A new species of *Brachineura* Rondani (Diptera: Cecidomyiidae: Cecidomyiinae) from Northeast China

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Abstract: A new Cecidomyiinae species, *Brachineura diplatypa* **sp. nov.** collected from Mao'er Mountain in Heilongjiang of China, is described and illustrated. It is the second record of the mycophagous genus *Brachineura* Rondani, 1840 from Northeast China. This new species is characterized by the unique sub-tapered aedeagus with the apex and the distal 1/3 both distinctly swollen. A newly revised generic diagnosis is given to distinguish *Brachineura* from all the other genera in the tribe Brachineurini. An updated key to all known *Brachineura* species in China is provided.

Key words: Brachineurini; taxonomy; key

中国东北地区博瘿蚊属 *Brachineura* Rondani 一新种记述（双翅目：瘿蚊科：瘿蚊亚科）

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摘要：第二次报道瘿蚊亚科菌食性的博瘿蚊属[②]*Brachineura* Rondani, 1840 在我国东北地区的分布，记述采于黑龙江帽儿山的 1 新种：双阔博瘿蚊 *Brachineura diplatypa* **sp. nov.**，并对本属属征进行修订，以便与短脉瘿蚊族内的所有其他属进行区分，同时更新了中国该属的分种检索表。该新种具独特的近锥状阳茎，其端部和近端部 1/3 处均明显肿胀膨大。

关键词：博瘿蚊族；分类；检索表

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② *Brachineura* Rondani, 1840，其中文名曾称“短脉瘿蚊属”(Jiao *et al*. 2020)，但鉴于原中文名易产生歧义而误认为该属翅脉相对较短是主要鉴定特征，且该属种类广博繁多、形态各异，故将其中文名改为“博瘿蚊属”为宜，并相应修改其族级中文名为“博瘿蚊族”Brachineurini 和“博瘿蚊总族”Brachineuridi。

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Introduction

Until now, the cosmopolitan genus *Brachineura* Rondani, 1840 in the tribe Brachineurini (Cecidomyiidae: Cecidomyiinae: Brachineuridi) was comprised of 31 species including 30 extant ones and 1 fossil (Gagné & Jaschhof 2021). Prior to this study, only Jiao *et al*. (2018) first reported three *Brachineura* species distributed in China. During an inspection of an early collection of Cecidomyiidae specimens from Northeast China in the summer of 2003, another new species, *Brachineura diplatypa* **sp. nov.**, was discovered from Lüjiaweizi, Mao'er Mountain, Shangzhi, Heilongjiang. In the present paper, this new species is described, illustrated and photographed along with its diagnosis and comparison to the close congeneric one. An updated key to males of all known *Brachineura* species in China is provided. To distinguish *Brachineura* from all the other Brachineurini genera, a revised generic diagnosis is given.

Material and methods

The rare adult midge specimens were preserved in 90% ethanol in the field immediately after collection by Malaise traps. For morphological observation, all of the ethanol preserved specimens were dissected into four parts: head, thorax without wings, abdomen and wings. They were then mounted on slides using Canada balsam. The morphological terminology follows Gagné (2018). The holotype and the paratype are both deposited in the Institute of Entomology, College of Life Sciences, Nankai University (NKUM), Tianjin, China. All figures are based on the holotype of this new species (slide number: NKUCecid. No. BBG001). Figures 1 and 2 are line drawings, and Figures 3 and 4 are photographed by microscope and photomontaged by Auto-Montage software (Helicon Focus 6.7.1 Pro).

Taxonomy

Genus *Brachineura* Rondani, 1840

Brachineura Rondani, 1840: 16. Type species: *Brachineura fuscogrisea* Rondani, 1840; by monotypy.

Other citations listed in detail by Gagné & Jaschhof (2021): 226.

Revised diagnosis. Head with a finger-shaped raised structure with dense setae between the two antennal bases. Scutum completely covered with scales. Vein R_5 bent a little forward in the middle, joining vein C distinctly anterior to wing apex; vein CuA not forked. Gonocoxite without any distal lobes. Gonostylus without basal lobes. Cerci with a deep depression forming two broad lobes. Aedeagus without a ventral plate having two lobes.

