

A new species of *Rhizomyia* Kieffer (Diptera: Cecidomyiidae) from Northeast China

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Abstract: A new cecidomyiid species, *Rhizomyia acroleptosipha* **sp. nov.** collected from Ning'an in Heilongjiang Province of China, is described and illustrated as the first record of the mycophagous genus *Rhizomyia* Kieffer, 1898 from Northeast China. This new species is characterized by the unique bell-jar-shaped aedeagus with the basal 3/4 extremely broadened and the distal 1/4 constricted to be inverted-funnel-shaped. A new revised generic description is given to include this new species, and a key to all known species in China is provided.

Key words: Brachineurini; taxonomy; key

中国东北地区根瘿蚊属 *Rhizomyia* Kieffer 一新种记述（双翅目：瘿蚊科）

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摘要: 首次报道菌食性的根瘿蚊属 *Rhizomyia* Kieffer, 1898 在我国东北地区的分布, 记述采集于黑龙江省宁安的 1 新种: 端细管根瘿蚊 *Rhizomyia acroleptosipha* **sp. nov.**, 并对本属属征进行修订, 提供了中国该属分种检索表。该新种具独特的钟罩状阳茎, 其基部 3/4 部分极为宽阔而端部 1/4 部分收缩呈倒置漏斗状。

关键词: 短脉瘿蚊族; 分类; 检索表

Introduction

The mycophagous genus *Rhizomyia* Kieffer is the largest genus in the tribe Brachineurini since its erection in 1898. *Rhizomyia* is now comprised of 30 valid described species as recorded in the latest world catalog by Gagné & Jaschhof (2017), including two species previously reported by Jiao & Bu (2013), namely *R. leptodicrata* Jiao & Bu and *R. meniscata* Jiao & Bu, both distributed in South China. In Northeast China, a new species, *Rhizomyia acroleptosipha* **sp. nov.** was recently discovered from Huluwaizi, Jingbo Town, Ning'an County, Mudanjiang, Heilongjiang Province, China, which is also the first record of *Rhizomyia* in this region. In the present paper, this new species is described and illustrated with its

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diagnosis and comparison to other related congeners. And to include this new species, a revised generic description is given. A key to males of all known *Rhizomyia* species in China is first provided in this study.

Material and methods

Tiny adult midge specimens were preserved in 90% ethanol in the field immediately after collection. For morphological observation, all of these ethanol preserved specimens were dissected into four parts: head, thorax without wings, abdomen and wings, all of which were mounted on slides using Canada balsam. The morphological terminology follows Gagné (1981). The holotype and other type specimens are deposited in the Institute of Entomology, College of Life Sciences, Nankai University (NKUM), Tianjin, China. All figures in this article are based on the holotype of this new species (slide numbers NKUCecid. No. BBR001).

Taxonomy

Rhizomyia Kieffer, 1898

Rhizomyia Kieffer, 1898: 56. Type species: *Rhizomyia perplexa* Kieffer, 1898.

Coccomorpha Rübsaamen, 1899: 534. Type species: *Coccomorpha circumspinosus* Rübsaamen, 1899.

Revised Diagnosis. Fedotova (2014) gave the latest diagnosis of the genus *Rhizomyia*. In the present paper, the generic diagnosis is revised to show a more clear one in the tribe Brachineurini by the unique following combination of three characters: vein Cu forked; gonocoxite not having distal lobe and having mediobasal lobe only undeveloped being one to several setae; gonostylus normally shaped, without any modifications or lobes. The detailed distinctions between *Rhizomyia* and related genera had been discussed by Jiao *et al.* (2019) which included an updated key to all known genera in the tribe Brachineurini.

