* (2008), Lin *et al.* (2005, 2006, 2011), Chen *et al.* (2011, 2012), Zhang *et al.* (2011, 2012), Yu *et al.* (2011a, 2011b, 2012) and Zhou *et al.* (2013). While checking specimens from Yunnan Province, we discovered a new species collected in Mengla.

Material and methods

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① Corresponding author, E-mail: ymhou@fafu.edu.cn

Genitalia preparations were made by removing and macerating the apical portion of the abdomen in cold saturated NaOH for 12–14 h. After maceration, genitalia were examined in fresh glycerine and stored in a microvial pinned below the specimen.

The general terminology follows White *et al.* (1999). The following abbreviations are used: a spal s – anterior supra-alar seta, fr s – frontal seta, gn s – genal seta, ial s – intra-alar seta, i vt s – inner vertical seta, npl s – notopleural seta, orb s – orbital seta, o vt s – outer vertical seta, pprn s – postpronotal seta, psctl acr s – prescutellar acrostichal seta, p spal s – posterior supra-alar seta, scap – scapula setae, sctl s – scutellar seta.

The type specimens are deposited in Mengla Customs Comprehensive Technology.

Taxonomy

The subgenus *Bactrocera* can be easily identified by the following characters: chaetotaxy of head and thorax reduced, lacking ocellar, dorsocentral, katepisternal and postpronotal setae; anterior supra-alar and prescutellar acrostichal setae present, one pair of scutellar setae; abdominal terga free; pecten of cilia present on tergum III of male; sternite V of male deeply concave at posterior margin; posterior lobe of surstylus short (Drew 1989; Wang 1996).

Key to similar species of *Bactrocera* (*Bactrocera*) *latizona*

1. Scutum red-brown in ground color 2
- Scutum black in ground color 4
2. Wing with a narrow fuscous costal band confluent with R_{2+3} and ending at apex of R_{2+3} , a small oval fuscous spot across apex of R_{4+5} *B. (B.) zonata* (Saunders)
- Wing with a narrow fuscous costal band confluent with R_{2+3} and widened slightly across apex of wing 3
3. Scutum red-brown with a central black pattern consisting of black across posterior area and three narrow longitudinal black lines extending to anterior margin; terga III–V reddish brown with a dark “T” pattern *B. (B.) bivittate* (Lin & Wang)
- Scutum red-brown with a dark fuscous to black lanceolate pattern; terga III–V orange brown with a dark “T” pattern, narrow anterolateral dark fuscous margins on terga IV and V *B. (B.) rubigina* (Wang & Zhao)
4. Frons fulvous, with a brown to black transverse band across lower 1/3, the band usually narrowed or interrupted in median portion *B. (B.) correcta* (Bezzi)
- Frons fulvous, with 2 black spots 5
5. Wing with a wide costal band confluent with R_{4+5} *B. (B.) limbifera* (Bezzi)
- Wing with a narrow costal band confluent with R_{2+3} or overlapping R_{2+3} 6
6. Wing with a fuscous costal band confluent with R_{2+3} and ending at apex of R_{2+3} , a small elongate fuscous to dark fuscous spot around apex of R_{4+5} *B. (B.) tuberculata* (Bezzi)
- Wing with a complete costal band 7
7. All femora entirely fulvous 8
- At least fore femora with dark color patterns 10
8. Wing with a fuscous costal band confluent with R_{2+3} *B. (B.) dorsalis* (Hendel)
- Wing with a fuscous costal band overlapping R_{2+3} 9
9. Costal band overlapping R_{2+3} and widened markedly across apex of wing; terga III–V with a narrow transverse black band across anterior margin of tergum III and with a very broad medial longitudinal black band over all three terga *B. (B.) occipitalis* (Bezzi)

