A newly recorded genus *Clusiodes* Coquillett (Diptera: Clusiidae) and a new species from China

Kai LI[1,2,3], Jiale GAO[1,2,3], Chang LIU[1,2,3], Xinming YIN[1,2,3], Yuqiang XI [1,2,3①]

1. *College of Plant Protection, Henan Agricultural University, Zhengzhou, Henan 450002, China*

2. *Henan International Laboratory for Green Pest Control, Zhengzhou, Henan 450002, China*

3. *Henan Engineering Laboratory of Pest Biological Control, Zhengzhou, Henan 450002, China*

Abstract: One newly-recorded species of *Clusiodes* from China is reported and one new species, *Clusiodes sichuanensis* **sp. nov.**, is described with photos and illustrations. An updated key to the species of *Clusiodes* from China is provided.

Key words: Clusiodinae; taxonomy; key

中国新记录属类腐木蝇属 *Clusiodes* 及一新种记述（双翅目：腐木蝇科）

李凯 [1,2,3]，高嘉乐 [1,2,3]，刘畅 [1,2,3]，尹新明 [1,2,3]，席玉强 [1,2,3①]

1. 河南农业大学，植物保护学院，河南 郑州 450002；2. 河南省害虫绿色防控国际联合实验室，河南 郑州 450002；3. 河南省害虫生物防控工程实验室，河南 郑州 450002

摘要：报道中国新记录属类腐木蝇属和 1 中国新记录种：圆盘类腐木蝇，*Clusiodes discostylus* Sueyoshi，2006；记述 1 新种：四川类腐木蝇 *Clusiodes sichuanensis* **sp. nov.**，并提供了照片和特征图。编制了中国类腐木蝇属 *Clusiodes* 分种检索表。

关键词：腐木蝇亚科；分类；检索表

Introduction

Members of the family Clusiidae (Diptera: Acalyptratae) are commonly called druid flies. There are three subfamilies known worldwide, with 14 genera and at least 640 species (Lonsdale 2017; Yang *et al*. 2024).

The genus *Clusiodes* Coquillett, 1904 belongs to the subfamily Clusiodinae. It is a smaller group with 33 described species of *Clusiodes* distributed worldwide. Seventeen species are distributed in the Palaearctic and Oriental regions (Fallén 1823; Coquillett 1904; Frey 1960; Lonsdale & Marshall 2007). One species is known from China: *Clusiodes discostylus* Sueyoshi, 2006.

The adults of Clusiidae like to eat nectar, decaying wood, plant tissue, sap, bird and mammalian faeces, etc. (Soos 1987). Clusiidae insects are one of the few acalyptrata species to form a courtship site. Adults choose rotten wood suitable for an oviposition site before

Accepted 6 March 2025. Published online 25 August 2025.

① Corresponding author, E-mail: yuqiangxi2012@126.com

mating (Lonsdale & Marshall 2012). Males of almost the same size will gain "territory" through competition (Caloren & Marshall 1998). Some species of *Clusiodes* have significantly enlarged heads which may be used in mutual combat between males (Marshall 2000).

The main identification characteristics of this genus are as follows: Body length 2.6–5.8 mm, body color mainly brown to black, bristle brown or black. Arista with hairs shorter than width of central filament; pedicel outer triangular extension obtuse. 2 to 3 reclinate fronto-orbital bristles (anterior and posterior bristles short, posterior bristle sometimes absent). 2 reclinate orbital bristles; 1 interfrontal bristles; 2 subgenal bristles. Pedicel with 1 outstanding bristle on dorsal and ventral margins. 2–3 dorsocentral bristles; 1 long pair of cruciate apical and two (occasionally one) pairs of lateral scutellar bristles; 1 postpronotal, 2 notopleural, 2 postsutural intra-alar and 1 small intra post-alar bristle (sometimes minute). 1 strong anepisternal and 1 katepisternal bristle. Mid and hind tibiae each with 2 pairs of dorsal subapical bristles (inner bristle shorter). Male abdomen: Epandrium dome-shaped, setose and relatively broad and short. Cerci fused into subanal plate, tapering and approximately half length of epandrium; apical emargination minute to deep. Surstylus broad, parallel (or angled inwards). Phallapodeme fin-like. Hypandrium broad, ring-shaped and fused to phallapodeme dorsally by complete membranous collar; fused to base of pregonite; four to five bristles, usually arranged in two ventrolateral clusters. Pregonite thin, elongate (subequal in length to hypandrium) and perpendicular to hypandrium; minutely setulose medially and distally. Postgonite and epiphallus absent. Basiphallus and distiphallus fused; basal section elongate, sclerotized, and approximately as long as pregonite (sometimes quite elongate and strongly curved); distal section, if present, sac-like and membranous. Ejaculatory apodeme long, slender and (usually) bent medially (Lonsdalec & Marshall 2007).

