

New species of *Boreofairchildia* Wagner & Stuckenberg, 2016 (Diptera: Psychodidae) from Brazil

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Abstract. *Boreofairchildia* Wagner & Stuckenberg, 2016 (Diptera: Psychodidae) currently includes fourteen acknowledged species. This genus is mainly found in the Neotropical region, although one species has been described from the Nearctic area. Two species are known Brazil, both from the state of Espirito Santo. In this paper, a new species from the Atlantic Forest of Espirito Santo is described, increasing the total number of Brazilian species to three and the overall species count in the genus to fifteen.

Keywords: Atlantic Rain Forest; Bruchomyinae; Espirito Santo state; Moth-Flies; Neotropics.

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Boreofairchildia Wagner & Stuckenberg, 2016 (Diptera: Psychodidae: Bruchomyiinae), is a genus of American Bruchomyiinae. This genus encompasses 14 extant species, distributed across North, Central, and South America. In North America, one species has been recorded in United States (Florida) and the Bahamas; six species have been recorded from Central America with records in Mexico, Guatemala, Belize, Costa Rica, Nicaragua, and Panama; in South America, five species are known from Brazil, Colombia, Ecuador and Venezuela; two species are known from Caribbean islands, both restricted to the Dominican Republic (Wagner & Stuckenberg 2016; Ježek *et al.* 2018; Santos *et al.* 2021). Within Brazil, two species have been formally described: *Boreofairchildia alexanderi* Santos, Brazil & Pinto, 2021 and *Boreofairchildia scheveni* (Wagner, 2006), preserved in Dominican amber (Wagner & Stuckenberg 2016).

In this study, a new species of Boreofairchildia from Espirito Santo state, Brazil, is described.

MATERIAL AND METHODS

Specimens of the new species were treated with 10% potassium hydroxide (KOH) at 40°C, neutralized with 10% acetic acid, dehydrated in ethanol, cleared in clove oil, and mounted in Canada balsam on microscope slides. The specimens are deposited in the entomological collection of Prof. Johann Becker at the Museu de Zoologia da Universidade Estadual de Feira de Santana (MZFS), Brazil.

General morphological terminology follows Cumming & Wood (2017), while specific terminology for Psychodidae follows Kvifte & Wagner (2017). Illustrations of the specimens were made using a camera lucida adapted to a Leica DM750 microscope. Additional information not included on the collection label or from the original descriptions was added in square ([]) brackets.

RESULTS AND DISCUSSION

Boreofairchildia mairae Bravo sp. nov.

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Type material. Holotype male: Brazil, Espírito Santo, Brejetuba, Cór [córrego] Vargem Alegre, 03.VIII.2010, Santos, C.B. col. (MZFS). Paratypes: 3 males with the same data as the holotype (MZFS); 3 females with the same data as the holotype (MZFS).

Etymology. The species is named in honor of Maíra Xavier Araújo for her significant contributions to the taxonomy of Psychodidae

Diagnosis. Veins R₂, R₃, M₁, M₂ and CuA not reaching the wing margin. Male abdomen with patches of long setae laterally in tergites III to VII and sternite VI with oval patch of sensilla on medial at its anterior margin. Male terminalia with gonocoxite approximately with the same length of ejaculatory apodeme; aedeagus bifurcated with the same length of gonocoxite; parameres fused basally with gonocoxal apodemes and taper apically, longer than the length of the gonocoxites, with two serrulate areas at the tip. Genital furca of female terminalia with anterior margin U-shaped; subgenital plate pentagonal, with a basal margin shaped

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like an inverted U and two apical lobes wider than the cercus.

Description. Male. Length, in lateral view, from the anterior margin of the prescutum (thorax) to the posterior end of terminalia: 4.5–5.3 mm (n=4). Wing length: 3.9–4.2 mm (n=4). Eyes separated by, approximately 2.4 facet diameters; frontal area with 27–38 setae alveoli (Figure 1A). The antenna of the holotype presents 14 flagellomeres, paratypes with antenna incomplete; length of flagellomeres 2 + 3 combined 1.9 times the length of flagellomere 1 (Figure 1B); ascoids not observed. Palpus formula: 1.0:2.0:2.5:2.0:7.7 (Figure 1C); sensilla not observed in the segments of palpus; apical segment of palpus striated (Figure 1C). Wing (Figure 1D) with Sc ending before level of radial fork, reaching C; crossvein sc-r absent; R_{2+3} longer than R_2 ; base of R_5 without spur; veins R_2 , R_3 , M_1 , M_2

