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Two new species of *Neurigona* Rondani from northern and northeastern Brazil (Diptera, Dolichopodidae)

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ABSTRACT. Two new species of *Neurigona* Rondani from northern and northeastern Brazil (Diptera, Dolichopodidae)**.** Two new species of *Neurigona* Rondani (Diptera: Dolichopodidae) of the *brevitibia*-group are described from northern and northeastern Brazil: *N. lenae* **sp. nov.** and *N. manauara* **sp. nov.** A key to males of the *brevitibia*-group is provided.

KEYWORDS. Insecta; Neotropical region; Neurigoninae; taxonomy.

Members of the subfamily Neurigoninae (Diptera, Dolichopodidae) can be recognized by the following combination of characters: dorsal postcranium flat; sub-apical to dorsal arista-like stylus; face with dense pruinosity; proepisternum with setae; posterior slope of mesonotum flattened; legs elongate and bare of major setae; male abdominal segments 4 and/or 5 sometimes with ventral modifications; segment 7 bare, forming a peduncle; and hypopygium usually globular (Bickel 1998, 2009). They represent around 3% of the known diversity of Dolichopodidae, with 225 described species distributed in 16 genera. Nevertheless only *Neurigona* Rondani accounts for more than a half of this, with 155 known species (Yang *et al.* 2006; Wang *et al.* 2006, 2007, 2010, Grichanov 2010; Capellari & Amorim 2011).

In his revision of the Neotropical Neurigoninae, Naglis (2001a,b, 2002a,b, 2003) recognized 84 species placed in ten genera, and since then only a single monotypic genus was added to that fauna by Capellari and Amorim (2011). The Neotropical *Neurigona* comprise at present 39 valid species, and the genus can be recognized as follows: proboscis with pair of long ventral hairs; thorax usually ochreous-yellow with mesonotal depression and scutellum sometimes metallic green; midtibia with anterodorsal, posterodorsal and ventral setae; tarsomere 1 of midleg usually with strong setae; abdomen yellow, frequently with dark tergal bands; cercus with digitiform internal median projection (Naglis 2003; Bickel 2009). Naglis (2003) sustained *Neurigona* as a paraphyletic holding genus, but established species-groups as a basis for further phylogenetic analysis. Accordingly, only two species were previously ascribed to the *brevitibia*-group: *Neurigona brevitibia* Naglis, 2003 (from Venezuela, Peru and northern Brazil) and *N. cantareira* Naglis, 2003 (from southeastern Brazil). In this paper, two new species of *Neurigona* belonging to the *brevitibia*-group are described and an identification key to its included species is provided.

MATERIAL AND METHODS

The material used in this study belongs to the following collections (with their respective acronyms): Canadian National Collection, Ottawa, Canada (CNCI), Instituto Nacional de Pesquisas Amazônicas, Manaus, Brazil (INPA) and Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (MZSP). Label data for holotypes are cited verbatim in quotation marks (lines separated by " | "), and annotations in square brackets. The morphological nomenclature used here follows mainly Cumming and Wood (2009) and Naglis (2001a,b, 2002a,b, 2003) for hypopygial characters. Body length was measured from the insertion of the antenna to the tip of segment 7. Wing length was measured from the base to the apex of the wing, and the width, at the widest point of the wing, both given as ranges. Measurements for podomeres are representative ratios and are given according the formula: trochanter + femur, tibia, tarsomeres 1, 2, 3, 4, 5. CuAx ratio represents the proportion between the length of the dm-cu crossvein and the distal section of the cubital vein, while RMx ratio, that between the length between R_{2+3} and R_{4+5} and the length between R_{4+5} and M_1 at costal margin.

The following abbreviations are used in the description and figures: I, II, III: pro-, meso-, metathoracic legs; A_1, anal vein; C, costal vein; Cer, cercus; CuA, basal part of anterior branch of cubital vein; Cx, coxa; dm-cu, discal medial-cubital crossvein; DSur, dorsal lobe of surstylus; F, femur; Hyp, hypandrium; EpL, lateral epandrial lobe; M, medial vein; Pgon, postgonite; Ph, phallus; R, radial vein; St, sternite; T, tibia; Tg, tergite; t_{1-5}, tarsomeres 1 to 5; VSur, ventral lobe of surstylus. While describing the hypopygium, 'dorsal' and 'ventral' refer to the morphological position prior to genitalic rotation and flexion; as such, the top of drawings in lateral view is actually ventral in position on the specimens, and the bottom, dorsal. Photographs were taken using a Leica DC camera attached to a Leica MZ16 stereomicroscope (wing) and to a DM2500 trans-

mission microscope (antennae), mounted in AutoMontage software and worked in Photoshop CS4.

