

ORIGINAL ARTICLE

New species of *Nepalomyia henanensis* species group from China (Diptera: Dolichopodidae: Peloropeodinae)

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Abstract Three new species of *Nepalomyia henanensis* species group are described from China, *N. damingshanus* **sp. nov.**, *N. dongae* **sp. nov.**, and *N. shennongjiaensis* **sp. nov.** A key to known species of this species group is presented.

Key words Dolichopodidae, Peloropeodinae, *Nepalomyia henanensis* group, new species, China.

1 Introduction

The genus *Nepalomyia* Hollis, 1964 is the largest genus of the subfamily Peloropeodinae, with 65 known species worldwide. It is mainly from the Oriental Region (Hollis, 1964; Dyte, 1975; Yang *et al.*, 2006), especially lowland areas in Southeast Asia, even though seven species known in the Holarctic Region (Robinson, 1964; Negrobov, 1991; Runyon & Hurley, 2003). The genus is characterized by the following features: hind tarsomere 1 shortened (shorter than hind tarsomere 2), males with 1 basal spur directed upward; male genitalia rather large and mostly exposed from tip of abdomen, surstylus on epandrium divided into three separated (dorsal, middle and ventral) lobes, ventral lobe with apical hairs (or not), cercus in most species complex in shape and with basal hairs usually on tubercle. The epandrium and hypandrium show various modifications and provide useful evidence for specific identification.

Nepalomyia henanensis species group is the largest group in the six species groups of the genus *Nepalomyia*, with 18 known species, including three new species reported here: *N. damingshanus* **sp. nov.**, *N. dongae* **sp. nov.**, and *N. shennongjiaensis* **sp. nov.** A key to known species of this species group is presented in this paper.

2 Materials and methods

The specimens in this study were collected by different collectors with sweep netting and Markov trap in Guangxi, Hubei and Zhejiang Provinces. The materials are preserved in 75% alcohol and deposited in the Entomological Museum of China Agricultural University (CAU), Beijing.

Morphological terminology for adult structures mainly follows McAlpine (1981). Terms for structures of male genitalia follow Cumming *et al.* (1995): *acr*-acrostichal bristle, *ad*-anterodorsal, *av*-anteroventral, *CuAx* ratio-length of m-cu crossvein/distal section CuA, *dc*-dorsocentral bristle, *LI*-fore leg, *LII*-mid leg, *LIII*-hind leg, *pd*-posterodorsal bristle,

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pv-posteroventral bristle, *v*-ventral bristle.

3 Genus *Nepalomyia* Hollis

Nepalomyia Hollis, 1964: 110. Type species: *Nepalomyia dytei* Hollis, 1964.

Neurigonella Robinson, 1964: 119. Type species: *Neurigona nigricornis* Van Duzee, 1914.

Nepalomyia henanensis species group

Diagnosis. Body median-sized (body length 2.0–3.9 mm), usually with metallic green or dark brown body coloration. Male genitalia large and mostly exposed: epandrium with short finger-like or large lateral lobe; hypandrium with deep or shallow bifurcated apex, symmetrical in ventral view.

Remarks. Eighteen species are known so far from China.

Key to species of *Nepalomyia henanensis* group from China (males)

