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Scientific Note

Wallacean shortfall: new records of *Triplocania* Roesler, 1940 (Psocodea: 'Psocoptera': Ptiloneuridae) for Brazil

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Abstract. *Triplocania* Roesler, 1940 has a high rate of endemism per country, with only five species out of a total of 118 described species, occurring in more than one country. Brazil is the second most diverse country in terms of *Triplocania* species, with 34 species recorded. In this paper, *Triplocania furcatoides* González-Obando, Carrejo-Gironza & García Aldrete, 2017 was recorded for Brazil and new records of *Triplocania furcata* New, 1972 made for four Brazilian states (Amazonas, Pará, Roraima and Tocantins), thus decreasing Wallace shortfall of these two species.

Keywords: Epipsocetae, Neotropics, Psocids, Taxonomy.

Triplocania Roesler, 1940 is one of 11 recent genera in the psocopteran family Ptiloneuridae and constitutes the most species rich genus of this family. It presently includes 118 described species, and these are distributed in Mexico, Guatemala, Belize, Costa Rica, Bolivia, Colombia, Peru, Ecuador and Brazil. Presently, Colombia and Brazil are the countries with the highest species richness of *Triplocania*; of the total number of species, 59 and 34 correspond to Colombia and Brazil, respectively (González-Obando et al. 2021; Moura-Lima et al. 2021). The level of endemism by country is high, with only five *Triplocania* species shared, as follows: *Triplocania erwini* Silva-Neto, Rafael & García Aldrete, 2015 shared by Colombia & Ecuador; *Triplocania furcata* New, 1972; *Triplocania lamasi* Silva-Neto, Rafael & García Aldrete, 2014; *Triplocania lamasoides* Silva-Neto, Rafael & García Aldrete, 2015 shared by Brazil and Colombia and *Triplocania spinosa* Mockford, 1957 shared by Guatemala and Mexico (González-Obando et al. 2021). Brazil is formed by 26 states and a Federal District. The Brazilian species of *Triplocania* have been recorded in 12 of these states (Silva-Neto & García Aldrete 2020). Of a total of 34 *Triplocania* species recorded in Brazil, 24 species have geographical records restricted to their type localities, with only eight species with records shared by at least two Brazilian states and two species shared between Brazil and Colombia, as mentioned previously. Wallacean shortfall is a concept used to refer to our lack of knowledge of species distributions (Hortal et al. 2015) and clearly the distribution of Brazilian species of *Triplocania* has this deficiency. *Triplocania furcatoides* González-Obando, Carrejo-Gironza & García Aldrete, 2017 is recorded only for the Colombian state of Amazonas. *T. furcata* was recorded only for its type locality in the Brazilian state of Mato Grosso, but González-Obando et al. (2017) registered this species for the Amazonas state in Colômbia. The purpose of this paper is to report the presence of *T. furcatoides* in Brazil, particularly in the Brazilian state of Roraima, and announce new records of *T. furcata* for the Brazilian states of Amazonas, Pará, Roraima and Tocantins, as well as a new record for another locality in the Brazilian state of Mato Grosso.

A total of 18 males and six females of *T. furcata* and 15 males of *T. furcatoides* were available for study. The specimens were dissected in 80% ethanol and their parts (head, right legs and wings, and genitals) were mounted in Canada balsam. Photographs of the parts mounted were taken with a Leica DFC500 digital camera attached to a Leica M205C stereomicroscope, connected to a computer with the Leica Application Suite LAS V3.6 software, which includes an Auto-Montage module (Syncroscopy software). The specimens studied were stored in CD boxes, according to Silva-Neto et al. (2016). The distribution map was generated on the website QGIS Geographic Information System (QGIS 2022). The specimens will be deposited in the Invertebrate Collection of the Instituto Nacional de Pesquisas da Amazônia (INPA), in Manaus, Amazonas, Brazil, whose curator is José Albertino Rafael.