Clusiodes was found for the first time in the investigation of Clusiidae in China. One new species is described from Sichuan Wanglang National Nature Reserve: *Clusiodes sichuanensis* **sp. nov.** Located in the southwest of China, Sichuan belongs to the Oriental region and has lush vegetation, high species richness, and especially abundant insect resources.

Material and methods

Genitalia preparations were made by removing and macerating the apical portion of the abdomen in glacial acetic acid, then rinsing in distilled water before storage in glycerin-filled microvials. Specimens were examined and photographed using a Leica M205A microscope. After examination, genitalia were transferred to fresh glycerin and stored in a microvial on the pin below the specimen, or moved to an ethanol tube together with the wet specimens. Image plates were post-processed with Adobe PHOTOSHOP CC 2019 Extended.

Specimens examined were deposited in the Entomological Museum of Henan Agricultural University (HAU), Zhengzhou. Terminology follows Lonsdale and Marshall (2006). The M_1 ratio is defined as the length of the ultimate section of wing vein M divided by the length of the penultimate section (Lonsdale & Marshall 2006).

Taxonomy

Key to species of *Clusiodes* from China

1. Thorax with 1 longitudinal stripe on both sides, pronotum extending to scutellum; pronotum dark brown at anterior; 2 “long oval” spots in the middle, the rest dark yellow; 1 lateral scutellar bristle; postgonite triangular, with 4 bristles, postgonites and basiphallus equal in length ····· *C. discostylus* Sueyoshi
-. Thorax yellow; 3 small lateral scutellar bristles; surstylus split into 3, with more than 40 small spines at the distal end; hypandrium with 2 setae ····· *C. sichuanensis* **sp. nov.**

1. ***Clusiodes sichuanensis* sp. nov.** (Fig. 1)

Description. Male. Body length 4.1–4.3 mm, wing (Fig. 1B) 3.8–4.0 mm.

Body mostly yellow and brown. Head (Fig. 1A) mostly yellow; palpus yellow; face yellowish in front, back yellow. 3 fronto-orbital bristles, posterior bristles small; 1 interfrontal bristle; back of the occiput yellow in the middle, dark brown on both sides, and the back of the head with sparse yellow small setae; gena mostly yellowish, more than 1/4 height of eye; antenna yellowish, arista sparse short plumose, gradually from shallow to deep from the base to the end; 1 ocellar bristle and 1 postocellar bristle.

Thorax and scutellum yellow; anepisternum yellow with brown spots at superior margin, remaining part yellow; katepisternum yellow; prescutellar bristle absent; 1 postpronotal bristle, 2 notopleural bristles, 1 postsutural supra-alar bristle, 0+3 dorsocentral bristles, dark brown, anterior bristle small; intra-alar bristle absent, 2 postalar bristles, dark brown, the posterior bristle tiny; 3 small lateral scutellar bristles, 1 apical scutellar bristle, strong and dark brown; 1 anepisteral seta, 1 katepisternal seta. Legs light yellow. Wing (Fig. 1B) with brown spots on distal 1/4, along veins R_{2+3}; light yellow in the front, dark brown in the back, the M_1 ratio 5.3; halter white.

Abdomen dark brown, bristles and setae dark brown. Male genitalia: epandrium height is 1.5 times the width. Cerci small, separate, “W”-shaped, 1.3 times as high as wide. Surstylus (Figs 1C, 1D), 1/2 length of genitalia, split into 3, with more than 40 small spines at the apex. Pregonite without bristles at the apex. Hypandrium with 2 setae; distiphallus (Figs 1E, 1F) long, membranous.

