Revision of the Nearctic Species of *Nepalomyia* Hollis (= *Neurigonella* Robinson) (Diptera: Dolichopodidae: Poloropoeidinae) with a World Catalog

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**ABSTRACT** *Nepalomyia* Hollis and *Neurigonella* Robinson are synonymized. The genus *Nepalomyia* is more fully characterized and the Nearctic species are revised. *Nepalomyia nigricornis* (Van Duzee) and *N. sombrea* (Harmston & Knowlton) are reassigned and redescribed. Two new species, *N. dilaticosta* Runyon & Hurley and *N. hesperia* Runyon & Hurley, are described. New combinations are created for the following non-Nearctic species: *Nepalomyia bidentata* (Yang & Saigusa), *N. brevifurcata* (Yang & Saigusa), *N. crassata* (Yang & Saigusa), *N. daliensis* (Yang & Saigusa), *N. daveshiana* (Yang & Saigusa), *N. dentata* (Yang & Saigusa), *N. flava* (Yang & Saigusa), *N. furcata* (Yang & Saigusa), *N. henanensis* (Yang, Yang, & Li), *N. longa* (Yang & Saigusa), *N. longiseta* (Yang & Saigusa), *N. lutipileura* (Yang & Saigusa), *N. pallipes* (Yang & Saigusa), *N. pilifera* (Yang & Saigusa), *N. pingbiana* (Yang & Saigusa), *N. tatjanae* (Negrobov), *N. trifurcata* (Yang & Saigusa), *N. tuberculosa* (Yang & Saigusa), *N. yunnanensis* (Yang & Saigusa), and *N. zhouzhienensis* (Yang & Saigusa). A key to Nearctic males and females and a catalog of the world *Nepalomyia* are provided.

**KEY WORDS** Dolichopodidae, *Nepalomyia*, *Neurigonella*, taxonomic revision, catalog, key

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**SYSTEMATICS**

Materials and Methods

Specimen Handling. Almost exclusively, dry mounted material was studied. For examination and illustration, genitalia, abdomens, and heads were cleared using KOH, temporarily mounted in glycerin, and later transferred to polymere microtubes and attached to the corresponding specimens.

Discussion of Characters. Density of pollen is characterized as follows: very sparse, if surface not uniformly covered and apparently lacking pollen except when viewed obliquely; sparse, if pollen evidently present, but not noticeably modifying integument color; moderately dense, if pollen lending its own color generally to the surface, but not completely obscuring integument beneath; dense, if integument completely hidden by pollen.

In descriptions of male genitalia, “dorsal” and “ventral” refer to the true morphological position (as seen in illustrations). Because of similarities in the hypopygial structures of *Nepalomyia* to those of *Achaleus Loew*, we have followed Pollet and Cumming’s (1998) interpretation and terminology.

Abbreviations. The following abbreviations are used: *a*, anterior(ly); *ad*, anterodorsal(ly); *ac*, anteroveltral(ly); *p*, posterior(ly); *pd*, posterodorsal(ly); *pv*, posteroventral(ly); *ac*, acrostichal seta(e); *dc*, dorso-central seta(e); *T1*, *T2*, etc., abdominal tergum one, abdominal tergum two, etc.; *S1*, *S2*, etc., abdominal sternum one, abdominal sternum two, etc. Legs are designated by roman numerals, tarsomeres by bracketed arabic numerals (e.g., *Tarsus III(4) = fourth tarsomere of metathoracic leg*). The following acronyms for museums are used: AMNH, American Museum of Natural History, New York; BMNH, The Nat-
ural History Museum (formerly the British Museum (Natural History)), London; CAS, California Academy of Sciences, San Francisco, CA; CAU, China Agricultural University, Beijing, China; CNC, Canadian National Collection, Ottawa, Canada; FSCA, Florida State Collection of Arthropods, Gainesville, FL; KIZ, Kunming Institute of Zoology, Kunming, China; MTEC, Montana Entomology Collection, Bozeman, MT; USNM, United States National Museum of Natural History, Smithsonian Institution, Washington, D.C.; ZIN, Russian Academy of Sciences, Zoological Institute, St. Petersburg, Russia.

**Nepalomyia** Hollis 1964

*Nepalomyia* Hollis 1964: 110 (new species; key, Nepal); Dyte 1975: 254 (catalog, Oriental); Negrobov 1984: 1113 (possible synonym with *Neurigonella*). Type species: *Nepalomyia dytei* by original designation. *Neurigonella* Robinson 1964: 119 (key, Nearctic); Robinson 1970: 56 (subfamily placement); Robinson & Vockerot 1981: 634 (key to genera, Nearctic); Negrobov 1984: 1113 (new species); 1991: 31 (catalog, Palearctic); Poole & Gentili 1996: 146 (species list, Nearctic); Negrobov 1984: 1113 (new species); 1991: 31 (catalog, Palearctic); Poole & Gentili 1996: 146 (species list, Nearctic); Yang et al. 1998: 81 (new species); Yang 1998: 344 (new species); Yang & Saigusa 2000: 237 (new species); 2001a: 375 (new species; key to males, China); 2001b: 237 (new species). Type species: *Neurigonella nigricornis* Van Duzee by original designation. New synonym.

