

*This contribution is published
to honor Dr. Amnon Freidberg,
a scientist, a colleague and a friend,
on the occasion of his 75th birthday.*

The genus *Cephalodromia* (Diptera: Mythicomyiidae) in China

NEAL L. EVENHUIS

*J. Linsley Gressitt Center for Research in Entomology, Bernice Pauahi Bishop Museum,
1525 Bernice Street, Honolulu, Hawai'i 96817-2704, USA. E-mail: NealE@bishopmuseum.org*

ABSTRACT

One new species of *Cephalodromia* Becker from northeastern China, *C. freidbergi* n. sp., is described and illustrated. *Cephalodromia gobica* (Zaitzev) is newly recorded from China. The latter species and *Cephalodromia seia* (Séguy) are redescribed based on collections made by Amnon Freidberg and Fini Kaplan. A lectotype is designated for *Cyrtosia seia* Séguy (now *Cephalodromia*). With the new species described here, there are now three species of *Cephalodromia* known from China and 22 species of the genus known worldwide. A key to species occurring in China and Mongolia is given.

KEYWORDS: Diptera, Mythicomyiidae, *Cephalodromia*, micro bee-flies, China, Palaearctic, Émile Licent, identification key, taxonomy.

摘要

本文对采自中国东北的头麦蜂虻属 1 新种弗氏头麦蜂虻(*Cephalodromia freidbergi*) 进行了描述和绘图, 并记述了 1 中国新记录种戈壁头麦蜂虻(*Cephalodromia gobica*)。基于 Freidberg 和 Kaplan 建立的标本收藏, 对戈壁头麦蜂虻(*Cephalodromia gobica*) 和广东头麦蜂虻(*Cephalodromia seia*) 进行了重新描述, 并指定了广东头麦蜂虻(*Cyrtosia seia* Séguy) (现为 *Cephalodromia* 属) 的选定模式标本。包括本文记述的新种在内, 目前头麦蜂虻属已知种类中国有 3 种, 全球共有 22 种。本文还提供了中国和蒙古的头麦蜂虻的分种检索表。

关键词: 双翅目, 麦蜂虻科, 中国, 古北区, 头麦蜂虻属, 分类检索表, 分类学。

INTRODUCTION

Cephalodromia is found primarily in Africa, Eurasia and the Mediterranean, with a few species extending into the eastern Palaearctic Region and south Asia in the Oriental Region (Evenhuis 2010). The genus is fairly commonly collected in the Mediterranean and Africa, but it is rather rare in China. The only previous description of a species from China was by Séguy (1963) of *Cephalodromia seia*, collected in August 1930 by the Jesuit priest Émile Licent (1876–1952) in ‘Paita’, Hebei Province, China [incorrectly listed as from southern China in Evenhuis (2010)]. Collections of *Cephalodromia* made in 1993 by Amnon Freidberg and Fini Kaplan examined in this study comprise three species: *Cephalodromia seia* (Séguy), *Cephalodromia gobica* (Zaitzev) [previously known only from Mongolia;

a new record for China]; and the new species *Cephalodromia freidbergi* n. sp. There are now three species recorded from China; and 22 species known in the genus worldwide.

MATERIALS AND METHODS

Material derives from collections made by Amnon Freidberg and Fini Kaplan in China, and is deposited in the Steinhard Museum of Natural History, Tel Aviv University (Tel Aviv, Israel; SMNHTAU). Other specimens in this study were examined in or are deposited in the following: BPBM (Bernice Pauahi Bishop Museum, Honolulu, Hawai‘i, USA), MNHN (Muséum National d’Histoire Naturelle, Paris, France), and ZIS (Zoological Institute, Academy of Sciences of Russia, St. Petersburg).

Confocal images of various morphological structures were accomplished by using a Leica M165C stereo dissecting scope via the Leica Microsystems LAS Multifocus software (v. 4.12.0) and using Zerene Stacker® software (v. 1.04) (Zerene Systems, LLC, Richmond, Washington, USA) to align and stack-focus each final image. Morphological terminology follows Cumming & Wood (2017).

TAXONOMY

Genus *Cephalodromia* Becker, 1914

Cephalodromia: Becker 1914: 121. Type species: *Cephalodromia curvata* Becker, 1914, by monotypy.

Ceratolaemus Hesse, 1938: 969 (as subgenus of *Platypygyus* Loew). Type species: *Platypygyus xanthogrammus* Hesse, 1938, by original designation.

