

Notes and Comments

## Nesting of the camouflaged nest of social wasp *Mischocyttarus mirificus* (Hymenoptera: Vespidae) in human buildings

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Social wasps build their nests by independent foundations (Polistini and Mischocyttarini) or swarms (Epiponini) (Jeanne, 1975), which may be on the abaxial surfaces of leaves, man-made substrates, plant branches, cavities in tree trunks or soil (Carpenter and Marques, 2001).

A small number of these insects nest in urban buildings to avoid damage caused by adverse weather conditions and natural enemies, while foraging for food at trade fairs, camping areas, picnic areas and urban gardens (Prezoto et al., 2019; Komonen et al., 2020). Additionally, the productivity and success of social wasp colonies depend on food, water, and nesting substrate resources (Castro et al., 2014; Brugger et al., 2019).

To protect their colonies, social wasps have evolved various adaptations (Detoni et al., 2021), including chemical defense mechanisms (Abd El-Wahed et al., 2021), aggressive behaviors (Western and Starr, 2019), associations with both invertebrates and vertebrates (Somavilla et al., 2013; Corbara et al., 2018; Servigne et al., 2020), camouflage strategies (Badejo et al., 2020; Milani et al., 2021), and specific nest architecture (Silveira, 2008).

*Mischocyttarus mirificus* (Zikán, 1935) (Hymenoptera: Vespidae) has been recorded in Southeastern Brazil in Itatiaia National Park (Rio de Janeiro state), in Environmental Protection Area São José (Minas Gerais state), Inconfidentes, and Bueno Brandão (Minas Gerais) (Souza et al., 2020; Milani et al., 2021). This wasp employs camouflage to conceal its nests through its slender shape and nest coloration, resembling dry branches and vines (Milani et al., 2021). This concealment-based strategy is observed in some *Mischocyttarus* spp. and it is related to the nesting location, morphology, layers of vegetation added to nest combs, and individual concealment, ultimately reducing predation (Silveira, 2008; Milani et al., 2020). These characteristics make studies of this species difficult. Furthermore, intolerance to disturbance and human action in anthropic areas makes the detection and study of this peculiar species even rarer.

Studying the architecture and nesting sites of social insects, such as *M. mirificus*, is crucial to understanding their behaviors, geographic distributions, and gender

identification keys (Wenzel, 1998; Souza et al., 2022). Therefore, the objective of this communication is to report the first case of *M. mirificus* nesting in an urban area.

*Mischocyttarus mirificus* nesting was observed in a residence in the urban area of the Conceição do Ibitipoca district, Ibitipoca, Minas Gerais, Brazil (21° 33' 53.1" S, 43° 54' 56.9" W), which is comprised of 1,004 inhabitants with housing near the environmental conservation park (Ibitipoca State Park). Morphometric data of the nests and the number of adult *M. mirificus* were determined.

The nest was attached to the wood of the roof of a residence and surrounded by branches of *Thunbergia mysorensis* (Wight), making visibility of the nest difficult, which could provide a form of defense against predators (Figure 1). An active colony of *M. mirificus* (n=7 individuals) in the post-emergence phase was found, with elongated cells having an oval shape (n=39), arranged vertically and sharing their dorsal wall, measuring 102 cm in length, and with cell openings of 0.5 cm. The nest was located at 124 cm above ground level.

*Mischocyttarus mirificus* builds vertical nests with a single elongated row of cells that resemble roots or twigs (Wenzel, 1998; Carpenter and Marques, 2001). This nest architecture can provide a cryptic character, reducing the action of predators (the major cause of mortality for these insects) (Cooper, 1998; London and Jeanne, 2000; Souza et al., 2022). The number of cells found (n=39) and the architectural pattern of the nest in *M. mirificus*, where new cells are added below the old ones, demonstrate the stability of the colony. Furthermore, they nest in forest environments that allow camouflage (plants similar to the shape and color of the nest), with no preference for plant species or substrate (Milani et al., 2021).

This marks the inaugural documentation of a synanthropic relationship of *M. mirificus*, capitalizing on camouflage in an urban setting to support longer colony lifespans and generations (Detoni et al., 2021). Social wasps play a vital ecological role, including pollination in urban and peri-urban ecosystems. Therefore, comprehending these interactions in the urban environment is crucial for conserving insect biodiversity as urban areas expand.

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Received: December 23, 2023 - Accepted: April 22, 2024



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**Figure 1.** Nest of *Mischocyttarus mirificus* (Hymenoptera: Vespidae) under *Thunbergia mysorensis* (Acanthaceae) leaf.

### Acknowledgements

The authors acknowledge the Brazilian agencies “Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES/PELD- FinanceCode 001), Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG)” for scholarships and financial support. “Thank you to Professor Dr. Juliane Floriano Lopes Santos (Universidade Federal de Juiz de Fora) for the information and images provided for the study.”

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