and CuA not reaching the wing margin; crossvein r-m faint, basal to medial fork; M_3+M_4 with incomplete base; medial fork basal to radial fork. Coxa I with two patches of sensilla in the posterior area, the first proximal and the other distal; coxa II with two small patches of sensilla, the first in the proximal, posterior area, and the other in external medial area; another group of sparse sensilla is present in internal, distal area; coxa III with patch of sparse sensilla in the external, distal area; (Figure 1E). Abdomen with patches of long setae laterally in tergites III to VII (Figure 1F); oval patch of sensilla on medial, anterior margin of sternite V (Figure 1G). Male terminalia: hypandrium as a narrow band, not fused to gonocoxites (Figure 2A); gonocoxite approximately with the same length of ejaculatory apodeme (Figure 2A); gonostylus shorter than



Figure 1. Boreofairchildia mairae **sp. nov.** Male: A – Head, frontal view; B – Antenna, scape, pedicel, three basal flagellomeres and two apical flagellomeres; C – Palpus, the fifth segment of the palpus is longer than the other segments; D – Wing; E – Coxas of thoracic segments I, II and III; F – Tergite V; G – Sternite V.



Figure 2. Boreofairchildia mairae **sp. nov.** Male terminalia: A – Dorsal, ejaculatoy apodeme, hypandium gonocoxites, gonostyli, aedeagus and parameres; B – Parameres and aedeagus; C – Epandrium, cerci and hypoproct; Female terminalia: D – ventral, subgenital plate, genital furca and cerci.

the gonocoxite, approximately 0.7 times its length; its apex with concave internal margin and ending in a pointed tip; distal mid-apical margin of gonostyle slightly folded, forming a narrow fringe (Figure 2A); aedeagus bifurcated with the same length of gonocoxite and approximately 0.8 times the length of ejaculatory apodeme (Figures 2A-B); the aedeagus is encapsulated by a sub-pyramidal sheath with truncated apex (Figures 2A-B); a triangular patch of sclerotized, small projections teeth-like is present at the dorsal base of the sheath (Figure 2A); at apex of this sheath, on each margin, there is a group of small setae (Figure 2B); parameres fused basally with gonocoxal apodemes and taper apically, measuring 1.6 times the length of the gonocoxites, with two serrulate areas at the tip (Figures 2A-B); ejaculatory apodeme narrow, tubular, elongated anteriorly (Figure 2A); epandrium longer than wide, trapezoidal, wider basally than apically (Figure 2C); cerci subelliptical in ventral view (Figure 2C); hypoproct lobe-like, rounded at apex (Figure 2C).

Female. Length from thorax to the posterior end of terminalia: 4.6–5.1 mm (n=3). Wing length: 3.6–3.8 mm (n=3). Similar to male except as follows: palpus incomplete in all specimens, one specimen with only four segments: 1.0: 1.8: 2.4: 3.4; female terminalia (Figure 2D): genital furca with anterior margin U-shaped (Figure 2D); cercus narrow, digitiform, with a long seta; subgenital plate pentagonal, with a basal margin shaped like an inverted U and two apical lobes wider than the cercus, finger-shaped, 0.4 times the length of the subgenital plate and is very light in all specimens.

Remarks. A distinguishing feature of the new species, *B*. mairae **sp. nov.**, in both males and females, is that many of the longitudinal veins do not reach the margin of the wing. Additionally, the new species differs from most Boreofairchildia species by the absence of large lobes at the apex of the gonostylus. A gonostylus similar to that of the new species is observed in three species: B. parva, Boreofairchildia patriciae (Alexander, 1987), and Boreofairchildia youngi (Wagner, 1999). It differs from B. parva, also described from the state of Espirito Santo, Brazil, by the absence of patches of long setae laterally on the inner margin of the gonocoxite, which are present in B. parva, and by the size of the parameres, which are longer than the gonocoxite in the new species and shorter than the gonocoxite in B. parva. The new species differs from B. patriciae, described from Colombia, primarily by the shape of the aedeagus, which is Y-shaped with spiny apical arms. Finally, the new species differs from B. youngi mainly by the absence of small, tooth-like projections on the distal surface of the aedeagus, which are present in B. youngi; in the new species, these small projections are present at the base.