The genus is very similar to *Cyrtosia* Perris in overall body shape and wing venation (open cell dm), but can be separated from it by the characteristic and distinctly produced lower occiput resulting from a either a ventral sulcus or ridge from the oral margin extending posteriorly below the eyes. With the new species described here, the genus is now comprised of 22 species worldwide.

Key to species of *Cephalodromia* from China and Mongolia

- 1 Legs predominantly black, coxae dark brown to black; halter knob brown dorsally (China, Mongolia) ***gobica***
- Legs yellow to yellowish brown, tarsi darker; coxae yellowish brown to yellow; halter knob all yellow to white (China) 2
- 2 Anterior portion of mesonotum with yellow interhumeral marks coalesced with humeral callus marking (Fig. 4); frons with yellow laterally at inner eye margins; metakatepisternum yellow; abdominal terga with complete white fascia posteriorly; costal cell hyaline apically ***seia***
- Anterior portion of mesonotum with yellow interhumeral marks separate from humeral callus markings (Fig. 3); frons all black, without yellow at inner eye margins; metakatepisternum black; white abdominal tergal fascia incomplete, interrupted medially; costal cell milky white apically ***freidbergi*** n. sp.

Cephalodromia freidbergi n. sp.

(Figs 1, 3)

LSID: urn:lsid:zoobank.org:act:79C3336A-32D8-45CD-94B4-A9DC63789142.**Etymology:** The species is named in honor of Amnon Freidberg (see Remarks).**Diagnosis:** This species can be separated from its congeners in China by the incomplete yellow crossbands on the posterior tergites of abdomen (crossbands complete in *C. gobica* and *C. seia*) and the interhumeral marks not coalesced with the yellow of the humeral callus (coalesced in *C. gobica* and *C. seia*); from *C. gobica* it is additionally separated by the yellow epandrium (black in *C. gobica*) and yellowish brown legs (black in *C. gobica*).**Description:** Lengths. Body: 1.5–1.7, wing: 2.2–2.5 mm.*Male.* Head. Shining black, pruinose only on posteromedial portion of occiput; occiput and vertex with short appressed yellowish brown hairs; eyes dichoptic, separated at vertex by $1.3\times$ distance between lateral ocelli; antennae black; scape small, cylindrical, length subequal to width; pedicel cylindrical, slightly wider than**Fig. 1:** *Cephalodromia freidbergi* n. sp., male, lateral habitus.

long, slightly flared apically; first flagellomere linear-ellipsoid, length about $2.3\times$ greatest width; second flagellomere with minute hairs laterally and apically, about $\frac{1}{3}$ length of first, with long, thin apical style; venter of head black, extended posteriorly as single medial ridge; proboscis black, tubular, length *ca* $2.3\times$ head height; labrum $\frac{2}{3}$ length of proboscis.

Thorax. Mesonotum shining black with yellow patterning, with scattered admixture of white and bronzy hairs dorsally, white hairs laterally; yellow on following: humeral callus, notopleural line to postalar callus, interrupted at transverse suture, interhumeral marks lozenge-shaped, separate laterally from humeral callus marking (Fig. 3); scutellum yellow with brown spot basomedially; pleura with propleuron and anepisternum shining, remaining pleura pruinose; propleuron yellow, anepisternum black with yellow only at posteroventral corner, katepisternum and meron yellow above, dark brown to black below; katepimeron yellow; anepimeron and katatergite black with yellow dorsally; halter stem yellow, knob white.

Legs. Yellowish brown; tarsi brown; claws black.

Wing. Hyaline, slightly smoky at extreme apex; veins yellowish brown; costa ends midway between end of R_{4+5} and M_1 ; costal cell milky opaque on apical third; vein Sc incomplete, ending at level about equal to origin of vein R_{2+3} ; R_{2+3} slightly upcurved apically, ending in costa equidistant between end of R_1 and end of R_{4+5} ; R_{4+5} slightly downcurved to wing margin on apical third; anal cell open in wing margin by width subequal in length to crossvein r-m; fringe of hair on posterior margin of wing minute.

Abdomen. Dorsum black with scattered yellowish brown hairs; tergite II with yellow posterior laterally; tergites II-VI with weakly defined yellow fascia posteriorly; remaining segments black; sternites dark brown to black.

Genitalia (not dissected). Epandrium yellow; gonocoxa black.

Female. Lengths. Body: 2.0–2.2 mm, wing: 2.5–2.8 mm. As in male except: generally darker in thoracic and abdominal patterning, with yellow markings present, but not as contrasting as in male. Genitalia not dissected.