1. First flagellomere distinctly longer than wide (unknown for *N. zhangae*) 2
 First flagellomere wider than long (or as long as wide) 6
2. First flagellomere about 1.2 times as long as wide *N. hastate* Wang, Yang & Grootaert
 First flagellomere much elongated, more than 2.5 times as long as wide 3
3. Hind tarsomere 1 shortened and thickened with furcated basal spur *N. furcata* (Yang & Saigusa)
 Hind tarsomere 1 not shortened or thickened with furcated basal spur 4
4. Hypandrium deeply bifurcated 5
 Hypandrium only shallowly bifurcated apex *N. hui* Wang & Yang
5. Hind tibia with one *ad* and 3–4 *pd* bristles, hind tarsomere 1 with one *v* at base *N. horvati* Wang & Yang
 Hind tibia with two *ad* and 5–6 *pd*, hind tarsomere 1 with two *v* at base *N. zhangae* Wang, Yang & Grootaert
6. First flagellomere as long as wide 7
 First flagellomere distinctly wider than long 9
7. Four *dc*; cercus band-like, with thin basal tubercle; aedeagus rather thick and subgeniculate apically .. *N. daliensis* (Yang & Saigusa)
 Five *dc*; cercus subtriangular, with swollen basal tubercle; aedeagus slender 8
8. First flagellomere with distinct upper and lower corners; cercus with quadrate basal tubercle *N. dongae* sp. nov.
 First flagellomere with lower but no upper corner; cercus with round basal tubercle *N. jinshanensis* Wang, Yang & Grootaert
9. Thoracic pleuron wholly dark metallic green 10
 Thoracic pleuron brownish yellow to yellow except upper portion or pteropleuron dark 15
10. First flagellomere with short lower apical corner 11
 First flagellomere with long lower apical corner 14
11. Cercus with finger-like basal tubercle bearing many long bristles; hypandrium with small apical incision
 *N. pilifera* (Yang & Saigusa)
 Cercus without basal tubercle 12
12. Hind tibia with 1 *ad*; CuAx ratio 0.4; cercus with long finger-like process, geniculate basally *N. Zhouzhiensis* (Yang & Saigusa)
 Hind tibia with 2 *ad*; CuAx ratio 0.6; cercus without process 13
13. Fore tibia with 2 *ad*; epandrium with 2 lateral processes *N. damingshanus* sp. nov.
 Fore tibia without distinct *ad*; epandrium without lateral process *N. henanensis* (Yang, Yang & Li)
14. Halter yellow; hypandrium somewhat long and narrow, with a V-shaped apical incision *N. brevifurcata* (Yang & Saigusa)
 Halter dark brown with yellow base; hypandrium short and broad, with a small, quadrate apical incision
 *N. daweishana* (Yang & Saigusa)
15. Acr absent; 6 *dc*; thoracic pleuron brownish yellow to yellow except upper portion dark *N. pingbiana* (Yang & Saigusa)
 Acr present; 5 *dc*; thoracic pleuron brownish yellow to yellow except pteropleuron dark 16
16. Hind tibia with 3 *pd*; cercus with weak basal tubercle and distinct middle tubercle; aedeagus slender .. *N. taiwanensis* Wang & Yang
 Hind tibia with 7–8 *pd*; cercus with distinct basal tubercle, but without middle tubercle; aedeagus long and broad, apically with
 finger-like lateral processes 17
17. Hind tibia with 1 *ad*; aedeagus with 4 finger like lateral processes *N. shennongjiaensis* sp. nov.
 Hind tibia with 4 *ad*; aedeagus with 2 finger like lateral processes *N. guangdongensis* Wang, Yang & Grootaert

Nepalomyia damingshanus sp. nov. (Fig. 1)

Male. Body length 2.4–2.6 mm; wing length 2.4–2.5 mm. Head dark metallic green with grayish-brown pollinosity; face with pale-gray pollinosity. Hairs and bristles on head black; postocular bristles (including ventral hairs) black. Ocellar tubercle weakly raised, with 2 strong ocellar bristles and 2 short posterior hairs. Antenna blackish; first flagellomere almost as long as wide, with distinct lower and upper apical corners; arista black, with short basal segment. Proboscis brown with black hairs; palpus black with black hairs and 1 black apical bristle.

Thorax dark metallic green with gray pollinosity. Hairs and bristles on thorax black; 5 strong dorsocentral bristles, 5–6 irregularly paired acrostichal bristles; 1 long humeral bristle and 1 short hair, 1 long posthumeral bristle, 1 somewhat short inner humeral bristle, 1 short sutural bristle, 1 long anterior and 1 somewhat short posterior notopleural bristles, 1 somewhat short anterior and 1 long posterior supraalar bristles, 1 long postalar bristle; scutellum with 2 pairs of bristles, outer pair weak and short. Propleuron with 1 blackish hair on upper portion.

Legs yellow, tarsus brownish. Hairs and bristles on legs black; fore coxa with 5–6 anterior bristles, mid coxa with 2–3 anterior yellow bristle, hind coxa with 1 outer bristle near middle. Mid and hind femora each with 1 preapical bristle. Fore tibia with 2 *ad* near apex; mid tibia with 2 *ad*, 2 *pd*, and apical 1/4 with 1 *ad*, 1 *pd* and 1 *pv*; hind tibia with 2 *ad* at basal half, a row of 5 *pd* at apical half. Fore tarsomeres 1 with 3–4 *v* at basal half, apical half of fore tarsomere 1 and whole fore tarsomeres 2–4 with a row of weak and curved ventral hairs; hind tarsomere 1 with upwardly curved spur. Relative lengths of tibia and 5 tarsomeres of L I 3.0:2.4:1.6:1.4:0.6:0.6; L II 4.5:2.4:1.6:1.4:0.8:0.6; L III 5.6:1.1:2.4:1.4:1.0:0.5.

Wing hyaline, with grayish; veins dark brown, R_{4+5} and M parallel apically; CuAx about 0.6. Squama black, bearing black long hairs. Halter brown.