Redescription. Adult. Palpus fixed to be 3-segmented, third and second segments longer than first (Fig. 1A). Antenna: scape larger than pedicel, both densely covered with setae ventrally; flagellomeres fixed to be 10 in number, all uninodal (Fig. 1B) with prolonged neck and subcylindrical node except for the last one without a neck, first and second fused; each node with 2 mostly latitudinal, appressed, band-shaped circumfila, subapically and subbasally respectively linked by two similar longitudinal circumfila, and 2 whorls of long, strong, and irregular setae, one at the subbasal and one in the middle. Wing (Fig. 1C) hyaline, sparsely covered with narrow scales and setose; vein Sc weak, veins C, R₁ and R₅ strong; R₁ joining C before the half wing; R₅ bent slightly backward, joining C at wing apex; vein M missing; Cu forked, vein PCu approximately parallel with the base of Cu. Legs densely covered with narrow scales and sparse setae; all the tarsal claws (Fig. 1D) toothed with empodia upward curved and pulvilli cylindrical. Male seventh and eighth tergites respectively reduced to one strongly sclerotized and linear band. Male genitalia (Figs. 2A, B). gonocoxite not having distal lobe and having mediobasal lobe only undeveloped to be one to several setae; gonostylus normally shaped, without any modifications or lobes; cerci and hypoproct both distinctly emarginated forming two lobes; aedeagus normally tapered gradually from base to apex, or shaped variously, or having all kinds of modifications. Female ovipositor: short, not

retractable, with cerci separated to two short lobes.

Key to males of all known *Rhizomyia* species in China

1. Aedeagus with the apex only blunt, not emarginated.....*R. acroleptosipha* **sp. nov.**
- Aedeagus distinctly emarginated forming two particular prominences.....2
2. Aedeagus apically with two slender, prolonged and sharp prominences.....*R. leptodicrata* Jiao & Bu
- Aedeagus apically with two stubby, corneous and pointed prominences.....*R. meniscata* Jiao & Bu

Rhizomyia acroleptosipha Jiao, Zhou & Bu **sp. nov.** (Figs. 1, 2)

<http://zoobank.org/urn:lsid:zoobank.org:act:200AADFB-8B27-4050-BBE0-19B0AB6113D8>

Description. Body color yellow brown. Body length: 1.30–1.40 mm ($n = 3$). Wing length (measured from the base): 1.30–1.40 mm ($n = 3$). Wing width: 0.60–0.70 mm ($n = 3$).

Head (Figs. 1A, B). Eye bridge 6 facets long in the middle of vertex. Palpus sparsely setose, with three segments progressively longer (Fig. 1A). All flagellomeres with the node covered with a dozen of horseshoe-shaped alveoli in the middle and microtrichia elsewhere; 3rd male flagellomere (Fig. 1B) with the node 1.80–1.90 times as long as wide and the neck 3.20–3.30 times as long as wide, 0.64–0.65 times length of node.

Thorax (Figs. 1C, D). Wing (Fig. 1C) hyaline, 2.14–2.15 times as long as wide. R_1 joining C at basal 2/5; R_5 bent a little backward at distal 1/3, joining C at wing apex, with one pore at subdistal; Cu forked. Tarsal claws (Fig. 1D) toothed on all legs; empodium slightly shorter than tarsal claw; pulvillus cylindrical, shorter than 1/2 length of claw.

Abdomen. Each tergite and sternite densely covered uniformly with scales. First to sixth tergites developed to be stripe-shaped, with a single, posterior row of setae, with several pairs of lateral setae, and with one anterior of trichoid sensilla; first tergite much shorter than second one; sixth tergite additionally with a sclerotized, latitudinal and linear band close to anterior margin in the base; seventh and eighth tergites both reduced to one sclerotized, latitudinal and linear band; second to eighth sternites with one anterior pair of closely set trichoid sensilla; second sternite divided latitudinally into two bands, respectively with one single, anterior row of setae and one single, posterior row of setae; third to sixth sternites subrectangular with an irregular but mostly double, posterior row of setae, and covered with several scattered anterior and lateral setae; seventh sternite narrower than sixth, with an irregular but mostly double, posterior row of setae, and covered with relatively denser anterior and lateral setae and several scattered central setae; eighth sternite much smaller than seventh, and reduced to be subobtuse-isosceles-triangle-shaped, covered with an single, posterior row of setae and several anterior setae. Male genitalia (Fig. 2). Gonocoxite stout and distinctly swollen in the middle, having mediobasal lobes reduced with three sclerotized, glabrous and clustered setae; gonostylus slender, gradually arched and tapered from base to apex, approximately 9/10 length of gonocoxite, basal half covered with dense microtrichia, wholly with sparse short setae, and distally with a strongly sclerotized tooth; cerci moderately separated with a wide depression forming two rounded lobes with several long apical setae; hypoproct approximately as long as cerci, emarginated with a wider and shallower depression forming two broad lobes, each with several short setae; aedeagus distinctly shorter than gonocoxite, bell-jar-shaped with the basal 3/4 extremely broadened except for the basal 1/4 with concave at lateral margins and at distal 1/8 sharply constricted to be tubular forming an inverted-funnel shape from distal 1/4 to apex, a little wider at the tip. Tegment sclerotized, wholly present to be two-humped with the apex

