ENTOMOLOGICAL Communications

*Entomological Communications, 6, 2024: ec06032*
*doi: 10.37486/2675-1305.ec06032*
*e-ISSN: 2675-1305*
*Open Access Full Text Article*

## Scientific Note

# New host association between the cuckoo wasp *Caenochrysis striatidorsa* (Linsenmaier, 1984) and mason wasp *Pison plaumanni* Menke, 1968 (Hymenoptera: Aculeata)

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***Edited by: Daniel Aquino***

***Received: October 17, 2024. Accepted: November 26, 2024. Published: December 23, 2024.***

**Abstract.** This study reports a new association between *Caenochrysis striatidorsa* (Linsenmaier, 1984) (Hymenoptera, Shrysidinae) and *Pison plaumanni* Menke, 1968 (Hymenoptera: Crabronidae), aiming to expand the basic knowledge of these groups. Nests were collected between 2016 and 2017 in the states of Rio de Janeiro and Minas Gerais, and the distribution range of the species was also updated.

**Keywords**: Crabronidae, Chrysididae, Host-parasite interaction.

Commonly known as cuckoo wasps, members of the Chrysididae family are distinguished by their parasitic behavior and their strikingly metallic, ornamented integument, which makes them one of the most visually impressive groups of solitary wasps (Kimsey 2006).

Despite their visual appeal, individuals are collected only occasionally, usually with low representation in most Brazilian entomological collections (Lucena et al. 2024). All chrysidids are parasitoids of other insects, including larvae of solitary bees and wasps (Chrysidinae), phasmatodean eggs (Amiseginae and Loboscelidiinae), lepidopteran caterpillars (few Chrysidini), and prepupae of tenthredinoid sawflies (Cleptinae) (*e.g.*, Kimsey & Bohart 1991; Lucena & Almeida 2022).

In Brazil, 159 valid species of cuckoo wasps are presently recorded. *Caenochrysis* Kimsey & Bohart, 1981 (Hymenoptera, Chrysidinae), is the second most species-rich genus in the country, with 25 valid species (Lucena et al. 2024). Hosts of *Caenochrysis* include several Trypoxylini (*e.g.*, Krombein 1967; Kimsey & Bohart 1991), and some Pompilidae (Marinho & Vivallo 2020a; 2020b; Deus et al. 2023). This study reports for the first time the association of *Caenochrysis striatidorsa* (Linsenmaier, 1984) with *Pison plaumanni* Menke, 1968 (Hymenoptera: Crabronidae), emerging from abandoned nests of social wasps.

The nests of the social wasp *Mischocyttarus cassununga* (Von Ihering, 1903) were collected opportunistically from February 2016 to February 2017 in three areas: the Comendador Venâncio Hydroelectric Plant (21°11'09.7"S; 42°05'57.1"W) located in Comendador Venâncio, Rio de Janeiro state, the Botanical Garden of the Federal University of Juiz de Fora (21°44'16.2"S; 43°22'10.5"W), and the campus area of the Federal University of Juiz de Fora (21°46'23.9"S; 43°22'07.7"W) in Juiz de Fora/MG (Table 1).

The collected nests were kept in the laboratory for 30 days at room temperature (~28°C), 70% relative humidity, and monitored daily until emergence of the adult individuals from the cells. Voucher specimens are deposited in the Invertebrate Collection at the Instituto Nacional de Pesquisas da Amazônia, and Coleção Entomológica "Prof. J.M.F. Camargo", Universidade de São Paulo.

Although all nests were abandoned, they had been collected previously while still active as part of another study, which allowed for the identification of the social wasp species (Tab. 1). Eighteen individuals of *P. plaumanni* (Fig. 1b), emerged from three nests of the social wasp species *M. cassununga* (Vespidae: Polistinae). This supports the idea that abandoned social wasp nests provide excellent shelter and protection (Barbosa et al. 2021). Additionally, four specimens of *C. striatidorsa* (Fig. 1a) emerged from the same nests–three females and one male.

Species in the genus *Caenochrysis* are known to parasitize a wide range of hosts. However, the hosts for most species remain unknown, and no published studies have yet described their behavioral repertoire for invading host nests or determined whether they act as true larval parasitoids or as robbers of stored nesting resources (*i.e.*, kleptoparasites) (Kimsey & Bohart 1991). According to Lucena et al. (2024), there are published host records for only five species in Brazil (Tab. 2).