Abdomen dark metallic green, with gray brown pollinosity. Hairs and bristles on abdomen black.

Male genitalia. Epandrium with 2 short lateral process, each bearing long apical bristle; surstylus on epandrium with long and thick dorsal lobe, thick mid lobe with thin apical half bearing hairs and bristles, ventral lobe thin with apical bristles. Cercus long with wide base, without distinct basal tubercle but bearing 2 clusters short hairs at basal 1/3 and half, apical with curved process and hairs; hypandrium long and deeply bifurcated, symmetrical in ventral view; aedeagus long and thin, with bifurcated apex.

Female. Unknown.

Holotype male, Guangxi, Nanning, Mt. Daming, elev. 1300 m, 9 August 2011, leg. Hui Dong. Other material 1 male, Zhejiang, Mt. Tianmu, 6 July 2012 (Markov trap).

Distribution. Guangxi, Zhejiang.

Remarks. The new species is similar to *N. henanensis* (Yang, Yang & Li), but can be separated from the latter by having 2 *ad* on fore tibia, and epandrium bearing 2 lateral processes. In *N. henanensis*, the fore tibia has no *ad* or *pd*, and the epandrium bearing no lateral process (Yang, Yang & Li).

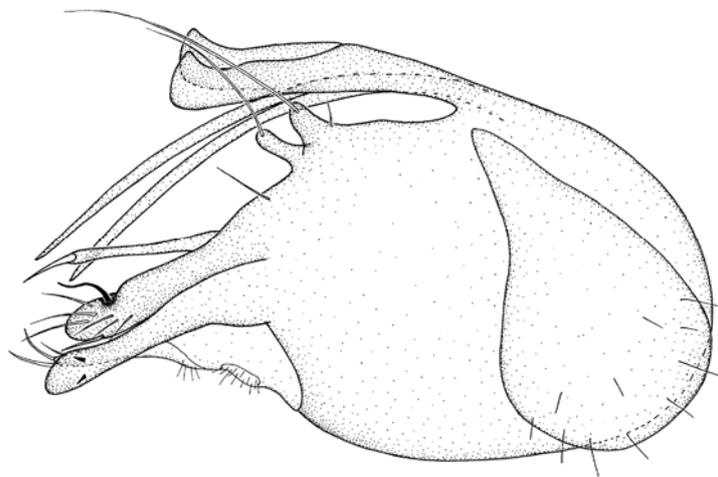


Fig. 1. *Nepalomyia damingshanus* sp. nov., male, genitalia, lateral view.

***Nepalomyia dongae* sp. nov.** (Figs 2–4)

Male. Body length 2.5 mm; wing length 2.5 mm. Head dark metallic green with grayish-brown pollinosity; face with pale-gray pollinosity. Hairs and bristles on head black; postocular bristles (including ventral hairs) pale yellow. Ocellar tubercle weakly raised, with 2 strong ocellar bristles and 2 short posterior hairs. Antenna blackish; first flagellomere almost as long as wide (Fig. 2), with distinct lower and upper apical corners; arista located in apical incision, black, with short basal segment. Proboscis blackish with black hairs; palpus black with black hairs and 1 black apical bristle.

Thorax dark metallic green with gray pollinosity. Hairs and bristles on thorax black; 5 strong *dc*, 6–7 irregularly paired *acr*; 1 long humeral bristle and 1 short hair, 1 long posthumeral bristle, 1 somewhat short inner humeral bristle, 1 short sutural bristle, 1 long anterior and 1 somewhat short posterior notopleural bristles, 1 somewhat short anterior and 1 long posterior supra-alar bristles, 1 long postalar bristle; scutellum with 2 pairs of bristles, outer pair weak and short. Propleuron with 1 blackish hair on upper portion and 2 short pale hairs and 1 black bristle on lower portion.

Legs (mid and hind tarsomeres 3–5 broken) brownish, tarsus brown. Hairs and bristles on legs black; fore coxa with 5–6 anterior bristles, mid coxa with 2–3 anterior yellow bristle, hind coxa with 1 outer bristle near middle. Fore femur with 1 *av* and 1 *pv* apically, mid femur with 1 preapical bristle and row of short *v*. Fore tibia with row of strong *d*, and 4–5 weak and curved ventral hairs; mid tibia with 2 *ad*, 2 *pd*, and 4 apical bristles; hind tibia with 3 *ad*, 2 *pd*, and row of short *v*. Fore tarsomeres 1–5 each with row of weak and curved ventral hairs, tarsomere 3 distinctly longer than tarsomeres 2 and 4; hind tarsomere 1 with upwardly curved spur and 3 strong *v* at base, hind tarsomere 2 with row of *v*. Relative lengths of tibia and 5 tarsomeres of L I 2.0:1.2:0.5:0.8:0.5:0.3; L II 3.0:1.5:1.0:?:?:?; L III 3.5:0.3:1.8:?:?:?.