emarginated widely forming two rounded lobes.

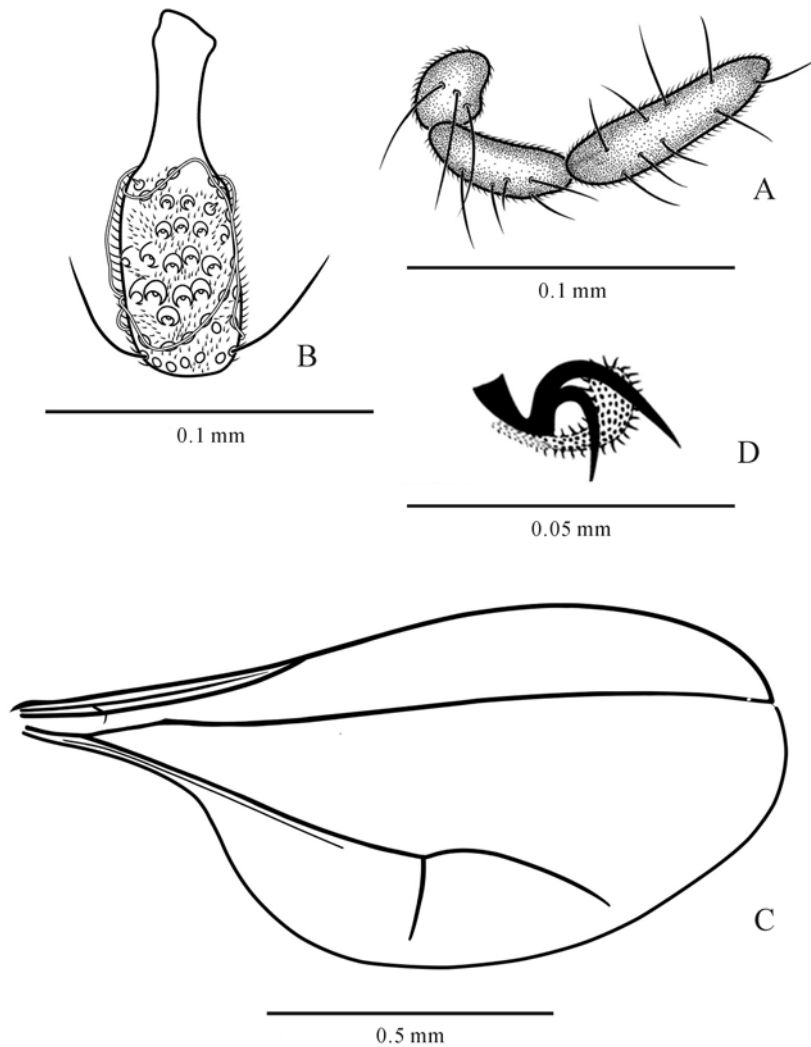


Figure 1. *Rhizomyia acroleptosipha* **sp. nov.** (Male holotype, NKUCecid. No. BBR001). A. Palpus, lateral view; B. Third flagellomere, ventral view; C. Wing, dorsoventral view; D. Fore tarsal claw with empodium and pulvillus, lateral view.

Female is unknown.

Holotype. ♂, **China**, Heilongjiang Province, Mudanjiang, Ning'an County, Jingbo Town, Huluwaizi, 43.48°N, 128.55°E, 19-VII-2001, Jun LI & Yüxia JIANG leg., altitude 500 m, NKUCecid. No. BBR001. **Paratypes.** 2♂, same data as holotype, NKUCecid. No. BBR002-003. All type specimens deposited in NKUM.