TAXONOMY

Neurigona Rondani

Neurigona Rondani, 1856: 142. Type species: *Musca quadrifasciata* Fabricius, 1781: 448 (by original designation).
Saucropus Loew, 1857: 41. Unnecessary new name for *Neurigona*.

Remarks. Delimitation of the genus prior to Naglis (2001a,b, 2002a,b, 2003) consisted of a large and heterogeneous assemblage of species with neurigonine-like characters (for a general description of the genus, see Naglis 2003). Indeed, several species of *Neurigona* were transferred to other genera of Neurigoninae in Naglis' revision. It is possible that even more species from outside the Neotropical region need to be treated elsewhere.

The *brevitibia*-group

Emended diagnosis (modified from Naglis 2003: 276). Achrosticals absent; dorsocentrals consisting of 3 strong setae and 0–2 shorter setae anteriad and restricted posteriad of mesonotal suture; dorsum of mesonotum densely covered with setulae, including anterior part of mesonotal depression (in both sexes); pre-sutural intra-alar seta reduced; TII with 2 antero-dorsal, 2 postero-dorsal, 1 antero-ventral, and 2 postero-ventral to ventral setae; IIt_1 with strong posterior seta; abdominal segment 5 without ventral projection. Distribution: from Venezuela to southeastern Brazil.

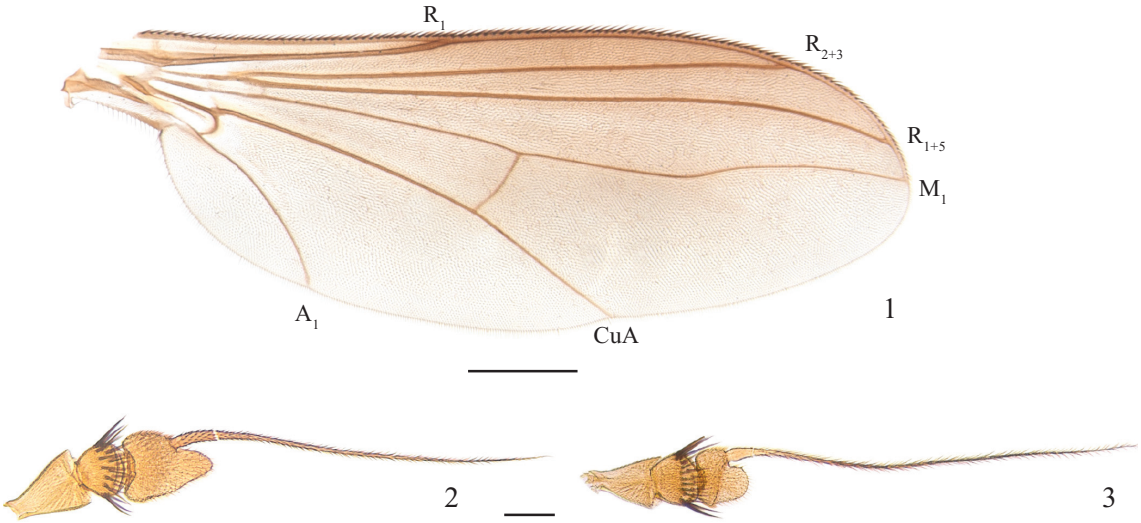
Key to males of the *brevitibia*-group of *Neurigona* (modified from Naglis 2003)