Female. Unknown.

Holotype. ♂, **China**, Sichuan, Pingwu, Wanglang, 2,480 m, 30-VII-2017, Yuqiang XI. **Paratypes.** 2♂, Sichuan, Pingwu, Wanglang, 2,320 m, 31-VII-2017, Yuqiang XI.

Etymology. The specific epithet “sichuanensis” refers to the type locality, Sichuan in China.

Diagnosis. Thorax and scutellum yellow; anepisternum yellow with brown spots at superior margin; 3 small lateral scutellar bristles; cerci small, separate, “W”-shaped; hypandrium with 2 setae.

Remarks. This new species is similar to *Clusiodes tobi* Sueyoshi, but can be separated by the ocullar triangle and face without silver soft setae; intra-alar bristle absent. In *C. tobi* Sueyoshi, the ocullar triangle and face with silver soft setae; intra-alar bristle present (Sueyoshi 2006).

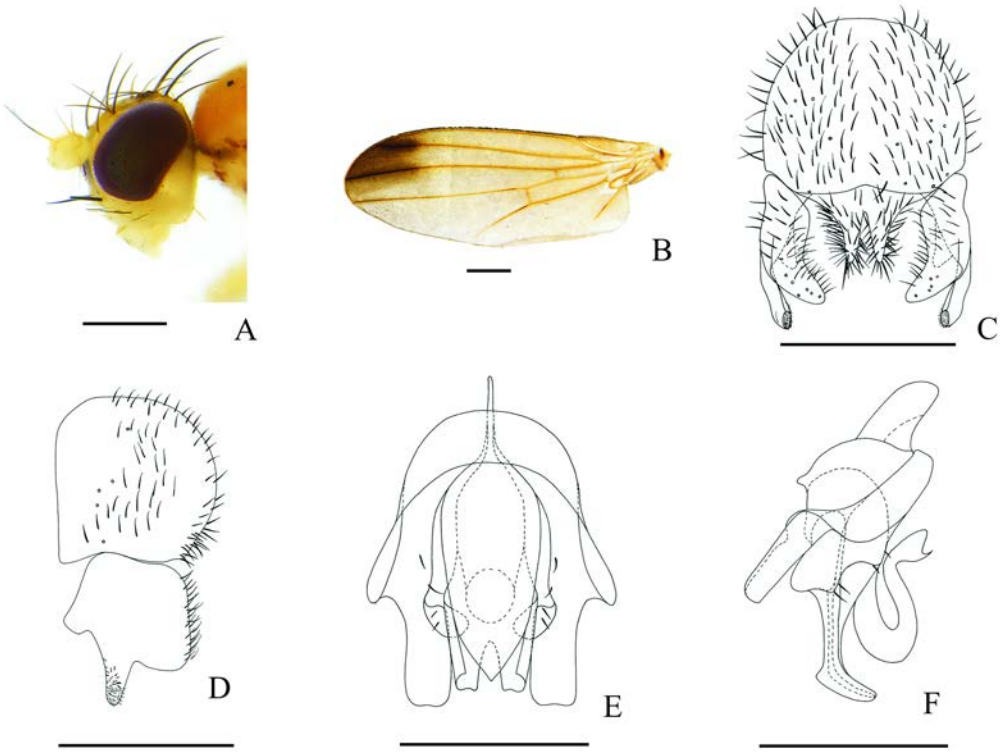

Figure 1. *Clusiodes sichuanensis* **sp. nov.**, ♂. A. Head, lateral view; B. Wing; C, D. Epandrium, cerci, and surstylus, posterior and lateral views; E, F. Hypandrial complex, ventral and lateral views. Scale bars = 0.5 mm (A, B); 0.1 mm (C–F).

2. ***Clusiodes discostylus* Sueyoshi** (Fig. 2)

Hendelia beckeri. Misidentification in part. Sueyoshi *et al*. 2003: 182.

Clusiodes discostylus Sueyoshi, 2006: 7.

Description. Male. Body mostly yellow to dark brown. Body length 3.9–4.0 mm, Wing (Fig. 2B) length 3.3–3.8 mm.