- Costal band overlapping R_{2+3} and widened slightly across apex of wing; terga III–V dark orange-brown without distinct dark color patterns..... *B. (B.) latifrons* (Hendel)
- 10. Two short and narrow lateral postsutural vittae narrowed sharply posteriorly, ending at level of anterior supra-alar seta..... 11
- Two lateral postsutural vittae long, ending behind level of anterior supra-alar seta 12
- 11. Fore femora black with fulvous on inner surfaces; costal band confluent with R_{2+3} and widened markedly across apex of wing..... *B. (B.) wuzhishana* Lin & Yang
- Fore femora fulvous with small black subapical spots on outer surfaces; costal band confluent with R_{2+3} and remaining narrow around apex of wing..... *B. (B.) flavoscutellata* (Lin & Wang)
- 12. Wing with a fuscous costal band confluent with R_{2+3} 13
- Wing with a fuscous costal band overlapping R_{2+3} 15
- 13. Postsutural vittae yellow, ending before intra-alar seta; fore femora fulvous with black subapical spots on outer surfaces..... *B. (B.) thailandica* Drew & Hancock
- Postsutural vittae yellow, ending at or just behind intra-alar seta; fore femora fulvous with dark fuscous covering entire outer surfaces or with black spots on outer apical 1/2 14
- 14. Costal band confluent with R_{2+3} and widened slightly across apex of wing; fore femora fulvous with black spots on outer apical 1/2 and mid femora fulvous with small black spots on apex.....
..... *B. (B.) lombokensis* Drew & Hancock
- Costal band confluent with R_{2+3} and narrowed around apex of wing; fore femora fulvous with dark fuscous covering entire outer surfaces, mid femora black centrally with dark fuscous basally and apically
..... *B. (B.) nigrifacia* Zhang, Ji & Chen
- 15. Scutum entirely black without markings; postsutural vittae yellow, ending before intra-alar seta; terga IV–V with two broad lateral longitudinal black bands *B. (B.) citima* (Hardy)
- Scutum black with red-brown markings; postsutural vittae yellow, ending at intra-alar seta; terga IV–V without broad lateral longitudinal black band..... *B. (B.) latizona* **sp. nov.**

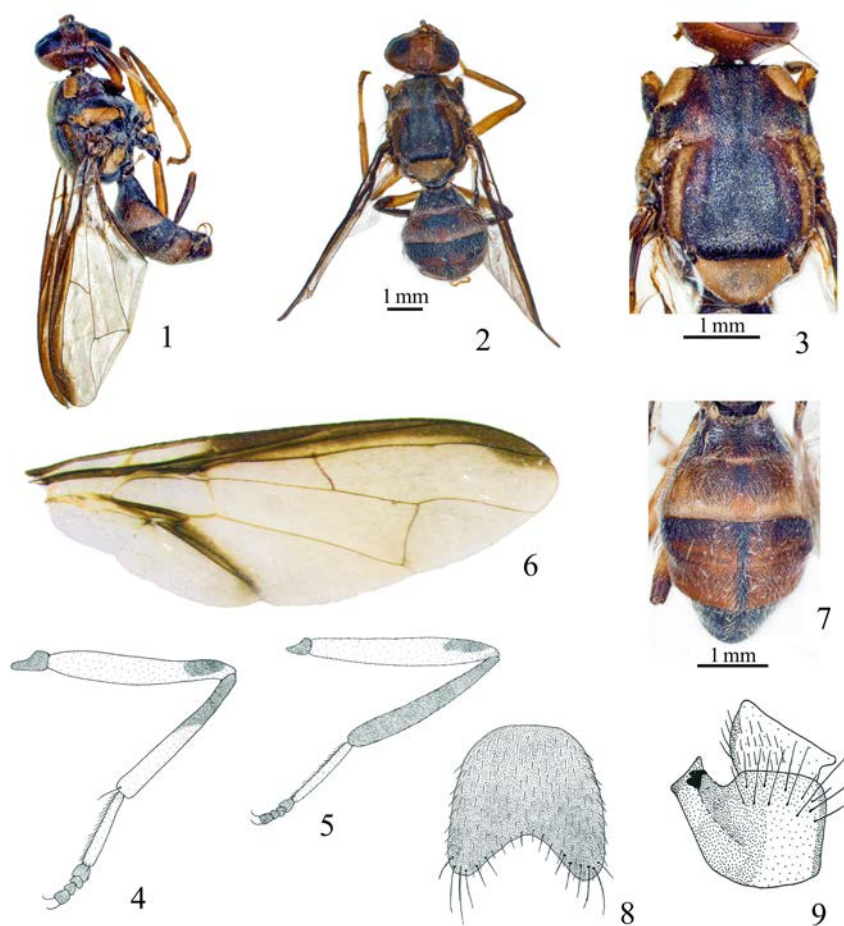
***Bactrocera (Bactrocera) latizona* Huang, Yu & Bai sp. nov.** (Figs 1–9)