1. Achrosticals absent; dorsum of mesonotum with dense short setulae on anterior two-thirds, including anterior part of mesonotal depression; dorsocentrals consisting of 3 pairs of strong setae and 0–2 reduced setulae anteriad; abdominal segment 5 without ventral projection ..... *brevitibia*-group 2
1'. Achrosticals present in two rows; dorsum of mesonotum with short setulae on anterior one-third, mesonotal depression bare; dorsocentrals usually consisting of 6–7 pairs; abdominal segment 5 with or without ventral projection... ..... other Neotropical *Neurigona*
2. Ventral surface of all femora with rows of conspicuous setae; row of stout ventral setae from It_1 to base of It_3; genital capsule light yellow, somewhat translucent; dorsal lobe of surstylus three times longer than ventral lobe (Fig. 7) [northern Brazil] ..... *N. manauara* **sp. nov.**
2'. Ventral surface of all femora without rows of conspicuous setae; tarsus I without row of stout ventral setae; genital capsule brown, opaque; dorsal lobe of surstylus shorter than ventral lobe 3
3. Postpedicel triangular (Fig. 2); genital capsule brownish, dorsal lobe of surstylus with two long, curved setae, extending to cercus level (Fig. 4); cercus without median digitiform projection (Fig. 5) [northeastern Brazil] .... *N. lenae* **sp. nov.**
3'. Postpedicel squared to trapezoid; genital capsule dark, dorsal lobe of surstylus only with short setae, never extending to cercus level; cercus with median digitiform projection (Naglis 2003: figs. 1b, 2) 4
4. Only 3 pairs of strong dorsocentrals; ventral lobe of surstylus with spine-like apical seta; lateral epandrial lobe not projecting above ventral border of hypopygium (Naglis 2003: fig.1b) [Venezuela, Peru and northern Brazil] .... *N. brevitibia* Naglis
4'. Three pairs of strong dorsocentrals and 2 reduced setae anteriad; ventral lobe of surstylus with two leaf-like apical setae; lateral epandrial lobe projecting above ventral border of hypopygium (Naglis 2003: fig. 2) [southeastern Brazil] ..... *N. cantareira* Naglis

Neurigona lenae sp. nov.

(Figs. 1–2, 4–6)

Description. **Male.** Body length: 3.5–3.8 mm. Wing: 3.4–3.5 mm long, 1.1–1.2 mm wide. **Head.** Frons dark green, with little polinosity, around one-quarter of head width, slightly converging ventrally; face obliterated by contiguous eyes at middle, a small yellow triangle above and below; palpus yellow, covered by few brownish setulae, and some pale larger setae at apex; proboscis yellow with short whitish hairs; pair of divergent strong ocellar setae, almost twice longer than verticals; pair of short post-ocellar setae; pair of strong proclinate vertical setae; pair of slightly convergent paravertical setae, almost as long as verticals; post-oculars in a single row of pale setae, 3–5 dorsalmost black, the dorsalmost distinct longer than remaining; occiput metallic dark green, slightly concave. Antenna (Fig. 2) yellow, pedicel and postpedicel darker; pedicel with crown of apical setae, postpedicel subtriangular; stylus dorsally inserted with short pubescence, bi-articulate at base. **Thorax.** Dorsum of mesonotum ochreous-yellow, mesonotal depression dark brown with greenish reflections, scutellum light brown with some yellowish areas, remaining of pleura, including notopleuron, light yellow, except by a small black spot below wing insertion. Achrostical setae absent, dorsum of mesonotum, including anterior part of mesonotal depression, covered by short setae; dorsocentral setae reduced to 3 posterior strong pairs and 1–2 reduced pairs anteriad, posterior to transverse suture; 1 reduced pre- and 1 post-sutural intra-alar setae; 1 pre- and 1 post-sutural supra-alar setae; 1 long post-alar setae and 1 tiny hair anteriad; 2 notopleural setae; 1 strong post-pronotal seta and 3 tiny hairs; lower surface of proepisternum with 1 strong white seta below and 1 setula above; upper surface of proepisternum in front of anterior spiracle with 1 short white seta; scutellum with pair of strong median scutellars and 1 pair smaller laterad, about one-third



Figs. 1–3. 1–2: *Neurigona lenae* **sp. nov.**, male: 1, wing; 2, antenna. 3: *N. manauara* **sp. nov.**, male: antenna. Scale bars: 0.5 mm (1) and 0.1 mm (2 and 3).