Head (Fig. 2A) mostly dark yellow; maxillary palpus yellow; face dark yellow; 3 parafrontal bristles, posterior bristles small; occiput dark brown, sparse dark brown small bristles sparse; gena yellow, more than 1/7 height of eye; one ocellar bristle, one post-ocellar bristle; one inter-frontal bristle; antenna dark yellow, arista brown, antennal flagellum with brown spots at apex, connected arista, arista with shorter microtrichia (Fig. 2A).

Thorax color dark with 1 longitudinal stripe on both sides, pronotum extends to scutellum; pronotum dark brown at anterior, 2 “long oval” spots in the middle, the rest is dark yellow. Scutellum dark brown; anepisternum dark brown, katepisternal dark brown. Prescutellar acrostichal bristle absent, 1 postpronotal bristle, 2 notopleural bristle, 1 postsutural supra-alar bristle, 1+2 dorsocentral bristle, dark brown; 1 intra-alar bristle, 2 postalar bristles, dark brown, posterior bristles tiny; 1 scutellar bristle, 1 apical scutellar bristle, strong, dark brown; 1 anepisternum bristle, 1 katepisternal seta. Legs light yellow with

tibiae brown. Wing (Fig. 2B) with light brown spots on distal 1/2 and along veins R_{2+3}, the front pale yellow and the back dark, brown. The M_1 ratio 7; haltere white.

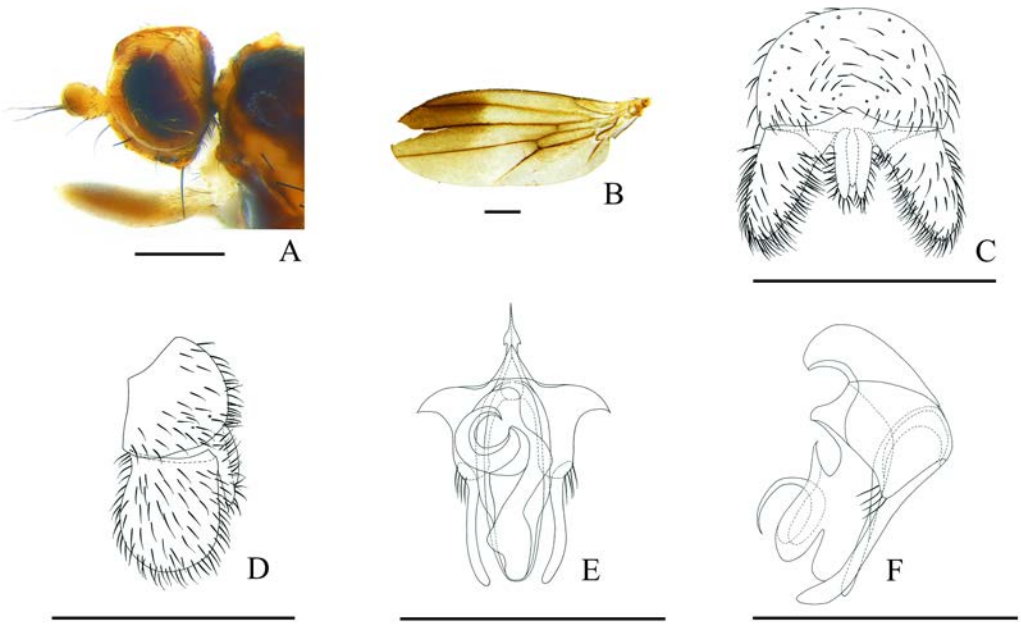

Figure 2. *Clusiodes discostylus* Sueyoshi, 2006, ♂. A. Head, lateral view; B. Wing; C, D. Epandrium, cerci, and surstylus, posterior and lateral views; E, F. Hypandrial complex, ventral and lateral views. Scale bars = 0.5 mm (A, B); 0.1 mm (C–F).

Abdomen brown; bristle and setulae dark brown. Male genitalia: epandrium 1.25 times as high as wide. Cerci small, height and width almost equal, 1/4 separate at distal. Surstylus (Figs 2C, 2D) big, nearly round in shape, 0.4 times the length of the genitalia; inner and outer faces with sparse setulae, without spinulae at apex. Postgonite triangular, with four bristles. Postgonite and basiphallus equal in length, no protrusions. Basiphallus extended to the apex of aedeagus. Distiphallus (Figs 2E, 2F) long, membranous.