Notofairchildia dissimilis (Barretto & d'Andretta, 1946) is another species that is morphologically similar to *B. mairae* **sp. nov.**, which was also described from Espirito Santo, Brazil, like the new species. The wing venation is similar between the two species; however, all longitudinal veins reach the margin of the wing in *N. dissimilis*. The relative size of the parameres, larger than the length of the gonocoxites, as well as their shape-broad at the base and tapering towards the apexis similar in both species; however, Barretto & d'Andretta (1946) did not mention if the parameres are fused on the anterior surface. Another similar aspect is the relative size of the aedeagus, approximately 0.8 times the length of the ejaculatory apodeme. On the other hand, the aedeagus of *N. dissimilis* has a fringed apex, which is not present in the new species.

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TAXONOMIC AUTHORITIES

Boreofairchildia Wagner & Stuckenberg, 2016 in Wagner & Stuckenberg (2016); Boreofairchildia alexanderi Santos, Brazil & Pinto, 2021 in Santos et al. (2021); Boreofairchildia parva (Santos, Falqueto & Bravo, 2013) in Santos et al. (2013); Boreofairchildia scheveni (Wagner, 2006) in Wagner (2006); Boreofairchildia patriciae (Alexander, 1987) in Alexander (1987); Boreofairchildia dissimilis (Barretto & d'Andretta, 1946) in Barretto & d'Andretta (1946).

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CONFLICT OF INTEREST STATEMENT

The author declares no competing interests.

REFERENCES

Alexander, JB (1987). A new species of *Nemopalpus* (Diptera; Psychodidae; Bruchomyiinae) from northeastern Colombia. *Florida Entomologist*, 70(3): 376–381. https://doi.org/10.2307/3495071

- Barretto, MP & d'Andretta, MAV (1946). Observações sobre subfamília Bruchomyiinae Alexander, 1920 com a descrição de quatro novas espécies (Diptera: Psychodidae). *Livro Homenagem Romualdo Ferreira d'Almeida*, Sao Paulo.
- Cumming, JM & Wood, DM (2017). 3. Adult morphology and terminology, pp 89–133. In: Kirk-Spriggs AH & Sinclair, BJ (Eds.), *Manual of Afrotropical Diptera*. Vol. 1. Suricata 4. South African National Biodiversity Institute, Pretoria.
- Ježek, J; Oboňa, J; Le Pont, F; Maes, J & Mollinedo, S (2018). Two new species of Bruchomyiinae (Diptera, Psychodidae) from the Neotropical Region. *Zootaxa*, 4442(3): 469–47. https://doi.org/10.11646/zootaxa.4442.3.8
- Kvifte, G.M. & Wagner, R. (2017). Psychodidae (sand flies, moth flies or owl flies), pp. 607–632. In: Kirk-Spriggs, AH & Sinclair, BJ (Eds.), *Manual of Afrotropical Diptera*. Vol. 2. Nematocerous Diptera and lower Brachycera. Suricata, 5. South African National Biodiversity Institute.
- Santos, CB; Brazil, RP & Pinto, IS (2021). New species of Boreofairchildia Wagner & Stuckenberg and Laurenceomyia Wagner & Stuckenberg (Diptera: Psychodidae: Bruchomyiinae) from Brazil. Zootaxa, 4974(2): 391–395. https://doi.org/10.11646/zootaxa.4974.2.8
- Santos, CB; Falqueto, A & Bravo, F (2013). A new species of *Nemopalpus* Macquart (Diptera, Psychodidae) from Brazil. *Revista Brasileira de Entomologia*, 57(4): 374–376. https://doi.org/10.1590/S0085-56262013005000037
- Wagner, R (1999). Psychodidae from the Dominican Republic: records and descriptions of new species (Insecta: Diptera). *Journal of the Kansas Entomological Society*, 72(2): 233–245.
- Wagner, R (2006). Amber Bruchomyiinae descriptions of already known and new species, and the position of the 'subfamily' within Psychodidae (s.l.) (Diptera). *Studia dipterologica*, 13: 83–95.
- Wagner, R & Stuckenberg, BH (2016). Cladistic anlysis of subfamily Bruchomyiinae (Diptera: Psychodidae). *Zootaxa*, 4092(2): 151–174. https://doi.org/10.11646/ zootaxa.4092.2.1