The new host, *Pison* Jurine, comprises 42 species recorded in the Neotropical region (Menke 1988; Menke & Fernández 1996). Previous studies have shown that species of this genus typically inhabit abandoned nests of other social wasps of the genera *Polybia* Lepeletier, *Mischocyttarus* de Saussure, and *Metapolybia* Ducke (Menke 1988; Richards 1978). The use of abandoned nests is due to the fact that the cell sizes are suitable for use as cavities (Fig. 1c). *Pison* is known for stocking cells with a variety of spiders (Bohart & Menke 1976).

Before this study, *C. striatidorsa* was only known from Santa Catarina (Linsenmaier 1984; Lucena et al. 2024). We herein expand its geographical distribution by including new records from Minas Gerais and Rio de Janeiro states. *Pison plaumanni* has been documented in Bahia, Piauí, Santa Catarina, and São Paulo, with an expansion into Minas Gerais and Rio de Janeiro (Rosa & Muniz 2024). As obligate parasitoid, *C. striatidorsa* may also co-occur throughout the southeastern and southern regions of the country, overlapping with the geographic range of their hosts.

Social wasp nests can serve as a resource for various other organisms, either as shelter, a food source, or even as a reproduction site, as is the case for parasitic and parasitoid insects (Barbosa et al. 2021; Detoni et al. 2023; Maciel et al. 2023). Although chrysidids are quite common in studies using trap-nesting techniques, most

published references lack species identification, listing only individuals at the family level. This constitutes a severe obstacle to a whole understanding of the true occurrence and diversity of hosts for these insects, as well as obtaining more detailed information on their biology.

**Table 1.** Species of collected nests, material, substrate, number of cells, and location. NC = Total number of cells in the nest; NM = Number of cells with nests and mud; NEI = Number of emerged individuals.

| Social Wasp Species | Substrate | NC | NM | NEI | Location |
|---|---|---|---|---|---|
| *Mischocyttarus cassununga* | Cement | 56 | 12 | 7 *Pison plaumanni* | Juiz de Fora/MG |
| *Mischocyttarus cassununga* | Wood | 107 | 47 | 3 *Caenochrysis striatidorsa*<br>6 *Pison plaumanni* | Comendador Venâncio/RJ |
| *Mischocyttarus cassununga* | Wood | 67 | 16 | 1 *Caenochrysis striatidorsa*<br>5 *Pison plaumanni* | Comendador Venâncio/RJ |

**Table 2.** Species of *Caenochrysis* recorded in Brazil with host associations and published references. Compiled from Lucena et al. (2024).

| Cuckoo wasp | Hosts | Reference |
|---|---|---|
| *Caenochrysis armata* (Mocsáry, 1889) | *Trypoxylon florale* Richards, 1934 (Crabronidae) | Perioto & Lara (2018) |
| | *Auplopus rufipes* (Banks, 1946) (Pompilidae) | Nether et al. (2019) |
| *Caenochrysis crotonis* (Ducke, 1907) | *Auplopus* cf. *rufipes* (Pompilidae) | Marinho & Vivallo (2020a; 2020b) |
| | *Auplopus subaurarius* Dreisbach, 1963 (Pompilidae) | Deus et al. (2023) |
| *Caenochrysis nigropolita* (Bischoff, 1910) | *Trypoxylon lactitarse* Saussure, 1867 (Crabronidae) | Rocha-Filho et al. (2019; 2020) |
| | *Trypoxylon nitidum* Smith, 1856 (Crabronidae) | Rocha-Filho et al. (2019; 2020) |
| | *Trypoxylon opacum* (Brèthes, 1913) (Crabronidae) | Nether et al. (2019) |
| *Caenochrysis parvula* (Fabricius, 1804) | *T. opacum* (Crabronidae) | Nether et al. (2019) |
| | *T. nitidum* (Crabronidae) | Rocha-Filho et al. (2020) |
| *Caenochrysis taschenbergi* (Mocsáry, 1889) | *Trypoxylon* sp. (Crabronidae) | Torretta (2015) |