Female. Unknown.

Specimens examined. 2♂, **China**, Shaanxi, Zhouzhi, 2,037 m, 19-VIII-2014, Xuankun LI.

Diagnosis. Thorax color dark with 1 longitudinal stripe on both sides, pronotum extends to scutellum; pronotum dark brown on anterior, 2 “long oval” spots in the middle; cerci small, height and width almost equal, 1/4 separate at apex.

Remarks. *C. discostylus* was similar to Nearctic *C. discostylus* (Malloch 1922) and Palearctic *C. albimanus* (Meigen 1830), body color, wide surstylus and long dorsocentral bristles are similar. The developed post-ocellar bristles are different, *C. discostylus* and *C. albimanus* middle and hind legs yellow, pleura yellow (Sueyoshi 2006).

Acknowledgements

We are grateful to Dr. Xuankun LI (Beijing) for his kind help in collecting the specimens. This work was supported by the Natural Science Foundation of Henan (232300420010), the Undergraduate Teaching Engineering Course Construction Project of Henan Agricultural University (2023KC03; 2024KC14), the National Natural Science Foundation of China (32470470; 31672333), the Special Foundation for National Science and Technology Basic Research Program of China (2018FY100400), the earmarked fund for CARS (CARS-27) and the Natural Science Youth Innovation Fund of Henan Agricultural University (KJCX 2019A11).

References

Caloren DC & Marshall SA. 1998. A revision of the New World species of *Clusiodes* Coquillett (Diptera: Clusiidae). *Studia Dipterologica*, 5: 261–321.

Coquillett DW. 1904. New Diptera from Central America. *Proceedings of the Entomological Society of Washington*, 6: 90–98.

Fallén CF. 1823. *Heteromyzides Sveciae*. Berlingianis, Lundae, 10 pp.

Frey R. 1960. Studien über indoaustralische Clusiiden (Dipt.) nebst Katalog der Clusiiden. *Commentationes Biologicae*, 22 (2): 1–31.

Lonsdale O. 2017. World Catalogue of the Druid Flies (Diptera: Schizophora: Clusiidae). *Zootaxa*, 4333(1): 81–85.

Lonsdale O & Marshall SA. 2006. Revision of the New World *Craspedochaeta* Czerny. *Zootaxa*, 1291: 1–101.

Lonsdale O & Marshall SA. 2007. Redefinition of the genera *Clusiodes* and *Hendelia* (Diptera: Clusiidae: Clusiodinae), with a review of *Clusiodes*. *Studia Dipterologica*, 14: 117–159.

Lonsdale O & Marshall SA. 2012. *Sobarocephala* (Diptera: Clusiidae: Sobarocesphalinae) — Subgeneric classification and revision of the New World species. *Zootaxa*, 3370: 1–307.

Malloch JR. 1922. Notes on Clusiodidae (Diptera). *Occasional Papers of the Boston Society of Natural History*, 5: 47–50.

Marshall SA. 2000. Agonistic behaviour and generic synonymy in Australian Clusiidae (Diptera). *Studia Dipterologica*, 7: 3–9.

Meigen JW. 1830. *Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten*. Smithsonian Institution Archives, George Washington, 401pp.

Soos A. 1987. Clusiidae. *In*: McAlpine JF (Ed.), *Manual of Nearctic Diptera*. Agriculture Canada, Canada, pp. 853–857.

Sueyoshi M. 2006. Species diversity of Japanese Clusiidae (Diptera: Acalyptrata) with description of 12 new species. *Annales de la Société Entomologique de France*, 42(1): 24–26.

Sueyoshi M, Maeto K, Makihara H, Makino S & Iwai T. 2003. Changes in dipteran assemblages with secondary succession of temperate deciduous forests following clear-cutting. *Bulletin of FFPRI*, 3(2): 171–191.

Yang SL, Yin XM & Xi YQ. 2024. Four new species of the genus *Hendelia* Czerny, 1903 (Diptera, Clusiidae) from China. *ZooKeys*, 1212: 255–266.