

An observation of the parasitoid *Melittobia australica* Girault (Hymenoptera: Eulophidae) and its host, the solitary wasp *Sceliphron asiaticum* (Linnaeus) (Hymenoptera: Sphecidae)

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SCIENTIFIC NOTE

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**AN OBSERVATION OF THE
PARASITOID *MELITTOBIA*
AUSTRALICA GIRAULT
(HYMENOPTERA: EULOPHIDAE) AND
ITS HOST, THE SOLITARY WASP
SCELIPHRON ASIATICUM
(LINNAEUS)
(HYMENOPTERA: SPHECIDAE)**

Hymenoptera encompass a vast array of biological life-styles, including two truly remarkable diversifications within the insects: the largest development of eusocial taxa among the animals and the greatest elaboration of parasitic behavior among the insects (Whitfield, 1998). The parasitic mode of life, although not exclusive to hymenopterans, is a distinctive and important behavior, that is present in a wide variety of relationships, including endoparasitism, ectoparasitism, hyperparasitism and others.

Wasps in the genus *Melittobia* (Eulophidae) are small (1.0–1.5 mm), gregariously developing idiobionts, which parasitize many species of solitary bees and wasps and their nest cohabitants (Matthews et al., 2009).

In the present paper, we report the parasitic relationship between the eulophid parasitoid *Melittobia australica* Girault, 1912 and its host, the solitary wasp *Sceliphron asiaticum* (Linnaeus, 1758) (Sphecidae) in Brazil. The parasitic relationship between *Melittobia* and *Sceliphron* hosts has already been documented in Cuba, Costa Rica and The Dominican Republic (Freeman and Parnell, 1973; Genaro, 1994, 1996; Dahms, 1984b; Hunt, 1993; Hanson and Gauld, 1995; González et al., 2004). Parasitism by *Melittobia* is considered a major cause of mortality for immature *Sceliphron* inside nests (Freeman and Parnell, 1973; Matthews et al., 2009).

There are six described species of *Sceliphron*, which occur in tropical and temperate regions (Amarante, 2002). Two species of *Sceliphron* have been recorded from Brazil: *S. asiaticum* (Linnaeus, 1758) and *S. fistularium* (Dahlbom, 1843).

Only *Sceliphron asiaticum* is known from the State of Piauí (Amarante, 2002). This solitary wasp builds mud nests using detritus and even feces. Spider body parts are primary food source for *Sceliphron* larvae and are sometimes used in nest construction (Bohart, 1976).

Presently, there are 12 described *Melittobia* species worldwide (Matthews et al., 2009; Noyes, 2013); two species are found in Brazil: *M. australica* Girault, 1912 and *M. hawaiiensis* Perkins, 1907 (Dahms, 1984a; Mathews et al., 2009). These are common enemies of many solitary wasps, such as species of *Trypoxylon* and *Sceliphron* (Sphecidae) and *Bombus* (Apidae). In addition, host records for *Melittobia* species include various species of Coleoptera, Diptera, Dictyoptera and Lepidoptera (Matthews et al., 2009). *Melittobia* has shown to have devastating effects on pollinator populations due to a large multiplier effect. *Melittobia* can produce several hundred progeny per host and has multiple successive generations per year (Matthews et al., 2009).

A nest of *S. asiaticum* (Fig. 1) was collected in May 2011 inside a house in the municipality of Floriano, Piauí, in northeastern Brazil (06°47'02"S, 43°02'25"W) and taken to the entomology laboratory at EMBRAPA Meio-Norte, at Teresina, Piauí. The nest was kept in a sealed plastic container so that any emerging parasitoids could be observed. After the parasitoids emerged, we examined the inside of the nest, looking for spiders and *Sceliphron* pupae. The sphecid pupae were extracted and the parasitoid contents were dried and either card or slide mounted. Any spider parts were identified and then discarded. The parasitoid wasps were identified using keys by Dahms (1984a) and LaSalle (1993). The solitary wasp was identified by Dr. Márcio Luiz de Oliveira at the Instituto Nacional de Pesquisas da Amazônia. The spiders were identified by the first author (LSC). One specimen of *Sceliphron* found inside the nest was mounted as a voucher. All vouchers were deposited in the Hymenoptera collection at the Coleção de História Natural da Universidade Federal do Piauí (CHNUFPI; Curator L. S. Carvalho) in Floriano, Piauí, Brazil.

The presence of *S. asiaticum* nest near man-made structures has been reported previously for

