



Discovery of Subgenus *Neoilliesiella* (Diptera: Empididae) in the Oriental Region, with Description of a New Species from Southern Tibet

Authors: Liu, Xiaoyan, Shi, Li, and Yang, Ding

Source: Florida Entomologist, 97(3) : 1104-1107

Published By: Florida Entomological Society

URL: <https://doi.org/10.1653/024.097.0316>

The BioOne Digital Library (<https://bioone.org/>) provides worldwide distribution for more than 580 journals and eBooks from BioOne's community of over 150 nonprofit societies, research institutions, and university presses in the biological, ecological, and environmental sciences. The BioOne Digital Library encompasses the flagship aggregation BioOne Complete (<https://bioone.org/subscribe>), the BioOne Complete Archive (<https://bioone.org/archive>), and the BioOne eBooks program offerings ESA eBook Collection (<https://bioone.org/esa-ebooks>) and CSIRO Publishing BioSelect Collection (<https://bioone.org/csiro-ebooks>).

Your use of this PDF, the BioOne Digital Library, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Digital Library content is strictly limited to personal, educational, and non-commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne is an innovative nonprofit that sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

DISCOVERY OF SUBGENUS *NEOILLIESIELLA* (DIPTERA: EMPIDIDAE) IN THE ORIENTAL REGION, WITH DESCRIPTION OF A NEW SPECIES FROM SOUTHERN TIBET

XIAOYAN LIU^{1,2}, LI SHI^{1,3,*} AND DING YANG^{1,*}

¹Department of Entomology, College of Agronomy and Biotechnology, China Agricultural University, Beijing 100193, China

²Hubei Insect Resources Utilization and Sustainable Pest Management Key Laboratory, College of Plant Science and Technology, Huazhong Agricultural University, Wuhan 430070, China

³College of Agronomy, Inner Mongolia Agricultural University, Hohhot 010019, China

*Corresponding authors; E-mail: lishilauxaniid@gmail.com (LS); dyangcau@aliyun.com (DY)

ABSTRACT

Subgenus *Neoilliesiella* of the genus *Heleodromia* in the subfamily Trichopezinae (Diptera: Empididae) is distributed only in eastern Europe with 2 known species. Recently this rare subgenus was found in the Oriental Region. One new species, *Heleodromia (Neoilliesiella) orientalis* **sp. nov.**, is described from southern Tibet. A key to the species of the subgenus is presented.

Key Words: dance fly, *Heleodromia (Neoilliesiella) orientalis* **sp. nov.**, Oriental Region, Tibet

RESUMEN

El subgénero *Neoilliesiella* del género *Heleodromia* en la subfamilia Trichopezinae (Diptera: Empididae) está distribuido solamente en el este de Europa con 2 especies conocidas. Recientemente, se encontró esta subgénero raro en la Región Oriental. Se describe una nueva especie, *Heleodromia (Neoilliesiella) orientalis* **sp. nov.**, del sur del Tíbet. Se presenta una clave para las especies del subgénero.

Palabras Clave: mosca danza, *Heleodromia (Neoilliesiella) orientalis* **sp. nov.**, Región Oriental, Tíbet

The genus *Heleodromia* Haliday, 1833 belongs to the subfamily Trichopezinae (Diptera: Empididae) with 26 known species distributed in the Holarctic and Oriental regions (Yang et al. 2007; Sinclair et al. 2011; Liu et al. 2012; Wang et al. 2013). This genus is characterized by the following features: first flagellomere with uniformly very thin apex; proboscis long and thickened; R_{4+5} not forked, anal cell with acutely pointed postero-distal corner; male genitalia strongly swollen and elongated like some Hemerodromiinae (Collin 1961; Saigusa 1963; Wagner 1985; Wagner et al. 2004; Liu et al. 2012). It contains 2 subgenera, *Heleodromia* and *Neoilliesiella* (Wagner 1985; Wagner & Özdikmen 2006; Yang et al. 2007).

Subgenus *Neoilliesiella* Wagner et Özdikmen, 2006 may be separated from subgenus *Heleodromia* by the pregenital segments being rather thick with sternites 7–8 not reduced in size and male genitalia not bean-shaped, while in subgenus *Heleodromia* the pregenital segments are distinctly narrowed with sternites 7–8 reduced in

size and male genitalia are bean-shaped (Wagner 1985; Wang et al. 2013). This subgenus is distributed only in Eastern Europe with the following 2 known species: *Heleodromia (Neoilliesiella) banatica* Wagner, 1985 from Romania and *Heleodromia (Neoilliesiella) pectinulata* (Strobl, 1898) from Bosnia and Herzegovina, Croatia. These 2 known species were well described and illustrated by Wagner (1985).

