



## NEST ARCHITECTURE OF *Epicharis (Epicharis) flava* Friese, 1900 (Apinae): EVIDENCE OF A COMMON PATTERN IN SOLITARY BEES

TORRES-E-RIBEIRO, Beatriz<sup>1</sup>; GAGLIANONE, Maria Cristina<sup>1</sup>

<sup>1</sup>Research Group of Bee Ecology and Pollination, Laboratório de Ciências Ambientais, Programa de Pós-Graduação em Ecologia e Recursos Naturais, Universidade Estadual do Norte Fluminense Darcy Ribeiro, Campos dos Goytacazes, RJ, Brazil. [beatorreseribeiro@gmail.com](mailto:beatorreseribeiro@gmail.com)

Soil is the main nesting substrate for solitary bees, where they dig tunnels leading to brood cells, in arrangements that can vary between species. In this study, we investigated the architecture of *Epicharis flava* nests built in a sandy ravine (836 g/dm<sup>3</sup> sand), forming an aggregation covering 500 m<sup>2</sup>. The aggregation is in a peri-urban area of Semideciduous Seasonal Forest, in Campos dos Goytacazes, RJ, southeastern Brazil. Through excavations, we identified three types of architecture: nests with a single tunnel (n = 14), with a main tunnel and a lateral branch (n = 2), and with two entrances converging in a single tunnel (n = 2). The mean entrance diameter was 1.37 ± 0.15 cm (n = 100), and the mean tunnel length was 19.55 ± 13.82 cm (n = 18). A total of 113 brood cells were analyzed: 100 individual cells, five linear sequences of two, and one linear sequence of three cells. Although the soil was sandy, its compactness limited the excavation of additional nests. The high number of cells collected was possible due to natural soil collapse in parts of the aggregation. Among the individual cells, only 24 were intact; the others were open, containing soil or dead immatures and adults. The cells are cylindrical with a rounded base, internally coated with floral oil, and closed by an operculum with a concave inner surface, spiral texture, and central micropyle. Individual cells averaged 2.73 ± 0.21 cm in length, with minimum and maximum diameters of 1.44 ± 0.12 cm and 1.75 ± 0.10 cm, respectively, and an average volume of 6.70 ± 1 cm<sup>3</sup>. Structures with linear sequences of two cells measured 7.03 ± 0.7 cm and three cells, 10.14 cm, including intercellular spaces. Of the 24 closed cells, it was possible to monitor emergence and identify the sex of immatures in 15 cells (♀ = 6; ♂ = 9), with cells intended for females larger in maximum diameter ( $t_{13} = 2.93$ ;  $p = 0.0117$ ) and volume ( $t_{13} = 3.115$ ;  $p = 0.0082$ ). We observed that *E. flava* females mainly build simple tunnels with a single cell, although there is structural variation between nests of the same aggregation. The brood cells had larger dimensions than previously recorded, and morphological differences between sexes suggest differential investment in offspring. Our results expand knowledge of the nest architecture of *E. flava* and are consistent with the pattern in other solitary bees.

**KEYWORDS:** Epicharitini; Ground-nesting bees; Nesting aggregation; Oil-collecting bees;

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