Remarks. The latest diagnosis of the genus *Brachineura* was provided by Jiao *et al*. (2018). According to the newest classification by Gagné & Jaschhof (2021), the generic diagnosis needs to be revised to distinguish *Brachineura* from all the other genera in the tribe Brachineurini. In the present paper, the genus *Brachineura* encompasses 32 species with the new species, *Brachineura diplatypa* **sp. nov.** from Mao'er Mountain, Heilongjiang of Northeast China. Now among them are 4 Chinese ones, so an updated key for their separation

is given below.

Key to known species in China (♂)

1. Gonostylus with the basal half distinctly swollen to an irregular ellipsoid-shaped; gonostylus approximately as long as half length of gonocoxite ····· *B. sphaerica* Jiao & Bu
-. Gonostylus with the basal half slightly swollen or enlarged, not spherical or ellipsoidal; gonostylus distinctly longer than half length of gonocoxite ····· 2
2. Aedeagus prolonged, approximately two times as long as the length of gonocoxite; hypoproct emarginated forming two triangular lobes ····· *B. prodolichata* Jiao & Bu
-. Aedeagus slightly longer than or as long as gonocoxite, and distinctly shorter than 1.5 times the length of gonocoxite; hypoproct emarginated forming two slender lobes ····· 3
3. Aedeagus stout and sub-cylindrical, ventrally with a blister-like protrusion in the sub-apex and dorsally with a finger-shaped structure in the middle ····· *B. physiphora* Jiao & Bu
-. Aedeagus sub-tapered, with the apex and the distal 1/3 both distinctly swollen ····· *B. diplatypa* **sp. nov.**

***Brachineura diplatypa* Jiao, Jin & Bu sp. nov.** (Figs 1–4)

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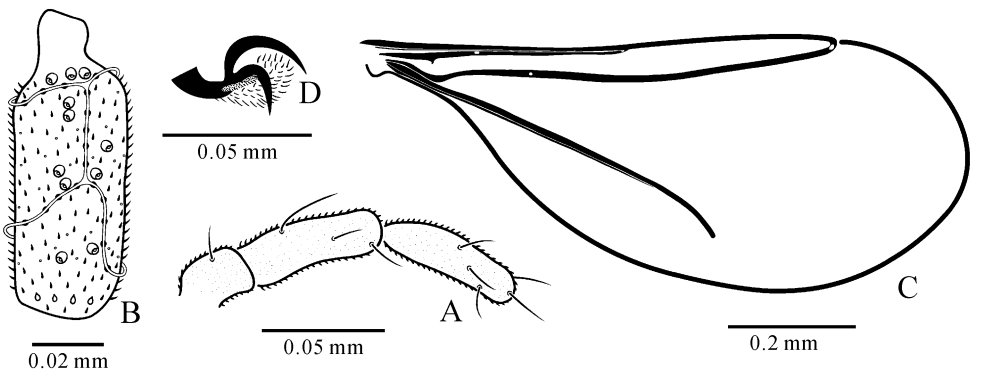

Figure 1. *Brachineura diplatypa* Jiao, Jin & Bu **sp. nov.** (Male holotype, NKUCecid. No. BBG001). A. Palpus, lateral view; B. Third flagellomere, ventral view; C. Wing, dorsoventral view; D. Fore tarsal claw with empodium and pulvillus, lateral view.

Description. Body color brownish yellow. Body length: 1.13–1.23 mm (n = 2). Wing length (measured from the base): 1.00–1.02 mm (n = 2). Wing width: 0.40–0.42 mm (n = 2).