Tibet with its peculiar biodiversity is a plateau region in Asia, located in the north east of the Himalayas. It is the highest region on earth, with an average elevation of 4,900 metres (16,000 ft). It mostly belongs to the Palaearctic Region except that Southern Tibet is considered as Oriental. But the fauna of dance flies in Tibet is poorly known (Yang & Yang 2004; Yang et al. 2007). Here we report our recent discovery of this rare subgenus in the Oriental Region with one new species, based on specimens collected by Dr. Gang Yao from the subtropical forest in southern Tibet in 2013. A key to the species of this subgenus is presented.

The type specimens are deposited in the Entomological Museum of China Agricultural University (CAU), Beijing. Terms used for adult structures and male genitalia follow those of McAlpine (1981). The following abbreviations are used: acr

= acrostichal seta(e), av = anteroventral seta(e), dc = dorsocentral seta(e), h = humeral seta(e), npl = notopleural seta(e), ph = posterior humeral seta(e), oc = ocellar seta(e), psa = postalar seta(e), sc = scutellar seta(e).

KEY TO SPECIES OF *NEOILLIESIELLA*

1. Acr 3–4 paired; epandrium basally with dorsal process directed upwards or backwards 2
- . Acr absent; epandrium basally without dorsal process *Heleodromia (Neoillesiella) orientalis* **sp. nov.**
2. 4 dc; epandrium basally with short dorsal process directed upwards; tergite 8 with a triangular incision at base *Heleodromia (Neoillesiella) banatica* Wagner
- . 3 dc; epandrium basally with long dorsal process strongly curved backwards; tergite 8 without incision at base *Heleodromia (Neoillesiella) pectinulata* (Strobl)

HELEODROMIA (NEOILLIESIELLA) *ORIENTALIS* **SP. NOV.** (Figs. 1-4)

Diagnosis

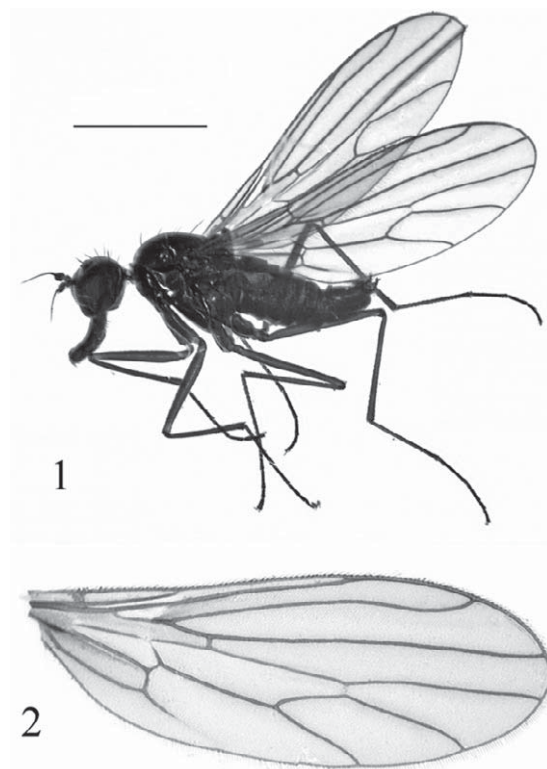
Antenna black. Acr absent. Legs entirely blackish. All femora with short hair-like pale av except 4 basal av of fore femur relatively long. Tergite 8 with distinct mid-anterior incision. Epandrial lobe long finger-like with 7-8 at tip; surstylus long finger-like, distinctly curved, with 6 spines at apical margin.

Male

Body length 2.2-2.5 mm, wing length 2.7-2.9 mm (Fig. 1).

Head black with pale gray pollen. Eyes very narrowly separated on face, dark brown. Setae and setulae on head black except posteroventral surface with brownish setulae; ocellar tubercle distinct with pair of long oc. Antenna black; first flagellomere basally nearly quadrate, apically uniformly very thin, 1.6X longer than wide; arista very long, 1.9-2.0X as long as the first flagellomere; pedicel with circle of black subapical hairs, first flagellomere and arista very short micropubescent. Proboscis long thick, apically curved forward, 0.8X as long as head height, blackish with blackish or brownish setulae. Palpus blackish with blackish setulae, apically with 4 long weak blackish dorsal setae.