Holotype: ♂ **China:** Beijing Province, Badaling, Great Wall [40.359731°N 116.020014°E], 600 m, 1.x.1993, A. Freidberg & F. Kaplan (SMNHNTAU).

Paratypes: 2♀ same data as holotype (SMNHNTAU).

Remarks: In June 1995, I traveled to Beijing for the 18th Pacific Science Congress. One of the post-congress tours was a trip north of Beijing to the Ming Tombs and the Great Wall. When we were returning to our busses at the Great Wall, I spotted specimens of a species of *Cephalodromia* (probably this one) hovering over flowers of an undetermined white Asteraceae and then ‘dropping’ onto them to feed. Frustrated I did not have anything with which to collect, I was forced to finally leave the area to meet our busses that were returning us back to our hotel in Beijing. I was upset at missing out on a rare opportunity (traveling to China *and* seeing Mythicomyiidae on the hoof as it were!) but eventually just chalked the event up to bad timing; however, I knew I was still fortunate to have seen specimens in

China of a genus I had previously only known from reading Séguy's (1963) paper. Sometime later I told Amnon Freidberg about my bad luck in not being able to collect the specimens and he said not to worry; that he was pretty sure he had gotten them for me when he was there two years earlier and would check. A few years later, I had forgotten my lament to Amnon, and was pleasantly surprised when a package arrived with the specimens he promised! It is a pleasure to be able to thank him by naming this new species in his honor.

Cephalodromia gobica (Zaitzev, 1972)

Cyrtosia gobica: Zaitzev 1972: 854. (Type locality: Mongolia: [SW Gobi], Arts Bogdo, 20 km S Hovd). Holotype ♂ in ZIS.

Cephalodromia gobica (Zaitzev): Evenhuis 2010: 20.

Diagnosis: This species can be separated from the congeners in China by the predominantly black legs (predominantly yellowish brown in *C. freidbergi* and *C. seia*). From *C. freidbergi* it is also separated in males by the black epandrium (yellow in *C. freidbergi*).

Redescription: Lengths. Body: 1.5, wing: 2.0 mm.

Male. Head. Shining black, occiput and vertex with sparse short appressed brown hairs; eyes dichoptic, separated at vertex by 1.3× distance between lateral ocelli; antennae broken off and missing; venter of head black, extended posteriorly as single medial ridge; proboscis black, tubular, length *ca* 2× head height; labrum $\frac{3}{5}$ length of proboscis.

Thorax. Mesonotum subshining black with dusky yellowish patterning, with scattered sparse white hairs dorsally, laterally, and posteriorly, disc predominantly bare, slight pruinosity medially; yellowish brown on following: interhumeral mark and humeral callus (coalesced), notopleural line to postalar callus, broadly interrupted at transverse suture; scutellum yellowish brown with brown spot basomedially; pleura with propleuron and anepisternum shining, remaining pleura pruinose; propleuron yellowish brown, anepisternum black with yellow anteriorly and centrally, katepisternum and meron yellow above, dark brown to black below; katepimeron yellow; anepimeron and katatergite black with yellow dorsally; halter stem yellow, knob white with brown dorsally.

Legs. Coxae black; femora black, yellow apically; fore tibia yellow; mid and hind tibiae black; tarsi and claws black.

Wing. Hyaline, slightly smoky apically; veins brown; costa ends $\frac{1}{3}$ way beyond end of R_{4+5} to M_1 ; costal cell hyaline; vein Sc incomplete, ending at level about equal to origin of vein R_{2+3} ; R_{2+3} slightly upcurved apically, ending in costa $\frac{3}{5}$ way beyond end of R_1 to R_{4+5} ; R_{4+5} slightly downcurved to wing margin on apical third; anal cell open in wing margin by width subequal in length to crossvein r-m; fringe of hair on posterior margin of wing minute.

Abdomen. Dorsum black, scattered yellowish white hairs on tergites IV–VI; tergites with yellow fascia posteriorly; sternites dark brown to black.

Genitalia (not dissected). Epandrium and gonocoxa black.

Material examined: China: 1♂ Ming Tombs, 40 km N Beijing, 1.x.1993, A. Freidberg & F. Kaplan (SMNH-TAU).

Cephalodromia seia (Séguy, 1963)

(Figs 2, 4)

Cyrtosia seia: Séguy 1963: 253. (Type locality: "Païta" [= Baitazhen village, Shahe, Hebei Province, 36.878603°N 114.303034°E]). Lectotype ♀ (designated herein, see below) in MNHN.