as long as median scutellars. **Wing** (Fig. 1). Membrane hyaline, with brownish tinge anterior to R_{4+5}. C ending at wing apex; R_1 ending just before half of the wing; R_{2+3} straight, ending at the apical fifth of the wing; R_{4+5} slightly curved backwards; apical half of distal part of M_1 gently bent anteriorly; RMx ratio, 3.0; CuAx ratio, 0.4; A_1 strong, reaching wing margin. Lower calypter and cilia yellowish; stem of halter yellow, knob brownish yellow. **Legs.** I: 27, 28, 16, 10, 6, 3, 2. II: 33, 30, 31, 11, 7, 5, 3. III: 34, 46, 12, 17, 9, 6, 3. Mostly yellow, tarsi darkened. Pulvilli and claws present in all legs. Femora with short vestiture and devoid of major setae. **Leg I.** Anterior surface of CxI covered by short black setae, the ventralmost whitish, outer edge with long pale setae. **Leg II.** Anterior surface of CxII covered by black setae, outer edge with 1–2 pale setae; TII with 2–3 antero-dorsal, 2 postero-dorsal, 2–3 antero-ventral, 2 postero-ventral, and 3 apical setae; IIt_1 with 1 strong posterior seta at very base and some smaller scattered setae. **Leg III.** Lateral of CxIII with long black setae at basal one-quarter, sometimes with 2 tiny setae above; TIII with 3–4 more conspicuous dorsal setae and 3 apical setae. **Abdomen.** Mostly dark yellow, St1–5 paler. Tg2–5 with anterior dark brown bands on dorsum, widening in posterior tergites (anterior half in Tg2 and almost the entire tergite in Tg5), and covered by vestiture of black setae; Tg6 yellow with brownish dorsum, bare; Tg7 and St7 yellowish, bare; St8 brown, with two diagonal rows of white setae. **Hypopygium** (Figs. 4–6). Genital capsule, hypandrium and epandrial lobe brown, surstylus whitish. Hypandrium short, basally fused to epandrium. Epandrial lobe rugose at apex, with 2 apical setae, and an internal projection bearing 1 apical seta. Ventral lobe of surstylus with ventral curve projection bearing 1 long seta directed dorsally; two long joined setae, curved apically; inner wall of ventral lobe of surstylus with some hairs distally. Dorsal lobe of surstylus simple, subtriangular, shorter than ventral lobe. Postgonites extending outside genital capsule. Cercus with strong apical seta, ventrally curved. **Female.** Unknown.

Etymology. Named after my mother Maria Helena, amorously "Lena".

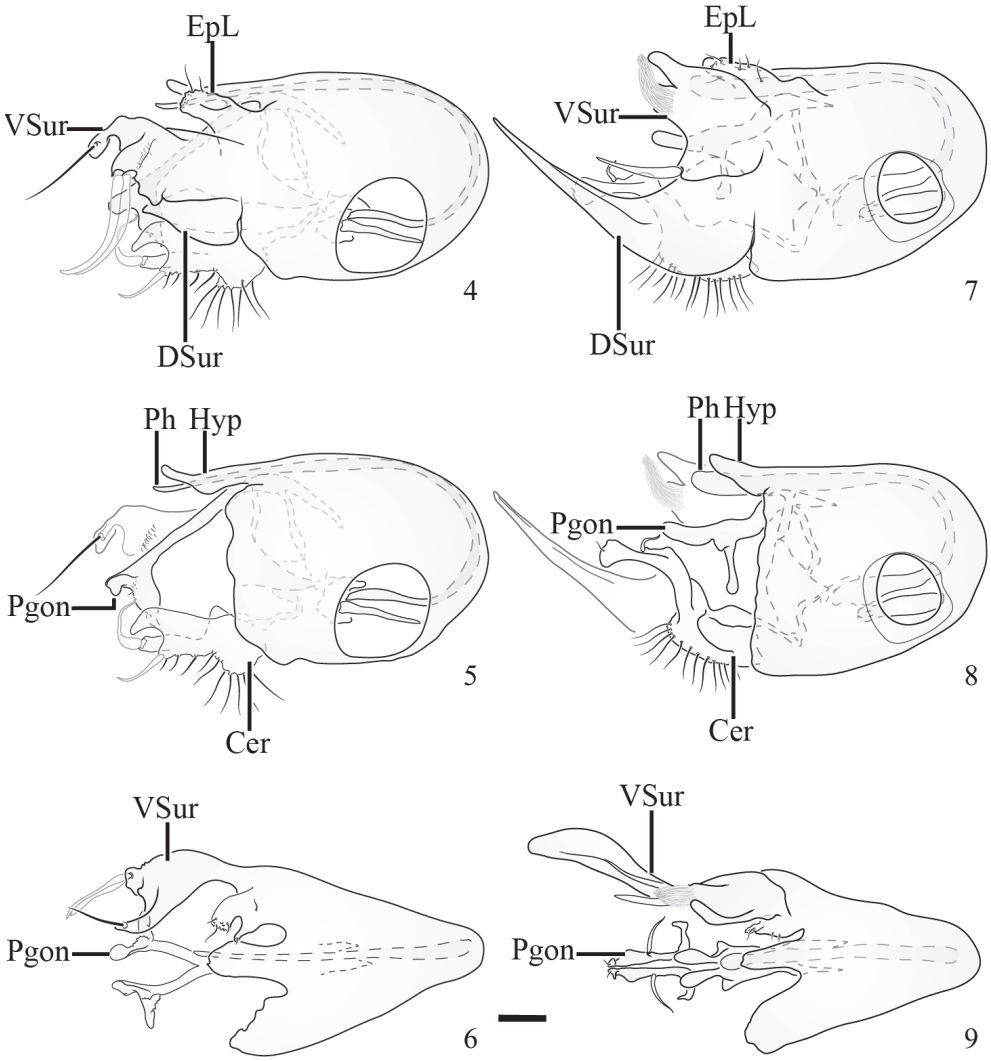
Remarks. *N. lenae* **sp. nov.** can be easily separated from the other species of the group by the triangular postpedicel. It is superficially similar to *N. brevitibia* and *N. cantareira*, but can be distinguished by its rugose epandrial lobe, long and curved setae on ventral lobe of surstylus and cercus without median projection.