Thorax black with pale gray pollinosity. Setae and setulae on thorax black; pronotum with 1 seta laterally; 1 short h, 1 short ph, 1 npl, acr absent, 4 long dc, 1 long psa; scutellum with 2 long sc. Legs entirely blackish. Setulae and setae on legs blackish except those on coxae pale; all femora with row of very short pale av setulae except fore femur basally with 4 long av setulae slightly shorter than femur



Figs. 1 and 2. *Heleodromia (Neoillesiella) orientalis* **sp. nov.** 1. Male adult, lateral view; 2. Male wing. Scale bar = 1 mm.

thickness. Fore femur 1.2X as thick as mid femur, mid and hind femora subequal in thickness. Wing (Fig. 2) hyaline, slightly tinged grayish; veins dark brown. Squama dark brown, bordered with dark yellow setulae. Halter dark brown, knob basally with 3-4 dorsal setulae and 3-4 ventral setulae.



Figs. 3 and 4. *Heleodromia* (*Neoilliesiella*) *orientalis* **sp. nov.** (male). 3. Genitalia, lateral view; 4. Tergite 8, dorsal view. Abbreviations: epn = epandrium; epnl = epandrial lobe; hyp = hypandrium; ph = phallus; s8 = sternite 8; sur = surstylus; t8 = tergite 8. Scale bar = 0.1 mm.

Abdomen black with pale gray pollinosity; hypopygium partly brownish yellow. Setulae and setae on abdomen dark yellow except hypopygium with some blackish setulae and setae.

Male genitalia (Figs. 3 and 4). Tergite 8 and sternite 8 not reduced; tergite 8 with distinct anterior incision. Epandrium and hypandrium much elongated and rather large, subequal in length. Epandrial lobe long finger-like with 7-8 setulae at tip; surstylus long finger-like, distinctly curved, with 6 short spines at apical margin.

Female

Unknown.

Type Material

HOLOTYPE ♂, CHINA: Tibet, Medog (N 29° 19' 41.38" E 95° 19' 55.55"), 80K, 1000 m, 2013.

IX.12, Gang Yao (in 75% alcohol, deposited in CAU). Paratypes: 3♂♂, same data as holotype (in 75% alcohol, deposited in CAU). These specimens were collected from the subtropical forest with a sweep net.

Distribution

China (Tibet) (Fig. 5).

Remarks

Among 3 *Neoilliesiella* species, 2 European species *H. (N.) banatica* and *H. (N.) pectinulata* seems to be very similar in having 3-4 paired acr and epandrium with the well developed dorsal process (Wagner 1985). *H. (N.) orientalis* may be easily separated from 2 European species by the absence of acr and epandrial dorsal process.