**Diagnosis.** Vertex not excavate. Scape without distinct setae on d surface. First flagellomere without setae. Arista long, pubescent, tapering to fine point, inserted in notch immediately lateral to apex of first flagellomere. Costa continuous to tip of M. M unsetae. Arista long, pubescent, tapering to fine point, tinct setae on distal margin. New synonym. *Neurigona nigricornis* (new species); 2001a: 375 (new species; key to males, Nearctic); Yang & Saigusa 2000: 237 (new species; key to males, Palearctic); Poole & Gentili 1996: 146 (species list, Nearctic); Negrobov 1984: 1113 (new species); 1991: 31 (catalog, Palearctic); Poole & Gentili 1996: 146 (species list, Nearctic); Yang et al. 1998: 81 (new species); Yang 1998: 344 (new species); Yang & Saigusa 2000: 237 (new species); 2001a: 375 (new species; key to males, China); 2001b: 237 (new species). Type species: *Neurigona nigricornis* Van Duzee by original designation. New synonym.

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Hypopygium bulbous, forming loose broadened cap to abdomen (Fig. 7). Epandrium with three setae (one Chinese species with long finger-like lobe bearing thick apical seta), the longest slender, pale, very long (subequal to hypopygium) (Figs. 10–14). Ventral process of epandrium with 0 (nigricornis) (Fig. 14), one (dilaticosta, sombrea) (Figs. 12 and 13), or two (hesperia) (Fig. 9) setae at or near apex. Surstylus deeply divided into two lobes, each with setae at apex (Figs. 10 and 14). Postgonite short, broad, usually with what appears to be a dense patch of “setal sockets” (or similar sensory structures) in mid-dorsal
area near apex (Figs. 10 and 13). Dorsal process of epandrium hyaline; very broad, narrowed at apex (best seen when viewed ventrally) (Figs. 10 and 14). Cercus not lamellate; with two large setae dorsally near one-half; trilobed apically (Figs. 10 and 14), the most medial lobe with variously sclerotized border and broad hyaline area medially (see Figs. 19–22). Extreme base of cercus with cercal papilla bearing three (*nigricornis*) (Fig. 14), five (*sombrea*) (Fig. 12), six (*hesperia*) (Fig. 9), or seven (*dilaticosta*) (Fig. 13)
Figs. 10–12.  (10) *N. sombrea*, apex of hypopygium (aedeagus not shown) (ventral view). (11) *N. sombrea* (New Mexico), ventral process of epandrium (lateral view). (12) *N. sombrea*, hypopygium (lateral view). Ce, cercus; Cem, medial lobe of cercus; Es, epandrial seta; Edp, dorsal process of epandrium; Evp, ventral process of epandrium; Hypa, hypandrium; pG, postgonite; pGS, postgonite “setal sockets”; Su, surstylus.
Figs. 13–14. (13) *N. nigricornis*, hypopygium (lateral view). (14) *N. dilaticosta*, hypopygium (lateral view). Aed, aedeagus; Ce, cercus; Cem, medial lobe of cercus; Cep, cercal papilla; Edp, dorsal process of epandrium; Es, epandrial seta; Evp, ventral process of epandrium; Hypa, hypandrium; pG, postgonite; pGS, postgonite "setal sockets."
setae at apex; with short, stout postpapillary seta just distal to papilla. Aedeagus very thick, broadened in distal quarter with lateral edges slightly serrate; apex narrowed, with broad “U”-shaped cleft (apex trifurcate in one Chinese species). Hypandrium symmetrical (Figs. 15 and 17) to distinctly asymmetrical (Fig. 18).

Female. Face wider than in male (=distance between lateral ocelli). T8 with heavily sclerotized lateral band. S8 with less sclerotized band which con-
nects with T8 band at a edge. S9 with dense, short triangular projections over most of d in-folded surface. Acanthophorites narrowly separated, each bearing four broad dornen and one short stout lateral seta. Cerci bilobed; d lobe long, acuminate, sclerotized, bearing series of setae ventrolaterally: one long at one-sixth, one medium length at five-sixth, remainder short; v lobe short, poorly sclerotized, bearing three long mediad directed setae (Fig. 23).