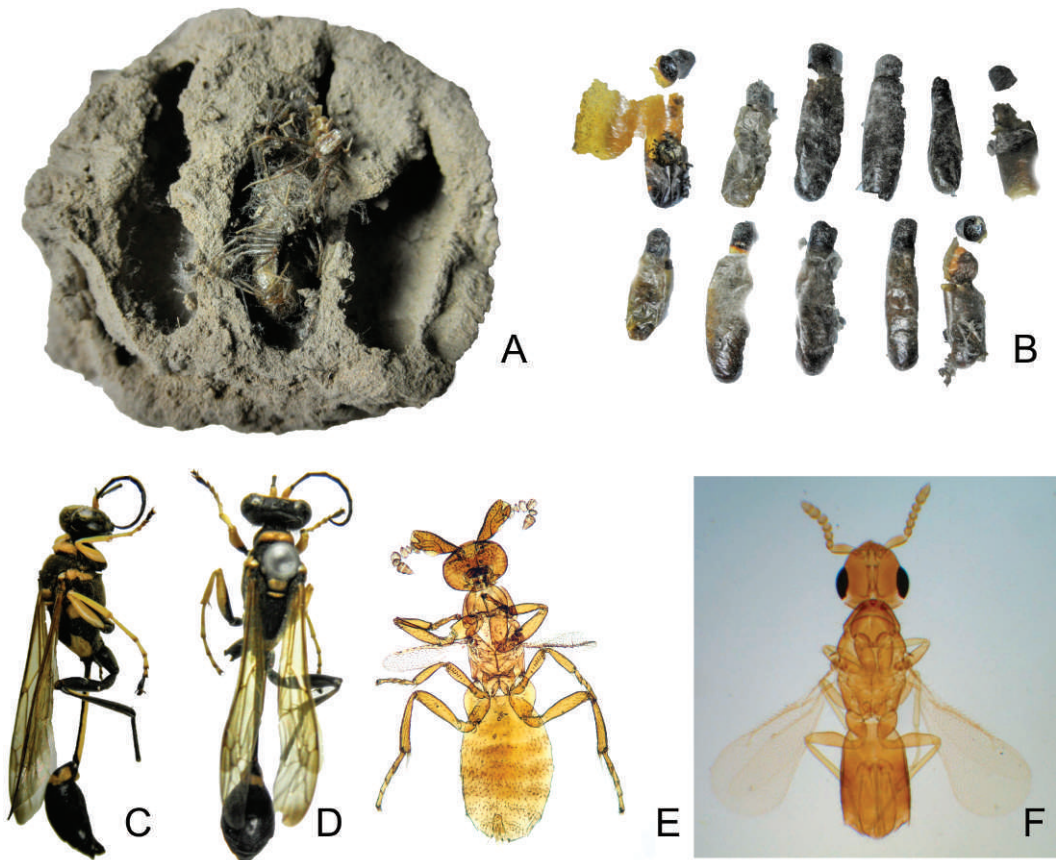


Fig. 1. A nest of *Sceliphron asiaticum* found inside a house in the municipality of Floriano, Piauí, northeastern Brazil and the habitus of adult *Sceliphron asiaticum* and *Melittobia australica*. A. Nest. B. Pupae. C. Lateral and D. dorsal view of an adult *S. asiaticum*. E. Male and F. Female dorsal view of adult *M. australica*.

other *Sceliphron* species, such as *S. assimile* (Dahlbom, 1843), *S. caementarium*, *S. fistularium* (Dahlbom, 1843) and *S. laetum* (F. Smith, 1856) worldwide (Freeman and Parnell, 1973; Early and Townsend, 1992; Harris, 1992; Hunt, 1993; Buys, 2009). The nest studied here was constructed mainly of sand soil (mud) and had 12 chambers, each with a single pupa of *Sceliphron asiaticum* (Fig. 1A). We observed a single egg in each chamber in the *S. asiaticum* nest. This is similar to other congeneric species of *Sceliphron* (e.g., *S. assimile* and *S. laetum*) (Hunt, 1993; Elgar and Jebb, 1999). Spider body parts (Fig. 1B) were found near the pupae. (CHNUFPI 0009; Fig. 1C, D). Over 100 winged parasitoids emerged from the sphecid pupae sampled. They were identified as *M. australica* (CHNUFPI 0010; Fig. 1E, F). No

wingless parasitoid emerged. The parasitism rate was 100%.

The spider parts in the *S. asiaticum* nest were identified as belonging to one of five families: Salticidae, Oxyopidae, Anyphaenidae, Corinnidae (Castianeirinae) and Thomisidae. All individuals are cursorial spiders (Dias et al., 2010) and no orb-web spiders were found. *Sceliphron* prey on a variety of spider taxa, including only orb-weavers by *S. laetum*, *S. fistularium* (Harris, 1992; Elgar and Jebb, 1999; Camillo, 2002; Buys, 2009), and *S. caementarium* (Eberhard, 1970; Blackledge and Pickett, 2000). Thus, the finding of only cursorial spiders in the nest of *S. asiaticum* is an unexpected result. This present paper provides another conformational record of the parasitism of the solitary wasp *S. asiaticum* by the parasitoid *M.*

australiana, and verifies cursorial spiders as the wasp's unexpected preys.—Leonardo S. Carvalho, Universidade Federal do Piauí, Campus Amílcar Ferreira Sobral – CAFS, BR 343, Km 3.5, Bairro Meladão, 64800-000, Floriano-PI. E-mail: carvalho@ufpi.edu.br; Programa de Pós-Graduação em Zoologia, Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brazil; Marcus Vinicius O. Bevilacqua, Programa de Pós-Graduação em Entomologia, Instituto Nacional de Pesquisas da Amazônia – INPA, Avenida André Araújo, 2936, Aleixo, 69060-001, Manaus-AM, Brasil. E-mail: marcusbevilacqua@gmail.com; Ranyse B. Querino, Embrapa Meio-Norte, Avenida Duque de Caxias, 5650, 64006-220, Teresina-PI, Brasil. E-mail: ranyse.silva@embrapa.br.

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