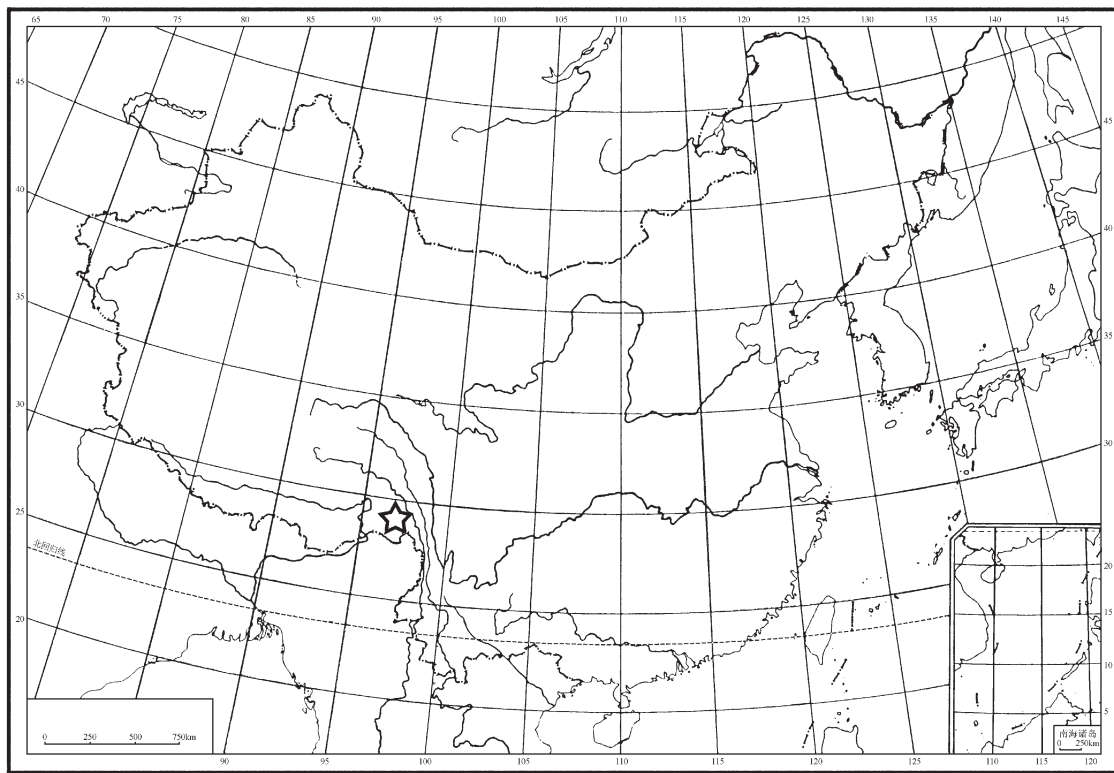


Fig. 5. Distribution of *Heleodromia* (*Neoilliesiella*) *orientalis* sp. nov.

Etymology

The specific name refers to the Oriental distribution of this new species.

ACKNOWLEDGMENTS

We are very grateful to Mr. Xiao Zhang and Ms. Cui Tang (Beijing) for their help during the study. Three anonymous reviewers are thanked for providing useful comments on an earlier draft of this paper. The research was funded by the National Natural Science Foundation of China (31272354), National “Twelfth Five-Year” Plan for Science & Technology Support (2012BAD19B00), the Ministry of Science and Technology of the People’s Republic of China (2005DKA21402, 2012FY111100, MOST Grant 2011FY120200).

REFERENCES CITED

- COLLIN, J. E. 1961. Empididae. In *British Flies*, Vol. 6. Cambridge Univ. Press, 782 pp.
- HALIDAY, H. 1833. Catalogue of Diptera occurring about Hollywood in Downshire. *Entomol. Mag.* 1: 147-180.
- LIU, X. Y., WANG, J. J., AND YANG, D. 2012. *Heleodromia* Haliday newly recorded from China with descriptions of two new species (Diptera: Empidoidea). *Zootaxa* 3159: 59-64.
- MCALPINE, J. F. 1981. Morphology and terminology – adults, pp. 9-63 In J. F. McAlpine, B. V. Peterson, G. E. Shewell, H. J. Teskey, J. R. Vockeroth and D. M. Wood [Coords.], *Manual of Nearctic Diptera*. Vol. 1. Agric. Canada Monograph 27.
- SAIGUSA, T. 1963. Studies on the genus *Heleodromia* in Japan (Diptera, Empididae). *Sieboldia* 3(1): 119-130.
- SINCLAIR, B. J., BROOKS, S. E., CUMMING J. M., AND COOVERT, G. A. 2011. Revision of the Nearctic species of *Heleodromia* (Diptera: Empidoidea: Brachystomatidae). *Canadian Entomol.* 143: 629-651.
- WAGNER, R. 1985. A revision of the genus *Heleodromia* (Diptera, Empididae) in Europe. *Aquatic Insects* 7(1): 33-43.
- WAGNER, R., LEESE, F., AND PANESAR, A. R. 2004. Aquatic dance flies from a small Himalayan mountain stream (Diptera: Empididae: Hemerodromiinae, Trichopezinae and Clinocerinae). *Bonn Zool. Beitr.* 52(1-2): 3-32.
- WAGNER, R., AND ÖZDIKIMEN, H. 2006. Replacement name for the preoccupied genus group name *Illiesiella* Wagner, 1985 (Diptera: Empididae). *Munis Entomol. Zool.* 1: 91-92.
- WANG, J. C., WANG, M. Q., AND YANG, D. 2013. *Heleodromia* Haliday newly found in Tibet with description of one new species (Diptera: Empidoidea: Trichopezinae). *Zootaxa* 3746(3): 489-494.
- YANG, D., AND YANG, C. K. 2004. Diptera, Empididae, Hemerodromiinae and Hybotinae. *Fauna Sinica Insecta*. Vol. 34. Sci. Press, Beijing. 329 pp.
- YANG, D., ZHANG, K. Y., YAO, G., AND ZHANG, J. H. 2007. World catalog of Empididae (Insecta: Diptera). China Agric. Univ. Press, Beijing. 599 pp.