Remarks. The presence of three teeth on the apical epipharyngeal sclerite places *Nepalomyia* in “group II5” (containing only *Liancaulus Loew*), according to Satō 1991 (Satō examined only *L. zhuchzuri* Ne-grobov). However, examination of *L. genualis* Loew indicates only two teeth are present in this species (the middle tooth is lacking). The cross-banding evident on the proximal portion suggests “group I2”, and except for the middle tooth, bears a close resemblance to *Hercostomus Loew* (and other Dolichopodinae). Using Cregan’s (1941) classification, *Nepalomyia* belongs to “group X”, characterized by “labrum plate-like, with four prongs of epipharynx connected, and six panels genitally sclerotized in the labella” (“group X” also contains *Argyro Macquart, Campsicnemus Haliday, Hydrophorus Fallén, Liancaulus Loew, Peloropodes Wheeler, and Tachophorus Loew”).

Little sexual dimorphism is displayed in this genus. In addition to the complex genitalia and associated abdominal modifications, males differ from females only in the width of the face, the spur at the base of tarsus III(1), and the enlargement of the costa (dilaticosta).

The overall morphological homogeneity in the male genitalia and other structures (body color, leg color, shape of first flagellomere, dc number) of Nearctic *Nepalomyia* compared with that evident in the Chinese species suggests a single origin for the Nearctic fauna.

Biogeographically, *Nepalomyia* resembles *Diostracus Loew* (Dolichopodidae: Hydrophorinae) (Saigusa 1995) in global distribution and centers of diversity. In each genus, the Nearctic has a small number of relatively similar species found in restricted areas of mid-latitudes while the Oriental region has a large number of morphologically diverse species.

Our interpretation of the “cercus” follows that of Yang and Saigusa (2001) in descriptions of the Chinese species. One reviewer suggested that our “cercal papilla” is all that remains of the cercus and the remainder of our “cercus” is actually part of the surstylus complex. At this point, we agree that our interpretation is open to question.

*Nepalomyia* seems to be restricted to shaded habitats in which a thin film of water is running over moss-covered rocks.

*Nepalomyia dilaticosta* Runyon & Hurley, new species

(Figs. 2, 14–15, 19a–b)


Male. Length 3.2–3.5 mm. Face dark blue-green, with moderately dense blue-gray pollen. Front dark, with moderately dense yellow-gray pollen. Palpus and proboscis yellow-brown. Scape brown, yellow on dorsal edge; pedicel and first flagellomere brown. Scutum red-brown; prescutellar depression and scutellum darker; ac = 8, slender, medium-length (= one-third dc), in two distinct rows. Pleura dark brown, with moderately dense blue-gray pollen, paler along sutures. Lower two-thirds of metepimeron yellow. Humerus paler than surrounding sclerites. Ratio of tibia: tarsomeres = for leg I : 37–22–16–12–8–7; for leg II: 45–28–16–13–9–5; for leg III: 56–12–21–15–12–5. Tibia III with ad seta at one-fourth and just beyond one-half, with dense hair p and pv on apical one-half. Tarsus III(1–3) with longer (=width of tarsus III(3)) p setae. Abdomen dark brown with sparse gray pollen. Wing slightly broadened; costa with distinct sausage-shaped thickening between humeral crossvein and R5 (Fig. 2). CuA1 straight through last section. Halter yellow. Ventral process of epandrium with one small seta near apex. Ventral lobe of surstylus with short, broad lobe at two-thirds medially. Postgonite with patch of dense “setal sockets” in mid-dorsal area near apex. Dorsal process of epandrium with apex acuminate. Cercus with d setae at one-half large, tapering gradually to apex (Fig. 13). Medial lobe of left cercus asymmetrical, sessile (Fig. 19a); medial lobe of right cercus symmetrical, pedunculate (Fig. 19b). Cercal papilla with seven setae at apex (Fig. 13). Hypandrium symmetrical (Fig. 15).

Female. Unknown.

Remarks. The differing medial lobes of the right and left cerci is surprising. This description is based on a single specimen; we have examined genitalia of at least two specimens for each of the other three Nearctic species, and have found no right-left asymmetry in genitalic characters.

The female of *N. dilaticosta* is unknown. However, it probably has dark pleura, which will separate it from all other eastern species.


Etymology. The epithet, a noun in apposition, is derived from the Latin “dilatus” (=spread, expanded) + “costa” (L. = rib), and refers to the sausage-shaped enlargement of the costa.

*Nepalomyia hesperia* Runyon & Hurley, new species

(Figs. 3, 5, 7, 16, 20)

Nepalomyia nigricornis (Van Duzee), new combination
(Figs. 4, 6, 13, 17, 21)


Neurigonella nigricornis, Robinson 1964: 119 (key, Nearctic); Poole & Gentili 1996: 146 (species list, Nearctic).