Diagnosis. This new species *Rhizomyia acroleptosipha* **sp. nov.** is characterized by the unique bell-jar-shaped aedeagus with the basal 3/4 extremely broadened and the distal 1/8

constricted to be tubular.

Distribution. East Asia (Northeast China: Heilongjiang).

Etymology. The specific epithet *acroleptosipha* is an adjective in feminine genitive case that means “thin and tubular at the apex” in Latin of Greek origin, referring to the unique bell-jar-shaped aedeagus with the apex constricted to be thin columnar.

Discussion. In the genus *Rhizomyia*, the male *R. acroleptosipha* **sp. nov.** can be identified by the uniqueness of the bell-jar-shaped aedeagus. The new species is also distinguishable from the other congeners by the combination of aedeagus with the basal 3/4 obviously broadened and gonocoxite with the middle so swollen to be three times as wide as the base of gonostylus. And *Rhizomyia vittata* Mamaev, 1967 distributed in Moscow Province of Russia is the closest to this new species with the similar gonostylus and aedeagus tip, but differs from this new species by its hypoproct emarginated with a deep depression forming two digitiform lobes and gonocoxite normally shaped. In *R. acroleptosipha* **sp. nov.**, the hypoproct is emarginated with a wider and shallower depression forming two broad lobes, and the gonocoxite is distinctly swollen in the middle.

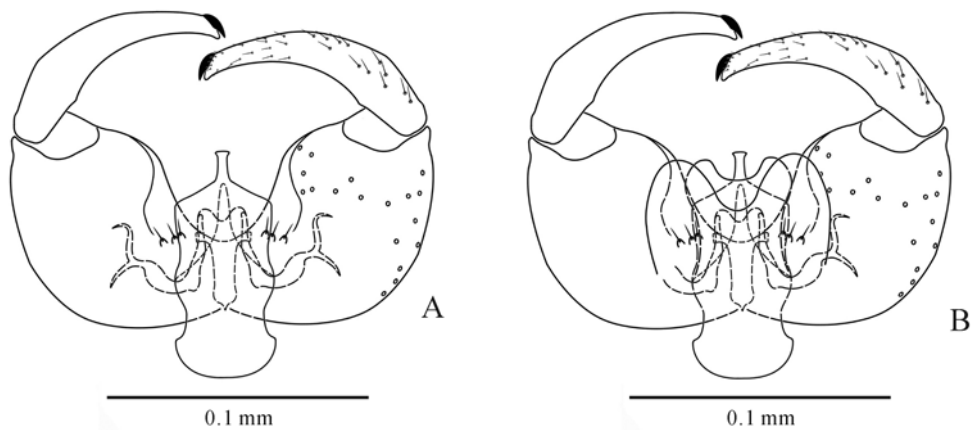


Figure 2. *Rhizomyia acroleptosipha* **sp. nov.** (Male holotype, NKUCecid. No. BBR001). A. Genitalia, cerci, hypoproct and the setae on left gonopod removed, dorsal view; B. Genitalia, the setae on cerci, hypoproct and left gonopod removed, dorsal view.

Previously, the genus *Rhizomyia* in China was only known in tropical and subtropical areas based on the two species, *R. leptodicrata* and *R. meniscata* by Jiao & Bu (2013). This new species now extends this genus into the middle temperate zone of China as well as in Asia and is the first record in Northeast China. Worldwide, this genus seems to have more Palaearctic members with 28 species including the new species, in contrast to containing only 3 Oriental ones in South China and India (Gagné & Jaschhof 2017). However, we cannot yet speculate on the routes by which this genus spread from a cold Palaearctic region to a warmer Oriental range in the Old World. Therefore, the only way to find answers is to enlarge the narrowly distributed range data in China, the only country possessing both the Palaearctic and Oriental regions, by performing further extensive faunistic surveys.

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Nomenclatural acts

The ZooBank Life Science Identifier (LSID) for this publication is: <http://zoobank.org/urn:lsid:zoobank.org:pub:428AA291-11A9-44BD-B99B-F142BE93457D>.

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