Type material. Holotype male, "BIOTA-FAPESP [vertical line] | Brasil, PE [Pernambuco State], Recife | Parque dos Dois Irmãos | Malaise Trilha Ponto 5, 17–20.vii.2002 | S.T.P. Amarante e eq. cols.", "Neurigona | lenae | Capellari 2013 Holotype [red label]" (MZSP). Paratypes (all in MZSP, except when noted): 6 males, same data as the holotype; 6 males, same data, but "20–23.vii.2002"; 4 males, same data, but "trilha ponto 6, 17–20.vii.2002" (INPA); 2 males, same data, but "bosque ponto 5, 17–20.vii.2002" (INPA); 3 males, same data but "bosque ponto 3, 17–20.vii.2002" (CNCI); 4 males, same data, but "trilha ponto 4, 17–20.vii.2002" (INPA); 2 males, same data, but "trilha ponto 3, 17–20.vii.2002"; 1 male (mounted on slide), same data, but "bosque 4, 17–20.vii.2002".

Additional examined material. 1 male, Paraíba, João Pessoa, Campus Universitário (UFPB), 1–31.x.1987, malaise, D.S. Amorim & S.H.S. Tozoni leg. (MZSP).

Neurigona manauara sp. nov.
(Figs. 3, 7–9)

Description. **Male.** Similar to *N. lenae* **sp. nov.**, except as noted. Body length: 3.2–3.8 mm. Wing: 3.2–3.6 mm long, 1.1–1.3 mm wide. **Head.** Antenna (Fig. 3) wholly yellow; postpedicel trapezoid, ventral half shortly projected. **Thorax.** Dorsum of mesonotum ochreous-yellow, mesonotal depression and scutellum light brown, scutellum darker posteriorly, remaining of pleura, including notopleuron, light yellow. Dorsocentral setae reduced to 3 posterior strong pairs and 0–1 reduced pair anteriad, posterior to transverse suture; 1 strong post-pronotal seta and 2 tiny hairs. **Wing**. RMx ratio, 4.4; CuAx ratio, 0.4. Lower calypter and cilia yellowish; halter yellow,



Figs. 4–9. Male hypopygia of *Neurigona*. 4–6: *N. lenae* **sp. nov.**; 7–9: *N. manauara* **sp. nov.**; 4 and 7, left lateral; 5 and 8, left lateral, left surstylus removed; 6 and 9, ventral, right surstylus removed. Scale bar: 0.1 mm.