Cephalodromia seia (Séguy): Evenhuis 2010: 21.

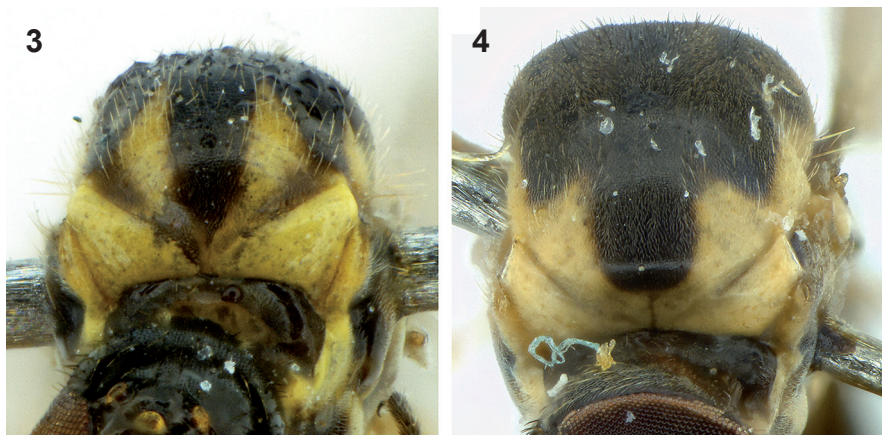
Diagnosis: This species can be separated from *C. gobica* in China by the all yellow legs (predominantly black in *C. gobica*). It is easily separated from *C. freidbergi* by the yellow interhumeral marks coalesced with the yellow humeral marks (not coalesced in *C. freidbergi*) and by the broad complete white transverse posterior abdominal tergal crossbands (these crossbands thin and broadly interrupted medially in *C. freidbergi*).

Redescription: Lengths. Body: 1.8, wing: 2.8 mm.

Female. Head. Vertex and occiput subshining black; frons black with thin yellow stripe at inner eye margin, extending from antennal base but not reaching vertex; faced yellowish brown; occiput and vertex with short appressed grayish white hairs; eyes dichoptic, separated at vertex by 1.3× distance between lateral ocelli; antennae



Fig. 2: *Cephalodromia seia* (Séguy), female, lateral habitus.



Figs 3, 4: Mesonotum, anterior view: (3) *Cephalodromia freidbergi* n. sp., (4) *C. seia* (Séguy).

black; scape small, cylindrical, length subequal to width; pedicel cylindrical, slightly wider than long, slightly flared apically; first flagellomere subconical, length about $1.5\times$ greatest width; second flagellomere with minute hairs laterally and apically, about $\frac{2}{3}$ length of first, with short, stubby apical style; postgena brown, venter of head extended posteriorly as single medial ridge; proboscis black, tubular, length *ca* $2\times$ head height; labrum $\frac{1}{5}$ length of proboscis.

Thorax. Mesonotum subshining black with yellow patterning, with scattered admixture of grayish white and black hairs dorsally and laterally; yellow color on following: interhumeral mark and humeral callus (coalesced) (Fig. 4), notopleural line to postalar callus, indented dorsally in supra-alar area; scutellum yellow with brown spot basomedially; pleura with upper shining, lower pleura pruinose; propleuron and anepisternum predominantly yellow, black anteroventrally, katepisternum and meron yellow above, dark brown to black below; katepimeron yellow; anepimeron and katatergite black with yellow dorsally; metakatepisternum yellow; halter stem and knob yellow.

Legs. Yellow; tarsi yellowish brown; claws black.

Wing. Hyaline; veins yellowish brown; costa ends midway between end of R_{4+5} and M_1 ; costal cell hyaline; vein Sc incomplete, ending at level about equal to origin of vein R_{2+3} ; R_{2+3} slightly upcurved apically, ending in costa equidistant between end of R_1 and end of R_{4+5} ; R_{4+5} slightly downcurved to wing margin on apical $\frac{1}{3}$; anal cell open in wing margin by width subequal in length to crossvein $r-m$; fringe of hair on posterior margin of wing minute.

Abdomen. Dorsum black with scattered yellowish hairs; all tergites with broad yellow fascia posteriorly; sternites dark brown to black. Genitalia not dissected.

Material examined: China: 1♀ Ming Tombs, 40 km N Beijing, 1.x.1993, A. Freidberg & F. Kaplan (TAU); 5 syntypes (as regards designation of the lectotype (Fig. 5), see below under Remarks) [Hebei Prov.], Paita, 13–14.viii.1930, É. Licent (MNHN).