Wing hyaline, with grayish; veins dark brown, R_{4+5} and M parallel apically; CuAx about 0.33. Squama dark brown, bearing black long hairs. Halter brown.

Abdomen dark metallic green, with gray brown pollinosity. Hairs and bristles on abdomen black; venter with some pale hairs.

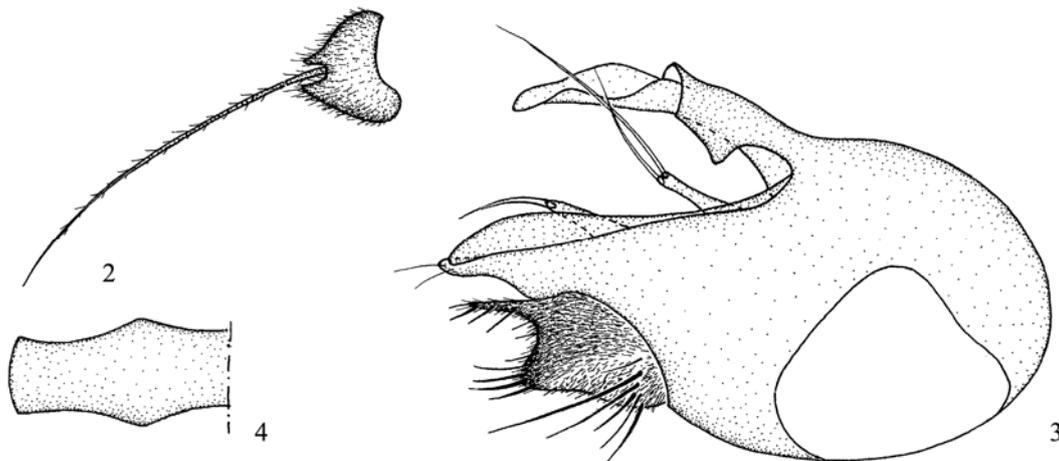
Male genitalia (Figs 3–4). Epandrium with slender lateral process, bearing 2 long apical bristles; surstylus on epandrium with wide dorsal lobe, with curve apex bearing hairs, mid lobe somewhat swollen in the middle portion and bending inward, ventral lobe thin and short with apical bristle. Cercus with wide base nearly square and acute apex, with indistinct basal tubercle bearing long hairs, with spine-like bristles and hairs at mid and apical portion; hypandrium short, with slightly convex and symmetrical in ventral view; aedeagus wide with swollen near apex.

Female. Unknown.

Holotype male, Guangxi, Nanning, Mt. Daming, elev. 1 300 m, 9 August 2011, leg. Hui Dong.

Distribution. Guangxi.

Remarks. The new species is similar to *N. jinshanensis* Wang, Yang & Grootaert bearing spine-like bristles on cercus, but it can be separated from the latter by having first flagellomere with distinct upper and lower corners, and cercus without distinct basal tubercle. In *N. jinshanensis*, the first flagellomere has no upper corner, and the cercus has distinct basal tubercle (Wang, Yang & Grootaert, 2009).



Figs 2–4. *Nepalomyia dongae* sp. nov., male. 2. First flagellomere. 3. Genitalia, lateral view. 4. Hypandrium, ventral view.

Nepalomyia shennongjiaensis sp. nov. (Figs 5–6)

Male. Body length 2.6 mm; wing length 2.4 mm. Head dark metallic green with grayish-brown pollinosity; face with pale-gray pollinosity. Hairs and bristles on head black; postocular bristles (including ventral hairs) black. Ocellar tubercle weakly raised, with 2 strong ocellar bristles and 2 short posterior hairs. Antenna brown; first flagellomere triangular, wider than long, with distinct lower apical corner; arista brown, with short basal segment, with short blackish hairs. Proboscis blackish with black hairs; palpus black with black hairs and 1 black apical bristle.

Thorax dark metallic green with gray pollinosity, pleuron dark brown with gray pollinosity. Hairs and bristles on thorax black; 6 strong *dc*, 3 or 4 irregularly paired *acr*; 1 long humeral bristle and 1 short hair, 1 long posthumeral bristle, 1 somewhat short inner humeral bristle, 1 short sutural bristle, 1 long anterior and 1 somewhat short posterior notopleural bristles, 1 somewhat short anterior and 1 long posterior supra-alar bristles, 1 long postalar bristle; scutellum with 2 pairs of bristles, outer pair weak and short. Propleuron with 1 short hair and 1 black bristle on lower portion.