Head (Figs 1A, 1B, 3A). Postvertical peak missing. Eye bridge 5 facets long in the middle of vertex. Palpus sparsely setose, fixed to be 3-segmented, the third segment as long as the second one, and both significantly longer than the first one (Figs 1A, 3A). Scape larger than pedicel, both covered with setae ventrally. Flagellomeres fixed to be 10 in number (Fig. 3A), all uninodal (Fig. 1B) with subcylindrical node and relatively extremely shorter neck except for the last one without a neck, first and second fused. Each node covered with a dozen horseshoe-shaped alveoli from the basal 1/4 to the distal and microtrichia elsewhere, and 2 whorls of long, strong, and irregular setae, one at the subbasal and the other at the subapex, and with two laps of mostly latitudinal, appressed, band-shaped circumfila, subbasally and apically respectively, linked by two similar longitudinal and shorter circumfila. 3rd male flagellomere (Fig. 1B) with the node 2.30–2.35 times as long as wide and the neck 1.20–1.26

times as long as wide, 0.21–0.22 times length of node.

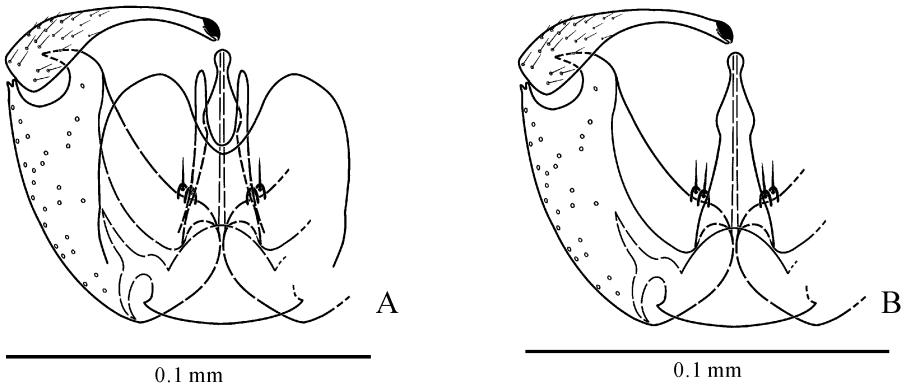

Figure 2. *Brachineura diplatypa* Jiao, Jin & Bu **sp. nov.** (Male holotype, NKUCecid. No. BBG001). A. Genitalia, most of right gonopod and the setae on cerci and hypoproct removed, dorsal view; B. Genitalia, cerci, hypoproct and most of right gonopod removed, dorsal view.

Thorax (Figs 1C, 1D, 3B–D). Wing (Figs 1C, 3C) hyaline, 2.47–2.48 times as long as wide, sparsely covered with narrow scales and setose. Rs barely visible; Sc weak; R_1 bent slightly upward, joining C at the basal 2/5 of wing, with two pores at basal 2/5 and near the apex, respectively; R_5 with a U-shaped broad depression near basal 1/9, bent upward near the middle, joining C at the basal 3/4 of wing, with two pores at basal 1/3 and near the apex, respectively; M_3 missing; CuA unforked and bent backward, with the distal part almost invisible; vein CuP parallel with the basal half of CuA. Legs covered with narrow scales and sparse setae. Tarsal claw (Figs 1D, 3D) toothed on all legs; empodium upwardly curved, setulose, approximately as long as the claw; pulvillus flagelliform, slightly bent upward, half length of the claw.

Abdomen (Fig. 3E). Each tergite and sternite covered uniformly with scales. First to sixth tergites stripe-shaped, with a single, posterior row of setae, and with one anterior pair of trichoid sensilla, covered with many lateral and central setae; seventh tergite as sixth but distinctly shorer, except for a double, posterior row of setae; eighth tergite reduced to one strongly sclerotized and linear band. Second to sixth sternites subrectangular with an irregular but mostly single, posterior row of setae, and with one anterior pair of closely set trichoid sensilla, and covered with many lateral and central setae; seventh sternite as sixth but narrower; eighth sternite crescent, distinctly smaller than seventh, with one anterior pair of closely set trichoid sensilla, and densely covered with setae. Male genitalia (Figs 2, 4): gonocoxite slender, covered with many scattered longer setae, with the mediobasal lobe undeveloped and reduced to a pair of closely set setae, each inserted in a small, glabrous and sclerotized prominence; gonostylus prolonged and slender, approximately 3/4 length of gonocoxite, with the basal 1/4 broadened and aequilate, tapered from the basal 1/3 to the middle, slender, elongated, approximately aequilate and curved evenly inward from the middle to the distal, covered with dense microtrichia at the basal 1/3 and sparse setae at the basal half, distally with a distinct strongly sclerotized distal tooth, subdistally and dorsally