knob a little darker. **Legs.** I: 26, 27, 18, 11, 7, 4, 2. II: 32, 28, 31, 12, 9, 6, 3. III: 36, 46, 12, 18, 11, 7, 3. Mostly yellow, tarsi darkened, I and II from apex of It_1. Femora with short vestiture. **Leg I.** Anterior surface of CxI covered by short black setae, setae on outer edge and apico-lateral setae longer; ventral surface of FI with irregular rows of more conspicuous setae, as long as three-quarters diameter of femur; tarsus I with row of ventral stout setae from It_1 to base of It_3. **Leg II.** Anterior surface of CxII covered by black setae; FII with antero-ventral row of setae and a row of longer, as long as diameter of femur, ventral setae on basal half; TII with 2 antero-dorsal, 2 postero-dorsal, 1–2 antero-ventral, 1 ventral, and 3–4 apical setae; IIt_1 with one more conspicuous posterior seta at very base and some smaller scattered setae. **Leg III.** Lateral of CxIII with long black setae at basal one-quarter, sometimes with 2 tiny setae above; basal half of FIII with antero-ventral row of setae decreasing in size towards apex (longest ones a little longer than diameter of femur); TIII with 5–6 more conspicuous dorsal setae and 3 apicals. **Abdomen.** Mostly dark yellow, St1–5 paler. Anterior half of Tg2–3 with two lateral dark brown bands extending dorsally, in Tg3 almost contiguous; Tg4–5 dark brown, only a posterior yellow strip; Tg6–7 and St7 yellow and bare; St8 yellow, with two diagonal rows of pale setae. **Hypopygium** (Figs. 7–9). Genital capsule mainly light yellow, somewhat translucent in some specimens. Hypandrium short, basally fused to epandrium. Epandrial lobe rugose at apex, covered by short setae. Ventral lobe of surstylus divided into three lobes: ventral bare, medial with bush-like comb of setae, dorsal with strong apical seta. Dorsal lobe of surstylus three times longer than ventral lobe, tapering apically. Postgonites extending outside genital capsule, bifurcate at apex. Cercus with median projection, with 1 apical and 1 stronger lateral seta. **Female.** Unknown.

Etymology. Toponymic, meaning "from Manaus".

Remarks. *N. manauara* **sp. nov.** is distinctive from all other species of the group by the femora with antero-ventral rows of setae, row of stout ventral setae from It_1 to base of It_3 and by genitalic features.

Type material. Holotype male, "BRASIL, AM [Amazonas], Manaus | Res. km 41 | PDBFF, Trilha J I-SB | 07–08.vii.2004 | R. Querino col.", "Neurigona | manauara | Capellari 2013 Holotype [red label]" (INPA). Paratypes (all in INPA, except when noted): 7 males (1 mounted in slide), same data as the holotype; 7 males, same data, but "trilha C I–SB, 07–08.vii.2004"; 2 males, same data, but "trilha AB B–SB, 16–17.ii.2005"; 4 males, same data, but "trilha LL B–SB, 16–17.ii.2005"; 2 males, same data, but "trilha LL I–SB, 24–25.xi.2004"; 2 males, same data, but "trilha LL B–SB, 02–04.ii.2005"; 4 males, same data, but "trilha LL B–SB, 24–25.xi.2004" (CNCI); 3 males same data, but "trilha C B–SB, 16–17.ii.2005" (MZSP); 2 males, same data, but "trilha AB B–SB, 07–08.vii.2004" (MZSP); 3 males same data, but "trilha AB B–SB, 30.iii–01.iv.2005" (MZSP); 2 males, same data, but "trilha R I–SB, 07–08.vii.2004"; 3 males same data, but "trilha AB B–SB, 16–18.iii.2005"; 2 males, same data, but "trilha LL B–SB, 22.xii.2004–07.i.2005"; 1 male (mounted in slide) same data, but "trilha EE I–SB, 24–25.xi.2004" (MZSP).