Remarks: The species is represented in MNHN by five syntypes (3♂, 2♀) that were collected in ‘Paita’ [elev. 1000–1100 m] [= current Baitazhen village], Shahe district, southern Hebei Province, by Père Émile Licent, S.J. on 13 and 14 August 1930. The best preserved of these syntypes, a female (Fig. 5), is designated here as lectotype. It is double-mounted with a pin onto a stage and is in fair condition with the apical half of the proboscis broken off and left wing torn and folded alongside and slightly underneath the specimen. It carries the label “Paita” / “13·VIII·30”. It is the only specimen of the type series that is pinned. The other four are each glued on their side onto separately pinned celluloid squares.

An avid naturalist since childhood, Licent joined the Jesuits because he was not keen on proselytizing to “the flock”, but instead wanted to pursue his naturalist interests. After graduating with a PhD and spending two years at the British Museum (Natural History), he was posted to China (Cuenot 1966). He was there from 1914–1939 and spent those years collecting throughout northern China, doing primarily archaeological work in the first 10 years, but also collecting many plants and animals during that time and subsequently. To house his collections, he built

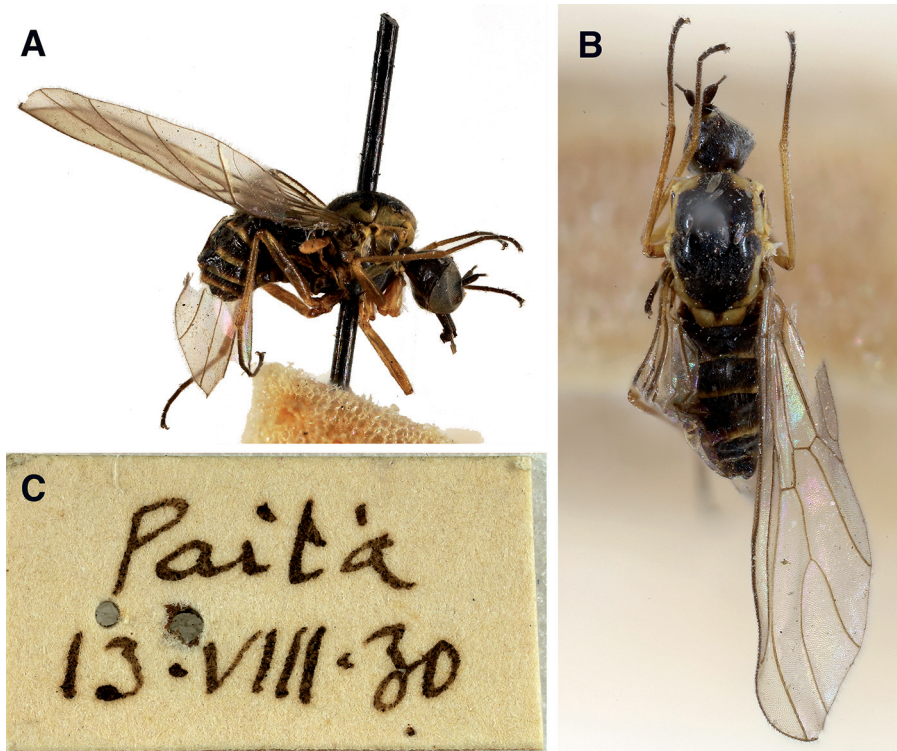


Fig. 5: Lectotype female of *Cephalodromia seia* (Séguy) in MNHN, lateral habitus (A), dorsal habitus (B), and label (C).

the Musée Hoang ho-Pai ho in Tianjin (later renamed the Tianjin Natural History Museum; it is now a protected heritage site). Some 20,000 of his collected specimens were housed there. Other of his specimens were deposited in museums in Europe. After returning to France at the start of WWII, he worked with Eugène Séguy at the MNHN where the types of some his collected Diptera are deposited. In the biography of Licent by Cuenot (1966), Séguy wrote in remembrance of him “C’était un excellent entomologiste” and that the laboratory at MNHN had only good memories of him.

ACKNOWLEDGEMENTS

This paper is dedicated to Amnon Freidberg, an indefatigable collector, whose friendship I have enjoyed and valued for many decades. He has collected Diptera worldwide and generously sent specimens to me for study, many of which are new to science. It is more than fitting that an uncommonly collected genus in China have a species named for him and a paper on them dedicated to him as well. Christophe Daugeron (MNHN) kindly searched for the syntypes and provided photographs of each.

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