Species List

Psocomorpha Badonnel, 1951

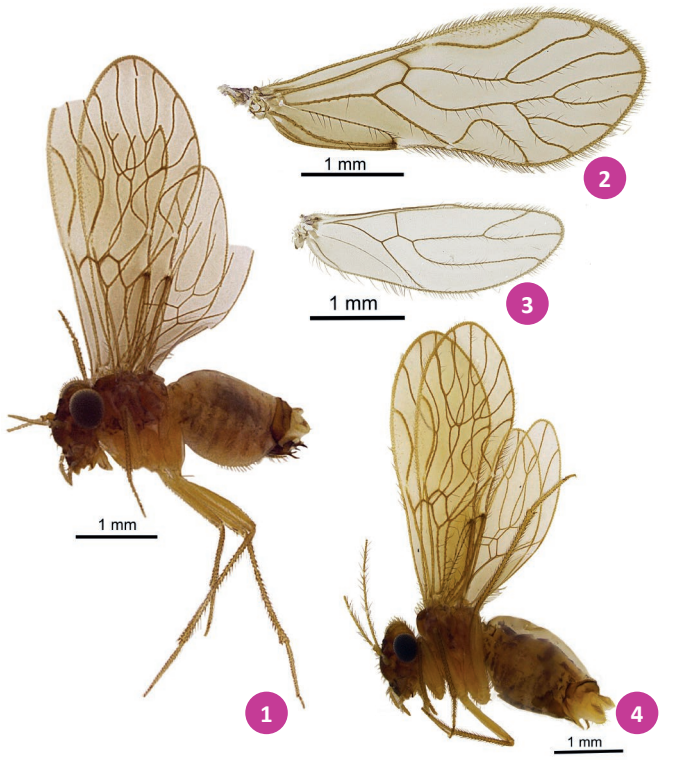
Ptiloneuridae Roesler, 1940

Triplocania Roesler, 1940

Triplocania furcata New, 1971 (Figs. 1-6)

Material examined: 1 male. Brazil, Roraima, Alto Alegre, Floresta Nacional de Roraima. 02°56'18.05"N 61°37'27.28"W. 15.I.2018. Malaise trap. 2 males. Brazil, Roraima, Caracaraí, Parque Nacional do Viruá, 01°19'22.3"N 61°09'29.5"W. Malaise Trap, 01-15.III.2017. 1 male. Brasil, Roraima, Caracaraí, Parque Nacional do Viruá, 01°19'22.3"N 61°09'29.5"W. Malaise trap. 01-15.I.2017. 3 males. Brazil, Roraima, Caracaraí, Parque Nacional Viruá. 01º27'16" N 61°59'03" W. 09-16.XII.2015. Malaise trap. J. A. Rafael; R. Boldrini; F. F. Xavier; & Iran C. Almeida. 1 male. Brazil, Roraima, Caroebe, Jatapu. 0°52'08"N 59°40'33"W. 11-12.I.2019. Pensilvania trap. Zeferino W.S. 2 females. Brazil, Roraima, Caracaraí, Parque Nacional do Viruá, 01°19'22.3"N 61°09'29.5"W. 01-15.III.2017. Malaise trap. 2 females. Brazil, Roraima, Caracaraí, Parque Nacional do Viruá, 01°19'22.3"N 61°09'29.5"W. trap 04. 01-15.I.2017. Malaise trap. 2 females. Brazil, Roraima, Caracaraí, Parque Nacional do Viruá, 01°19'22.3"N 61°09'29.5"W. 01-15.IV.2019. Pensilvânia trap. 1 male. Brazil, Amazonas, Amoio km 45, 3°05'56"S 59°59'09"W. 24.iv.1982. E. L. Oliveira. 2 males. Brazil, Pará, São geraldo do Araguaia, Serra das andorinhas ig. Santa Cruz - sitio do Domingos. 6°10'14"S 48°34'04"W. 22-26.I.2020. Plewco Fly. Ribeiro. I. M. 1male. Brazil, Pará, Conceição do Araguaia, Rio Araguaia. 8° 21'04"S 49°16'43"W. 19-31.I.1983. Light trap. R. Nonato. 1 male. Brazil, Pará, Tucuruí, 3°47'12"S 49°41'11"W. 20.VIII.1982. CDC Trap. L.

Vidal. 1 male. Brazil, Pará, Tucuruí, 3°44'04"S 49°40'08"W. 26.VII.1983. CDC Trap. J. Arias. 1 male. Brazil, Pará, Tucuruí, V. Rep. R. Parakaram. 3°44'04"S 49°40'08"W. 16-20.VII.1983, CDC trap 10m. 1 male. Brazil, Goiás [Tocantins], Araguacema, Rio Araguaia. 8°48'09"S 49°33'43"W. 25.XI.1982. CDC Trap. Eg. I. Arias. 1 male. Brazil, Goiás [Tocantins], Araguacema, Rio Araguaia. 8°48'09"S 49°33'43"W. 18.XII.1982. CDC Trap. Eg. I. Arias. 1 male. Brazil, Goiás [Tocantins], XAMBIDÁ [Xambioá], Rio Araguaia. 14°07'03"S 50°54'11"W. 08.XII.1982. CDC trap - I. Arias. 1 male. Brazil, Mato Grosso, Chapada dos Guimarães, Vale da Benção. 15°25'55"S 55°48'22"W. 21.I.2012. Light trap. Silva-Neto, A. M.



Figures 1-4. *Triplocania furcata* New, 1972. 1. Lateral view of male. 2. Left forewing of male. 3. Left hindwing of male. 4. Lateral view of female. Scale in mm.

Distribution: Literature records: Brazil (Mato Grosso) and Colombia (Amazonas) (Silva-Neto & García Aldrete 2020). New records: Brazil (Amazonas, Pará, Roraima and Tocantis) (Fig. 9)

Comments: With these new records, this species becomes the *Triplocania* species with the largest distribution area, including five Brazilian states and one Colombian state.