Description. Male. Body length 7.7–8.0 mm, wing length 5.3–5.7 mm.

Head fulvous. Frons fulvous, anteriorly with fuscous median hump and a few short setulae on hump; ocellar triangle black; a fuscous mark extended across vertex and connected with ocellar triangle; lunule fuscous; face fulvous with one pair of long oval black facial spots; gena fulvous with a fuscous spot below each eye; occiput fuscous. Occipital row with some black setae. Setae on head black; 2 fr s, 1 orb s, with spots at base of fr s and orb s; 1 i vt s, 1 o vt s and 1 gn s. Antenna fulvous except first flagellomere dark brown on apex and outer surface; scape with a few brown to black setulae dorsally, pedicel with 1 dark brown seta, first flagellomere 4–5 times longer than deep; arista bare, black but yellow basally; length of segments: 0.24 mm, 0.36 mm, 0.58 mm. Proboscis and palpus fulvous.

Thorax (Fig. 3). Scutum black with red-brown below and behind lateral postsutural vittae and anterior of inside lateral postsutural vittae, around notopleural suture, inside postpronotal lobes. Pleuron predominantly dark brown to black with following yellow markings: postpronotal lobes; notopleuron; anepisternal stripe; small spots on katapisternum, anatergite, anterior 4/5 of katatergite. Two yellow mid lateral vittae parallel, ending at base of ial s; median vitta absent. Postnotum shining black. Scutellum yellow with a narrow black band at base. Setulae and setae on thorax black; 1 a spal s, 1 pal s, 1 ial s, 2 psctl acr s and 2 sctl s; 2 npl s and 4 scap s. Legs mainly yellow; coxae and trochanters dark brown to black; apical 1/2

of outer surfaces of fore femora shining black; inner apical surfaces of mid and hind femora black (Figs 4, 5); basal portions of fore and mid tibiae dark brown; hind tibiae dark brown; tarsi fulvous. Mid tibiae each with a black apical spur. Wing (Fig. 6) hyaline in ground color; costal band wide, dark brown, almost confluent with R_{4+5} and slightly expanded at apex; anal streak narrow and extending to posterior margin; cells bc and c colorless; microtrichiae located only at outer corner of cell c, dense setulae covering A_1+CuA_2 . Supernumerary lobe weak. Halter yellowish.



Figures 1–9. *Bactrocera (Bactrocera) latizona* Huang, Yu & Bai **sp. nov.**, ♂. 1. Male habitus, lateral view; 2. Male habitus, dorsal view; 3. Thorax; 4. Mid leg; 5. Hind leg; 6. Wing; 7. Abdomen, dorsal view; 8. Sternum; 9. Epandrium (cercus and surstylus), lateral view.

Abdomen (Fig. 7). Oval in outline, generally yellow to fulvous. Tergum I and sterna I–II wider than long. Tergum I dark brown to black; tergum II yellow to fulvous with a small transverse dark brown to black spot anteriorly on mid line; terga III–V yellow to fulvous with T-shaped pattern consisting of a transverse black band across anterior margin of tergum III and a narrow mid-longitudinal dark brown to black band over all three terga (in some specimens, the tergum V is black); pecten of cilia present on posterior margin of tergum III. A

pair of oval fuscous shining spots on tergum V. Sterna I, III–V dark brown to black; sternum II yellowish. Sternum V deeply concave on posterior margin (Fig. 8). Epandrium large and broad, posterior surstylus lobe short, lateral surstylus with apex slightly angulated in lateral view (Fig. 9). Glans with slender and membranous subapical lobe.