Length 2–3.5 mm. Face dark blue-green, with moderately dense blue-gray pollen. Front black, with sparse to moderately dense, dark brown pollen, with paler pollen at base of antenna. Palpus and proboscis yellow-brown. Scape and pedicel yellow to brown; first flagellomere dark brown. Scutum red-brown; ac ~6, short (=one-third dc), in two distinct rows. Pleura including metepimera yellow, with sparse blue-gray pollen. Dorsal anepimeron and laterotergite dark. Humerus paler than surrounding sclerites. Tibia III with ad seta at one-fourth, with dense hair p and pv on apical one-half. Tarsi III(1–3) with longer (=width tarsomere III(2)) p setae. Halter with stem yellow, knob infuscated. CuA1 straight through last section. Abdomen brown with sparse gray pollen; abdominal sterna usually paler than terga.

Male. Ratio of tibia-tarsomeres = for leg I: 24–17–12–9–8–6; for leg II: 44–24–12–12–8–5; for leg III: 56–10–22–14–9–4. Ventral process of epandrium bare. Postgonite without patch of dense “setal sockets” in mid-dorsal area near apex. Dorsal process of epandrium with apex slightly clubbed. Cercus with d setae at one-half large, gradually tapering to apex (Fig. 9). Medial lobe of cercus asymmetrical, sessile (Fig. 21). Cercal papilla with three setae at apex (Fig. 14). Hypandrium symmetrical (Fig. 17).


Remarks. Van Duzee (1914) described N. nigricornis from three males. The face is often collapsed in dry specimens, hind Ant I and II. Inspection of additional material reveals that the color of the scape and pedicel varies from yellow to brown.

Nepalomyia nigricornis has often been collected with N. sombreia (Harmston & Knowlton), and other dolichopodids - Calyxochaetus frontalis (Loew), Gymnopternus frequens Loew, and G. subdilitatus Loew.

**Nepalomyia sombrea** (Harmston & Knowlton), new combination
(Figs. 1, 8, 10, 11, 18, 22)


*Neurigonna sombrea*, Robinson 1964: 119 (key, Nearctic); Poole & Gentilli 1996: 146 (species list, Nearctic).

Length 2–3.5 mm. Face dark metallic green-black, with moderately dense blue-gray pollen. Front dark brown, pale at base of antenna, with sparse brown pollen. Palpus and proboscis yellow-brown. Antenna (Fig. 1) yellow, first flagellomere darkened apically. Scutum orange-yellow, with very sparse blue-gray pollen, often darker medially; prescutellar depression darker medially; ac = 7/row, short (= one-third to one-half dc), in two distinct rows. Pleura including metepimeron yellow, with very sparse, pale pollen. Dorsal anepimeron and laterotergite dark brown. Humerus yellow. Halter yellow. 

**Male.** Ratio of tibiatarsomeres = for leg I: 44–23–20–16–12–6; for leg II: 46–36–20–17–12–6; for leg III: 76–16–32–20–13–5. Ventral process of epandrium with large seta at (Fig. 11, New Mexico) or near (Fig. 12, eastern United States) apex. Postgonite with patch of dense "setal sockets" in mid-dorsal area near apex. Dorsal process of epandrium with apex slightly clubbed. Cercus with d setae at one-half large, curved, broadened at one-half (Fig. 12). Medial lobe of cercus symmetrical, sessile (Fig. 22). Cercal papilla with five setae at apex (Fig. 12). Hypandrium strongly asymmetrical (Fig. 18).


**Remarks.** A disjunct population of *N. sombrea* occurs in southeastern New Mexico, and resembles the eastern populations except for the location of the seta on the ventral process of the epandrium. The New Mexico (River Cave, Carlsbad) and Georgia (Upper Valley Cave, Dade County) specimens were collected in caves.

*Nepalomyia sombrea* has commonly been collected by the authors with *N. nigricornis* (Harmston & Knowlton), and other dolichopodids - *Calyxochaeus frontalis* (Loew), *Gymnopternus frequens* Loew, and *G. sublittatus* Loew.

**Distribution.** U.S. east of 90° W, from Michigan to Georgia, including Indiana, Pennsylvania, Virginia, Tennessee, North Carolina with disjunct population in southeast New Mexico.

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**Key to the Nearctic Species of Nepalomyia**

<table>
<thead>
<tr>
<th>Males and Females</th>
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<tr>
<td>1. Ventral one-half of pleura pale yellow, similar to coxa II</td>
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<tr>
<td>2. First flagellomere yellow in anterior view</td>
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<tr>
<td>3. Costa with distinct sausage-shaped thickening between humeral crossvein and R7 (Fig. 2) (eastern)</td>
</tr>
</tbody>
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**Catalog of the World Nepalomyia**


*confusa* Hollis, 1964: 114, Fig. 47 (*Nepalomyia*). Holotype ♂ deposited BMNH. Type-locality: Nepal: Taplelung District: Sangu, c. 1900 m, September–October 1961, (R. L. Coe). Distribution: Nepal: Taplelung District.


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References Cited


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