with one short seta close to the distal tooth; cerci separated with a wide depression forming two broad, thumb-shaped lobes, each ventrally and outwardly with several apical setae; hypoproct as long as cerci, emarginated deeply and widely with a U-shaped depression forming two extremely slender and elongated lobes, each ventrally and outwardly with several apical setae; aedeagus as long as gonocoxite, gradually tapered from base to apex except for the apex and the distal 1/3 both distinctly swollen, with the distal margin rounded.

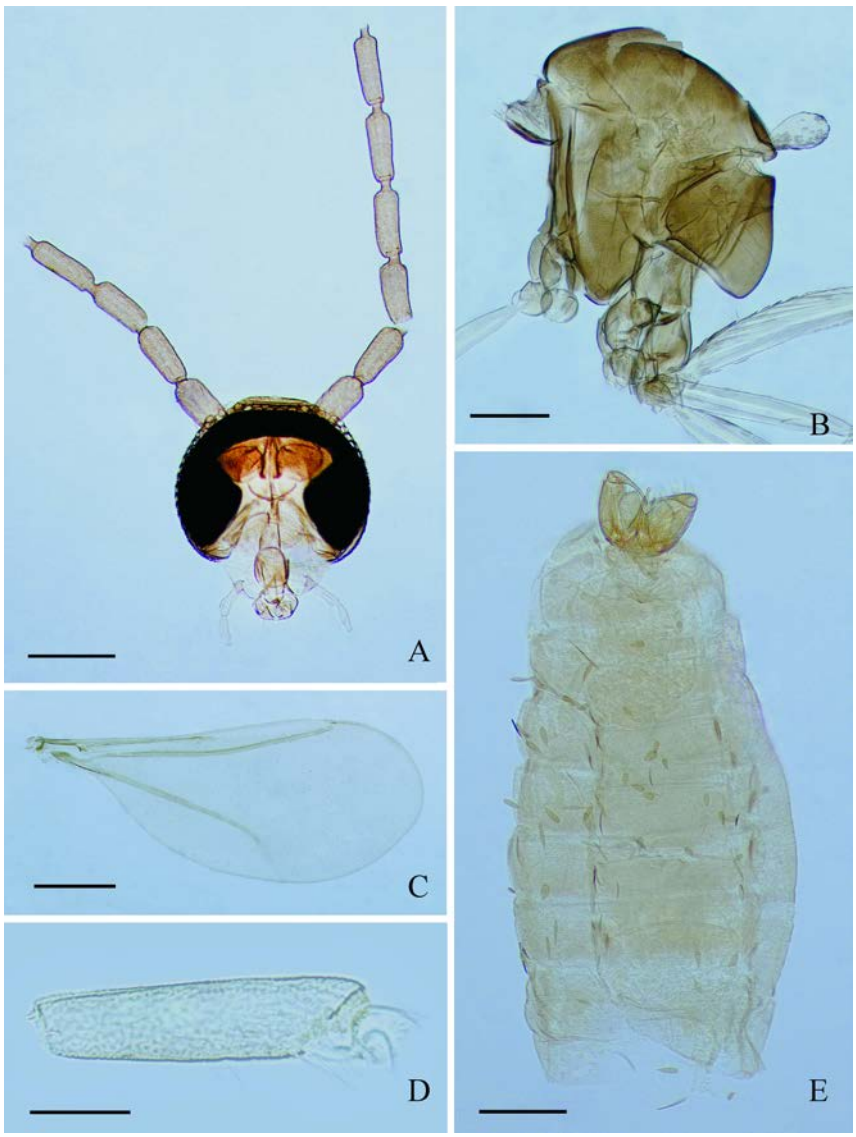

Figure 3. *Brachineura diplatypa* Jiao, Jin & Bu **sp. nov.** (Male holotype, NKUCecid. No. BBG001, photomontaged by Auto-Montage Essentials software). A. Head, anterior view; B. Thorax, wings and distal part of legs removed, lateral view; C. Wing, dorsoventral view; D. Fore fifth tarsomere with tarsal claw, lateral view; E. Abdomen, dorsal view. Scale bars = 100 μm (A, B, E); 200 μm (C); 25 μm (D).