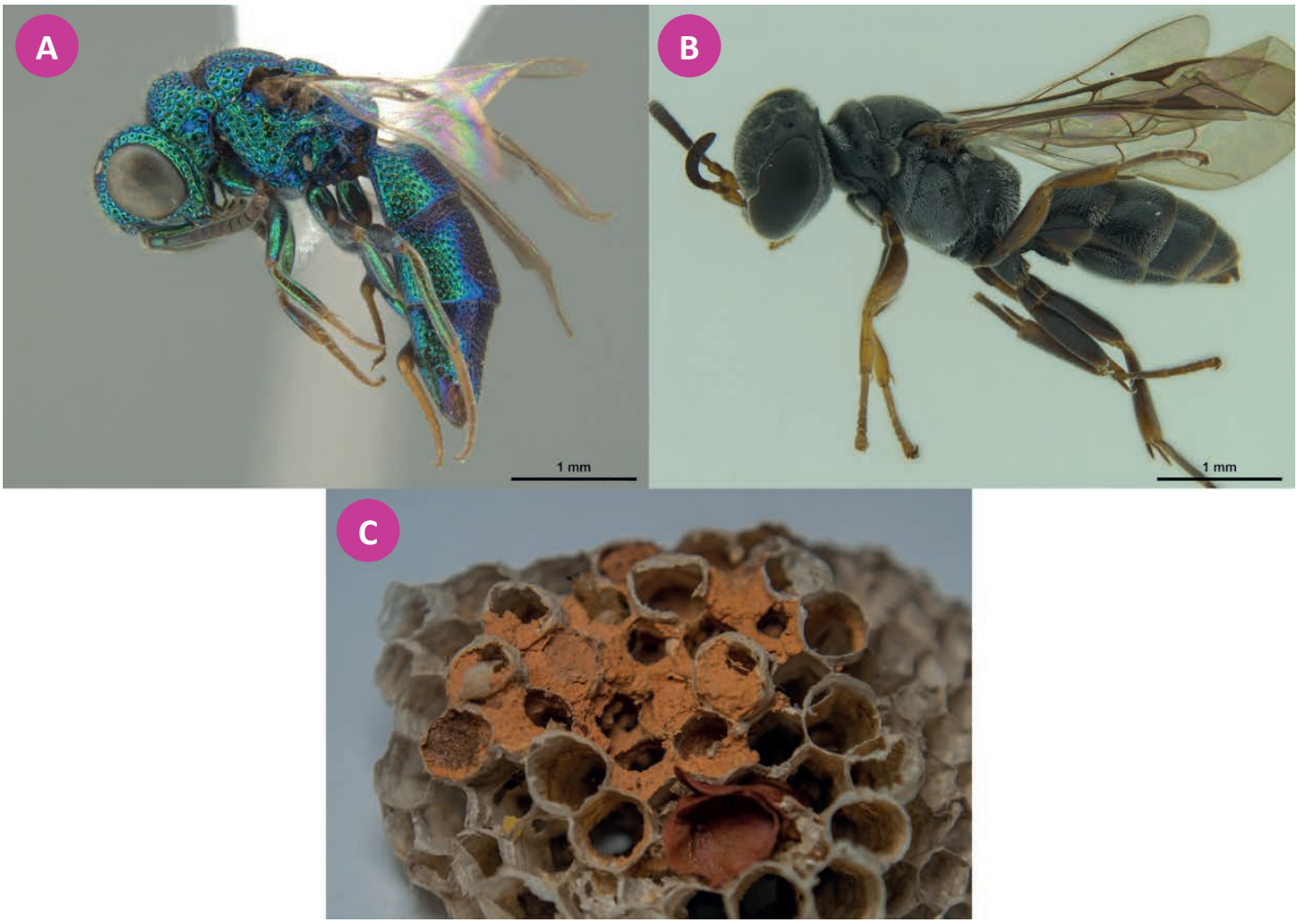


**Figure 1.** Lateral view of (a) *Caenochrysis striatidorsa* and (b) *Pison plaumanni*. (c) *Mischocyttarus cassununga* nest with the presence of mud cells.

## Acknowledgments

The authors would like to thank Dr. David Barros Muniz for confirming the species of Crabronidae.

## Funding Information

This work was supported by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), Conselho de Desenvolvimento Científico e Tecnológico (CNPq), Fundação de Amparo à Pesquisa do Estado do Amazonas (FAPEAM), and Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP #2022/00251-2).

## Authors' Contributions

PVAS, TTM, DAAL, BCB: Investigation, Validation, Writing - review & editing.

## Conflict of Interest of Statement

The authors declare that they have no conflicts of interest.

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