Legs yellow (mid and hind tarsomeres 4 and 5 missing); mid coxae with black upper lateral corner; mid and hind tarsi brownish. Hairs and bristles on legs black; fore coxa with 4–6 anterior bristles, mid coxa with 1 anterior bristle, hind coxa with 1 outer bristle near middle. Mid and hind femora each with 1 preapical bristle. Fore tibia with 3 short bristles apically; mid tibia with 2 *ad*, 2 *pd*, and 4 apical bristles; hind tibia with 1 *ad*, 7–8 *pd*, and 3 apical bristles. Fore tarsomere 1 with 1 row of *v*, and tarsomeres 3–4 with row of curved ventral hairs; hind tarsomere 1 shortened, with upwardly curved spur and 2 strong *v* at base and 2 rows of *v*. Relative lengths of tibia and 5 tarsomeres of L I 5.0:3.3:2.0:1.7:1.3:0.9; L II 6.5:3.8:2.2:1.9:?:?; L III 7.6:2.0:3.2:2.4:?:?.

Wing hyaline, with grayish; veins dark brown, R_{4+5} and M parallel apically; CuAx about 0.45. Squama blackish with black long hairs. Halter yellow.

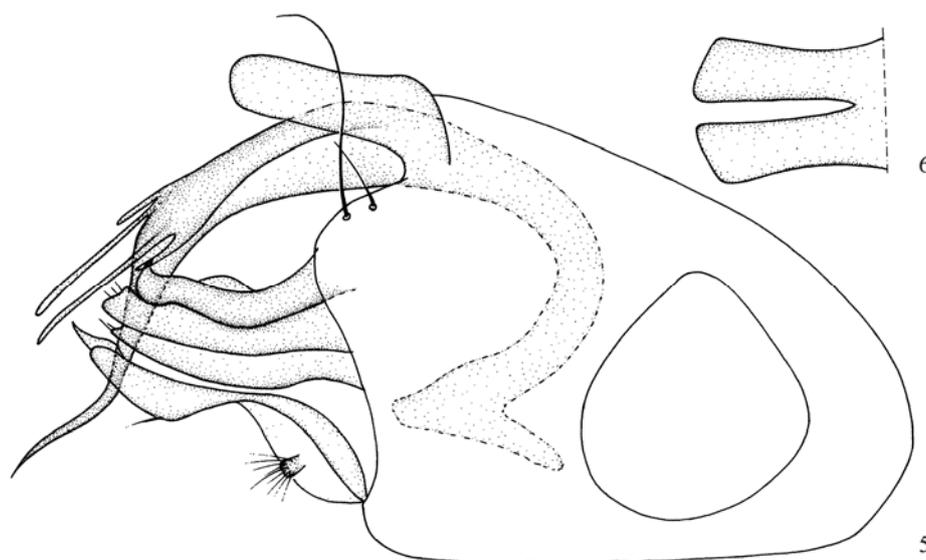
Abdomen metallic green, with gray brown pollinosity; lateral portion yellow. Hairs and bristles on abdomen black; venter with some pale hairs.

Male genitalia (Figs 5–6). Epandrium without distinct lateral process, but bearing 2 white long lateral bristles at base; surstylus on epandrium with long and curved three lobes, both dorsal and mid lobes with apical hairs; ventral lobe, bearing acute apex. Cercus wide, with distinct basal tubercle; hypandrium short and broad, deeply bifurcate apically, and symmetrical in ventral view; aedeagus long, apically with 4 finger-like lateral processes and 1 long and acute middle process.

Female. Unknown.

Holotype male, Hubei, Shennongjia, Qianjiaping, 4 July 2009, leg. Qi-Fei Liu. Paratype 1 male, Hubei, Shennongjia, Dalongtan, 30 July 2012, leg. Ting-Ting Zhang.

Distribution. Hubei.



Figs 5–6. *Nepalomyia shennongjiaensis* sp. nov., male. 5. Genitalia, lateral view. 6. Hypandrium, ventral view.

Remarks. The new species is similar to *N. guangdongensis* Wang, Yang & Grootaert from Guangdong Province in having short first flagellomere and 7–8 posterodorsal bristles on hind tibia, but can be separated from the latter by having hind tibia with 1 *ad*, aedeagus apically with 4 finger-like lateral processes. In *N. guangdongensis*, the hind tibia has 4 *ad*, and the aedeagus apically has 2 finger-like lateral processes (Wang, Yang & Grootaert, 2009).

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