DISCUSSION

Diagnostic characters provided by Naglis (2003) for the *brevitibia*-group included modified thoracic and leg setation, abdominal segment 5 without ventral projection and ventral lobe of surstylus with short curved apical tip. All but configuration of surstylus are present in the newly described species. Indeed, *N. brevitibia* and *N. cantareira* share very similar hypopygial morphology, both with ventral lobe of surstylus with curved apex bearing 1–2 flattened setae, assumed by Naglis (2003: figs. 1b and 2) to be diagnostic for the group at that time. Although *N. lenae* **sp. nov.** has two joined setae on ventral lobe of surstylus, its configuration is quite distinct and as such the shape of surstylus can no longer be considered diagnostic for the *brevitibia*-group. On the other hand, thoracic chaetotaxy is not only diagnostic but also likely synapomorphic for the entire group. Absent acrostichals and reduction of both dorsocentrals and intra-alar setae possibly form a set of dependent characters, once similar features also evolved elsewhere, like in the Oriental *N. angulata* de Meijere, with quadriserial acrostichals, anteriorly reduced dorsocentrals, and reduced supra-alar seta (Grootaert 2009). Similarly, the genera of Coeloglutini *Coeloglutus* Aldrich, *Neotonnoiria* Robinson, and *Mberu* Capellari & Amorim all have anteriorly reduced dorsocentrals and pre-sutural intra-alar seta reduced or lost (Naglis 2001a; Capellari & Amorim 2010). Nevertheless the modified thoracic chaetotaxy as seen in the *brevitibia*-group is uniquely acquired and hence a reliable synapomorphy for all species.

Furthermore, additional comments regarding hypopygial morphology can be made, particularly on the shape of postgonites. In the Palearctic *Neurigona quadrifasciata* Fabricius, postgonites are elongate and delicate structures connected basally and bifurcate at apex, covered by microtrichia (see Ulrich 1974: fig. 34, as "Appendix dorsalis"). This condition is present in at least some other Palearctic species, such as *N. anomaloptera* Negrobov, *N. flavella* Negrobov, *N. kasparyani* Negrobov, *N. pullata* Negrobov, and *N. unicinata* Negrobov (see figures in Negrobov 1987 and Negrobov & Fursov 1988). A similar configuration is found in the genus *Medetera* Fischer von Waldheim, as figured for some Nearctic species by Bickel (1985, as "bottle-brush-like aedeagal projection"): *Medetera aldrichii* Wheeler, *M. maura* Wheeler, *M. neomelancholica* Bickel, *M. pinicola* Kowarz and *M. vidua* Wheeler. Assuming Neurigoninae and Medeterinae as being closely related taxa (*e.g.*, Robinson 1970; Bickel 1985), delicate postgonites covered by microtrichia (only apically in *Medetera*) could be traced back to the common ancestor of both subfamilies. Postgonites in *N. lenae* **sp. nov.** and *N. manauara* **sp. nov.** (Figs. 5 and 8) are visibly more sclerotized than in Palearctic species, and so are in *N. cantareira* (holotype examined, MZSP), but shorter. A more detailed survey of this character through Neotropical *Neurigona* can clarify its distribution and check if the condition seen in the *brevitibia*-group is indeed synapomorphic.

As initially defined by Naglis (2003), the *brevitibia*-group probably constitutes as a pair of sister-species, both with very similar overall habitus and hypopygial morphology. In spite of the emended diagnosis here provided for the *brevitibia*-group, few modifications are needed to accommodate the new species, and the group likely still composes a clade within *Neurigona*, as indicated by thoracic chaetotaxy.

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REFERENCES

Bickel, D.J. 1985. A revision of the Nearctic *Medetera* (Diptera: Dolichopodidae). **United States Department of Agriculture Technical Bulletin 1692**: 1–109.

Bickel, D.J. 1998. The Dolichopodidae (Diptera) of Midway Atoll, with a new species of *Dactylomyia* Aldrich, and taxonomic notes on the subfamily Neurigoninae. **Bishop Museum Occasional Papers 55**: 45–55.

Bickel, D.J. 2009. Dolichopodidae (long-legged flies), p. 671–694. In: Brown, B.V., Borkent, A., Cumming, J.M., Wood, D.M., Woodley, N.E. & Zumbado, M.A. (eds). **Manual of Central American Diptera 1**. Ottawa, NRC Research Press, 714 p.

Capellari, R.S. & Amorim, D.S. 2011. *Mberu*, a new neurigonine genus from southeastern Brazil (Diptera: Dolichopodidae). **Zootaxa 3101**: 38–46.

Cumming, J.M. & Wood, D.M. 2009. Adult morphology and terminology, p. 9–50. In: Brown, B.V., Borkent, A., Cumming, J.M., Wood, D.M., Woodley, N.E. & Zumbado, M.A. (eds). **Manual of Central American Diptera 1**. Ottawa, NRC Research Press, 714 p.