Female. Unknown.

Holotype. ♂, **China**, Yunnan, Mengla, VIII-2011, Yonghua BAI. **Paratypes.** 3♂, same data as holotype.

Etymology. The specific epithet refers to the wide costal band of the wing.

Diagnosis. Face fulvous with one pair of long oval black facial spots. Scutum black with red-brown markings. Apical 1/2 of outer surfaces of fore femora shining black, inner apical surfaces of mid and hind femora black. Costal band wide, dark brown, almost confluent with R_{4+5} and slightly expanded at apex. Terga IV–V without broad lateral longitudinal black band.

Remarks. These new species is somewhat similar to *B. (B.) costalis* (Shiraki, 1933) and *B. (B.) citima* (Hardy, 1973) in the following characters: face pale yellow with black spots; scutum black with two lateral postsutural vittae; scutellum yellow with a narrow black band at base; abdominal terga III–V yellow to fulvous with T-shaped pattern. It can be separated from the *B. (B.) costalis* (Shiraki) and *B. (B.) citima* (Hardy) by the following characters: postpronotal lobes entirely yellow, scutum black with red-brown markings, postsutural vittae yellow, ending at intra-alar seta, apical 1/2 of outer surfaces of fore femora shining black, inner apical surfaces of mid and hind femora black, costal band dark brown, almost confluent with R_{4+5} , anal streak narrow, terga IV–V without broad lateral longitudinal black band. However, in *B. (B.) costalis*, the fore femur has a small oval fuscous spot subapically, the mid and hind femora are yellow, and the costal band of the wing is dark brown and confluent with R_{4+5} , anal streak is broad; in *B. (B.) citima*, the postpronotal lobes are yellow with the fuscous anterodorsal corners, the scutum is entirely black without markings, the postsutural yellow vittae are located before the intra-alar seta, the mid femur is fulvous with dark fuscous around apical 1/3, the hind femur is fulvous with dark fuscous around apex, anal streak of the wing is broad, terga IV–V have two broad lateral longitudinal black bands (Hardy 1973; Shiraki 1933).

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References

- Bezzi M. 1916. On the fruit-flies of the genus *Dacus* (s. l.) occurring in India, Burma, and Ceylon. *Bulletin of Entomological Research*, 7: 99–121.
- Bezzi M. 1919. Fruit flies of the genus *Dacus* sensu-latiore (Diptera) from the Philippine Islands. *Philippine Journal of Science*, 15: 411–443.
- Chen XL, Zhou LB, Wang SJ, Li ZW & Li J. 2011. A new species and record of *Bactrocera* Macquart (Diptera, Tephritidae) from China. *Zootaxa*, 3014: 59–64.
- Chen XL, Zhou LB, Han H & Bai YH. 2012. New species and record of *Bactrocera* Macquart (Diptera, Tephritidae) from China and Laos. *Entomotaxonomia*, 34(2): 351–355.
- Drew RAI. 1989. The tropical fruit flies (Diptera: Tephritidae: Dacinae) of the Australasian and Oceanian