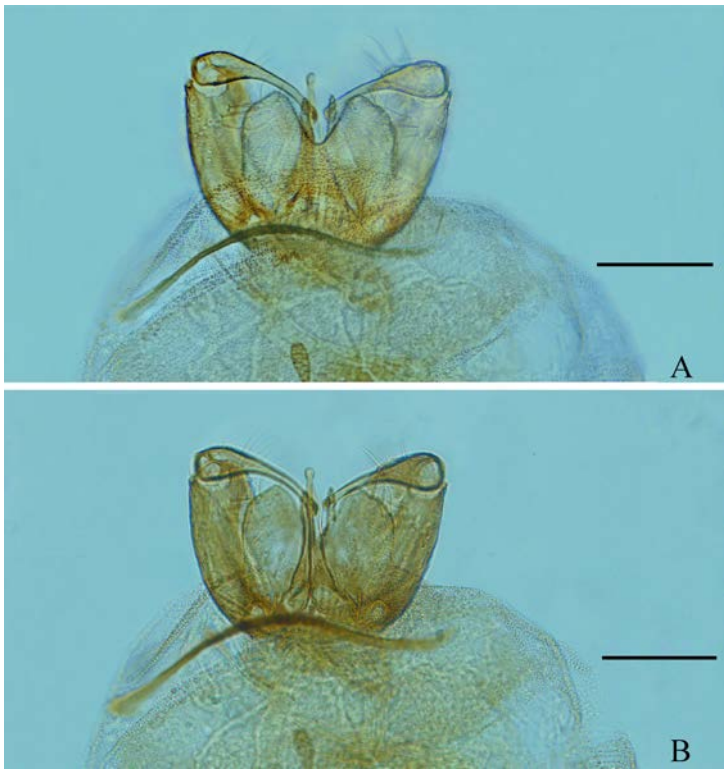

Figure 4. *Brachineura diplatypa* Jiao, Jin & Bu **sp. nov.** (Male holotype, NKUCecid. No. BBG001, photomontaged by Auto-Montage Essentials software). A, B. Genitalia and abdominal segments 7–8, dorsal and ventral views. Scale bars = 50 μm.

Female unknown.

Holotype. ♂, **China**, Heilongjiang, Shangzhi, Mao'er Mountain, Lüjiaweizi, 45.14°N, 127.57°E, 22-24-VII-2003, Jun LI leg., alt. 300 m, Malaise trap, NKUCecid. No. BBG001. **Paratype**. 1♂, same data as holotype, NKUCecid. No. BBG002.

Etymology. The specific epithet "*diplatypa*" refers to the unique sub-tapered aedeagus with the apex and the distal 1/3 both distinctly swollen.

Diagnosis. *Brachineura diplatypa* **sp. nov.** is characterized by the unique male aedeagus with the apex and the distal 1/3 both distinctly swollen. This new species is also distinguishable from the other congeners by the combination of the gonostylus with the broadened and aequilate basal 1/4, the slender, elongated and aequilate distal half, and the male seventh tergite normally shaped, not reduced to sclerotized and linear band

Remarks. Within the genus *Brachineura*, *B. diplatypa* **sp. nov.** is close to *B. ussurica* Fedotova, 2004 from Russian Far East with similar cerci, hypoproct and distal half of gonostylus, but can be easily distinguished by the uniqueness of the subdistally swollen aedeagus and the gonostylus with the aequilate basal 1/4. By contrast, *B. ussurica* possesses the subcolumnar aedeagus without any deformations or modifications and the gonostylus with an evenly tapered basal half.

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Nomenclatural acts

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