Fabricius, J.C. 1781. **Species insectorum exhibentes eorum differentias specificas, synonyma auctorum, loca natalia, metamorphosin adiectis observationibus, descriptionibus.** Tom. 2, Hamburg et Kiel, Impensis Carol. Ernest. Bohnii, 517 p.

Grichanov, I.Ya. 2010. West-Palearctic species of the genus *Neurigona* Rondani (Diptera: Dolichopodidae). **Russian Entomological Journal 19**: 249–256.

Grootaert, P. 2009. Oriental Diptera, a challenge in diversity and taxonomy, p. 197–226. In: Pape, T., Bickel, D., & Meier, R. (eds). **Diptera Diversity: Status, Challenges and Tools**. Leiden, Koninklijke Brill NV, xx+495 p.

Loew, H. 1857. Neue Beiträge zur Kenntniss der Dipteren. Fünfter Beitrag. **Programme der Königlichen Realschule zu Meseritz 1857**: 1–56.

Naglis, S.M. 2001a. Revision of the Neotropical Neurigoninae (Diptera: Dolichopodidae) I: *Coeloglutus* Aldrich, *Neotonnoiria* Robinson, and *Paracoeloglutus* gen. nov., with the definition of the tribe Coeloglutini stat. nov. **Studia Dipterologica 8**: 189–206.

Naglis, S.M. 2001b. Revision of the Neotropical Neurigoninae (Diptera: Dolichopodidae) II: *Argentinia* Parent, *Dactylomyia* Aldrich, *Macrodactylomyia* gen. nov, and *Systenoides* gen. nov., with the definition of a new tribe Dactylomyiini. **Studia Dipterologica 8**: 475–504.

Naglis, S.M. 2002a. Revision of the Neotropical Neurigoninae (Diptera: Dolichopodidae) III: *Bickelomyia* gen. nov., with the definition of a new tribe Neurigonini. **Studia Dipterologica 9**: 225–241.

Naglis, S.M. 2002b. Revision of the Neotropical Neurigoninae (Diptera: Dolichopodidae) IV: *Viridigona* gen. nov. **Studia Dipterologica 9**: 561–604.

Naglis, S.M. 2003. Revision of the Neotropical Neurigoninae (Diptera: Dolichopodidae) V: *Neurigona* Rondani. **Studia Dipterologica 10**: 267–314.

Negrobov, O.P. 1987. New Palaearctic species of the dolichopodid flies of the genus *Neurigona* Rond. (Diptera, Dolichopodidae). **Entomologicheskoye Obozreniye 66**: 406–415.

Negrobov, O.P. & Fursov, V.N. 1988. Revision of species of the genus *Neurigona* Rond. (Diptera, Dolichopodidae) of Palaearctic II. **Entomologicheskoye Obozreniye 67**: 405–416.

Robinson, H. 1970. The subfamilies of family Dolichopodidae in North and South America (Diptera). **Papéis Avulsos de Zoologia 23**: 53–62.

Rondani, C. 1856. **Dipterologiae Italicae prodromus: 1: Genera Italica ordinis dipterorum ordinatim disposita et distincta et in familias et stirpes aggregata**. Parma, Stocchi, 228 p.

Ulrich, H. 1974. Das Hypopygium der Dolichopodiden (Diptera): Homologie und Grundplanmerkmale. **Bonner Zoologische Monographien 5**: 1–60.

Wang, M.Q., Yang, D. & Grootaert, P. 2006. A peculiar new species of *Neurigona* (Diptera: Dolichopodidae) from North China, Palaearctic region. **Bulletin de l'Institut Royal des Sciences Naturelles de Belgique, Entomologie 76**: 87–91.

Wang, M.Q., Yang, D. & Grootaert, P. 2007. Notes on *Neurigona* Rondani (Diptera: Dolichopodidae) from Chinese mainland. **Zootaxa 1388**: 25–43.

Wang, M.Q., Chen, H. & Yang, D. 2010. New species of the genus *Neurigona* (Diptera: Dolichopodidae) from China. **Zootaxa 2517**: 53–61.

Yang, D., Zhu, Y., Wang, M. & Zhang, L. 2006. **World Catalog of Dolichopodidae (Insecta: Diptera).** Beijing, China Agricultural University Press, 704 p.

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