- Regions. *Memoirs of the Queensland Museum*, 26: 1–521.
- Drew RAI & Hancock DL. 1994. The *Bactrocera dorsalis* complex of fruit flies (Diptera: Tephritidae: Dacinae) in Asia. *Bulletin of Entomological Research*, 2(supplement): 1–68.
- Drew RAI & Roming MC. 2013. *Tropical fruit flies (Tephritidae: Dacinae) of South-East Asia*. CAB International, Wallingford, 653 pp.
- Hardy DE. 1973. The fruit flies (Diptera, Tephritidae) of Thailand and bordering countries. *Pacific Insects Monograph*, 31: 353.
- Hendel FG. 1912. H. Sauter's Formosa-Ausbeute. Genus *Dacus*, Fabricius (1805) (Diptera). *Supplementa Entomologica*, 1: 13–24.
- Hendel FG. 1915. H. Sauter's Formosa-Ausbeute. Tephritinae. *Annales Musei Nationalis Hungarici*, 13: 424–467.
- Lin MG, Wang XJ, Li WD, Xu W & Chen XL. 2005. Taxonomic revision of the genus *Bactrocera* Macquart from Hainan, with description of two new species (Diptera, Tephritidae, Dacinae). *Acta Zootaxonomica Sinica*, 30: 842–847.
- Lin MG, Yang ZJ, Wang XJ, Li JY & Li WD. 2006. A taxonomic study of the subfamily Dacinae (Diptera: Tephritidae) from Hainan, China. *Acta Entomologica Sinica*, 49: 310–314.
- Lin MG, Wang XJ & Zeng L. 2011. Three new species of the genus *Bactrocera* Macquart (Diptera, Tephritidae, Dacinae) from Hainan, China. *Acta Zootaxonomica Sinica*, 36(4): 896–900.
- Saunders WW. 1842. Descriptions of four new dipterous insects from central and northern India. *Transactions of the Entomological Society of London*, 3: 59–61.
- Shiraki T. 1933. A systematic study of Trypetidae in the Japanese Empire. *Memoirs of the Faculty of Science and Agriculture, Taihoku Imperial University*, 8: 1–509.
- Wang XJ. 1996. The fruit flies (Diptera: Tephritidae) of the East Asian region. *Acta Zootaxonomica Sinica*, 21 (supplement): 1–338.
- Wang XJ, Xiao S, Chen XL, Long R & Zhang CL. 2008. Two new species of genus *Bactrocera* Macquart (Diptera, Tephritidae) from Yunnan, China. *Acta Zootaxonomica Sinica*, 33: 73–76.
- Wang XJ & Zhao MZ. 1989. Note on the genus *Dacus* Fabricius in China with descriptions of five new species (Diptera: Tephritidae). *Acta Zootaxonomica Sinica*, 14: 209–219.
- White IM, Headrick DH, Norrbom AL & Carroll LE. 1999. Glossary. In: Aluja M & Norrbom AL (Eds.), *Fruit Flies (Tephritidae): Phylogeny and Evolution of Behavior*. CRC Press, Boca Raton, pp. 881–924.
- Yu H, Bai YH, He WZ & Chen NZ. 2011b. Two new species and one new record species of the genus *Bactrocera* from Yunnan, China (Diptera: Tephritidae). *Acta Zootaxonomica Sinica*, 36: 604–609.
- Yu H, Bai YH, He WZ, Liu ZS & Yang D. 2011a. Three new species of the subgenus *Zeugodacus* from Yunnan, China (Diptera, Tephritidae). *Acta Zootaxonomica Sinica*, 36: 315–320.
- Yu H, Deng YL & Chen NZ. 2012. A new species of the subgenus *Sinodacus* from Yunnan, China (Diptera, Tephritidae). *Acta Zootaxonomica Sinica*, 37: 834–836.
- Zhang NN, Chen JH & Gao SD. 2011a. A new species of subgenus *Zeugodacus* Hendel (Diptera, Tephritidae) from China. *Acta Zootaxonomica Sinica*, 36: 321–324.
- Zhang NN, Ji QE & Chen JH. 2011b. Three new species and one new record of genus *Bactrocera* Macquart (Diptera: Tephritidae) from Yunnan, China. *Acta Zootaxonomica Sinica*, 36: 598–603.
- Zhang NN, Ji QE & Chen JH. 2012. A new species of the genus *Bactrocera* Macquart from China (Diptera, Tephritidae). *Acta Zootaxonomica Sinica*, 37: 206–208.
- Zhou LB, Chen XL, Deng YL & Wang SJ. 2013. Description of a new species and record of *Bactrocera* Macquart (Diptera, Tephritidae) from China. *Zootaxa*, 3647(1): 194–200.