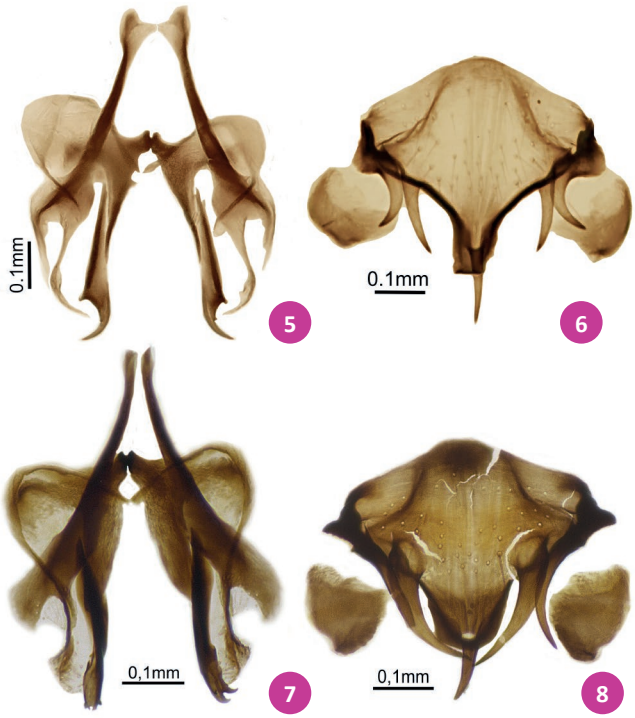
Triplocania furcatoides González-Obando, Carrejo-Gironza & García Aldrete, 2017

(Fig. 7-8)

Material examined: 3 males. Brazil, Roraima, Amajari, Maracá. 03°21'03.00"N 61°26'27.00"W. 01-15.II.2017. Malaise trap. 2 males. Brazil, Roraima, Amajari, Maracá, 03°21'59.00"N 61°26'04.00"W. 10-26.XII.2015. Malaise trap. Rede Bia, Boldrini, R., Rafael, J. A. 3 males. Brazil, Roraima, Amajari, Tepequém, 03°45'19.4"N 61°42'58.2"W. 01-15.VIII.2016. Malaise trap. 3 males. Brazil, Roraima, Caroebe, Jatapu. 0°52'08"N 59°40'33"W. 11-12.I.2019. Pensilvania trap. Zeferino W. S. 4 males. Brazil, Roraima, Caracaraí, Sitio da dona Rosinha, 1°41'39.3"N 60°38'50.8"W. 19.iii.2022. Pensilvânia trap. Oliveira I.

Distribution: Literature records: Colombia (Amazonas). New records: Brazil (Roraima) (Fig. 9).

Comments: The new record of this species for the Brazilian state of Roraima (especially in the municipality of Caroebe) extends to the east the distribution of this species in 1,364 km. Also, increases the diversity of *Triplocania* species from Brazil to 35 species and the number of *Triplocania* species that occurring in more than one country, to six species.



Figures 5-8. *Triplocania furcata* New, 1972. 5. Phallosome. 6. Hipandrium. *Triplocania furcatoides* González-Obando, Carrejo-Gironza & García Aldrete, 2017. 7. Phallosome. 8. Hipandrium. Scale in mm.

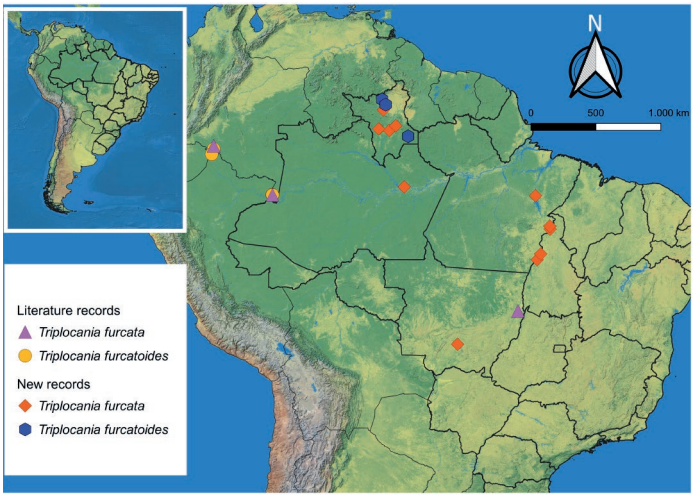


Figure 9. Distribution of the *Triplocania furcata* New, 1972 and *Triplocania furcatoides* González-Obando, Carrejo-Gironza & García Aldrete, 2017 with new records.

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Authors' Contributions

AFP, AMSN, MC & RB: Conceptualization, writing - review and editing; AFP, AMSN & MC: Methodology, Formal analysis, Writing - original draft, Visualization and Investigation; RB: Funding acquisition; AMS & RB: Supervision. All authors actively participated in the discussion of the results and reviewed and approved the final version of the paper.

Conflict of Interest Statement

Authors declare there are no conflicts of interest.

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