Revista Ceres 32(180):170-174. 1985.

THE FIRST DEFINITIVE HOST RECORD FOR *Leucospis cayennensis* WESTWOOD (Hymenoptera:Leucospidae) [1]

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1. INTRODUCTION

A study was initiated in 1984 on the nest ecology of the mud-dauber wasp, *Sceliphron asiaticum* (L.) (Hymenoptera:Sphecidae), at several localities in the States of Minas Gerais and Rio de Janeiro, Brazil (*1, 7*), as a parallel investigation to that of *S. caementarium* (Drury) undertaken in Tippecanoe and Warren Counties, State of Indiana, U.S.A. (*5*). These two species, plus *S. assimile* (Dahlbom), form a closely related group that have a natural, chain-like, continental distribution from southern Canada to Argentina and Chile (*2, 8, 9*).

The primary objectives of these studies have been to determine in-nest survivorship and identify mortality factors of the wasps, as well as the ecological importance of the old nests as sites for the development of a post-occupant fauna. It is reasoned that if these nests can be considered as a series of simple systems (*10*), then it might be possible to understand insect population phenomena having a wider implication and application (*6*).

The purpose of this paper is to record a new host-parasitoid association and to illustrate some of the pitfalls that are possible in such studies.

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[1] Received for publication 13-3-1985.

Contribution from Project NR 255/DBA «The biosystematics of solitary wasps and bees (Insecta:Hymenoptera)».

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2. METHODS AND MATERIALS

The nest of *S. asiaticum* reported here was one of several collected on July 5, from buildings on the Technical Campus (CEDAF) of the Federal University of Viçosa at Florestal, Minas Gerais. The methodology of collection and study is extremely simple as described by DELLA LUCIA and CHANDLER (*5*).

The nests were removed from their substrates (walls, support beams, braces, etc.) by use of a broad-blade putty knife, with the blade edge sharpened. Unlike the nests of *S. caementarium* that are not covered with and additional mud layer and, therefore, are not so firmly attached to the substrate, those of *S. asiaticum* are strongly anchored by a heavy mud layer that covers the nests and reinforces the substrate. This requires that they be removed with some force and yet remain intact for study. The nests of *S. asiaticum* were of unknown ages.

Each nest was placed in a small paper sack with identifying notes. In the laboratory, these nests were dissected and the cell contents and features recorded. As appropriate, some materials were preserved and others were reared in paper cups covered with cheesecloth. All materials are to be deposited in the Entomological Research Collection, Department of Animal Biology, Federal University of Viçosa, Minas Gerais.

3. RESULTS AND DISCUSSION

The nest of *S. asiaticum* consisted of nine cells. Of these, *S. asiaticum* adults had emerged from six, and three cells contained live adults of the *Sceliphron* parasitoid, *Melittobia acasta* (Walker) (Hymenoptera:Eulophidae). Of the six cells from which *S. asiaticum* adults had emerged, two remained open and unoccupied.

The other four cells had been utilized by a post-occupant bee, *Centris tarsata* Smith (Hymenoptera:Anthophoridae) (det. Padre J. Moure), but this was not so clearly obvious in first observations. One of the original *Sceliphron* cells had apparently been divided into two *Centris* brood cells because it contained two adult male bees ready to emerge. In addition, this cell had a distinct mud turret beyond the entrance plug as constructed by the *Centris* female. Each of the three remaining cells, utilized by *Centris* without modifications except for the mud closures, contained a mature larva. Two of these larvae were successfully reared to the adult stage (1 male, 1 female) and were determined to be *Leucospis cayennensis* Westwood (Hymenoptera:Leucospidae) (det. L. Chandler).

C. tarsata has been reported from at least Guatemala to Argentina although the early records from Mexico and Central America require confirmation. Nothing is known of its nesting biology, but other small species of *Centris* nest in preexisting cavities as burrows in old logs and in trap nests (*Michener, pers. comm.*). This reported nest in one of a mud-dauber, and observations made at Altamira, Pará where *C. tarsata* females were investigating grooves in stacks of finished lumber would indicate that *C. tarsata* has similar habits.

L. cayennensis has an equally wide range having been recorded from Mexico to southern Brazil (*3, 11*). This record of *L. cayennensis* from *C. tarsata* is the first definitive host record for the parasitoid, and the first record of a species of *Centris* as a host for a species of *Leucospis* (*3*). Not withstanding the concident geographical distributions of the two species, there is no reason to assume that *L. cayennensis* is host specific (*Michener, pers. comm.*). Little is known about the biology of *L. cayennensis*; BOUCEK (*3*) wrote: «Hosts not known for certain, but one specimen was reared from a mud cell, 'possibly a bee', in Guayana».

These observations were made under extremely fortunate conditions. Had the

host bee not been present and its post-occupant cells identified; or, under circumstances of less careful dissection of the nest, it is almost a certainty that *S. asiaticum* would have been recorded as the host. This error would have resulted because: the nest was that of *S. asiaticum;* the post-occupancy by *C. tarsata* was not so easily detectable since the *Sceliphron* cells were not much altered; the presence of live adults of *M. acasta* in other cells, a definite parasitoid of *S. asiaticum*, would indicate a recent *Sceliphron* occupancy (i.e., that insufficient time had lapsed for extensive post-occupant activity); and, there is a literature record (*4*) of *Sceliphron* as a host of *Leucospis*, but this record was not listed BOUCEK (*3*).

Many species of vespid and sphecid wasps construct simple to elaborate nests of mud. Because these nests are usually constructed in sheltered areas, they may persist intact for many years; and, although these nests may be built upon by females of successive generations and reach an impressive size or group, old cells are not reused by their builders. These old nests or old cells are, however, of great importance to other species of wasps and bees that utilize pre-existing cavities in which to nest. These latter species tend to use and reuse these nests for as long as they remain habitable.

Simultaneous or successional mixed species occupancy of such nests is commonplace and typical; thus, some caution is required to determine in-nest relationships. These relationships must be based on the occupants and not on the nest. It would appear that some of the recorded host-parasitoid relationships are, or could be, in error in that the host was «assumed» and not definitive. The *Centris tarsata — Leucospis cayennensis* host-parasitoid association in a nest of *Sceliphron asiaticum* is an illustration of how this could occur.

4. SUMMARY

A mud nest of the sphecid wasp, *Sceliphron asiaticum*, collected at Florestal, Minas Gerais, had been post-occupied by the anthophorid bee, *Centris tarsata*, a fact that became known only with nest dissection. The parasitoid, *Leucospis cayennensis*, was reared from the cells of *Centris*. The presence of adult bees for host determination, the identification of the bee cells, and the rearing of the parasitoid was a fortunate series of circumstances that made this association possible. Under any other conditions, the host would undoubtedly have been considered to be *S. asiaticum*.

This is the first definitive host record for *L. cayennensis* and the first record of a species of *Centris* asa leucospid host.

The example is used to suggest that there are, or could be, erroneous host-parasitoid relationships that have a similar basis.

5. RESUMO

(PRIMEIRO REGISTRO DE HOSPEDEIRO DEFINITIVO DE *Leucospis cayennensis* WESTWOOD (Hymenoptera: Leucospidae)
cayennensis WESTWOOD (Hymenoptera: Leucospidae))

Ninhos de barro da vespa *Sceliphron asiaticum*, coletados em Florestal, Minas Gerais, foram pós-ocupados por abelhas antoforídeas, *Centris tarsata*, fato observado somente com o exame desses ninhos. O parasitóide *Leucospis cayennensis* foi criado das células de *Centris*.

A presença de abelhas adultas, a identificação de suas células e a criação do parasitóide, dentro de uma série de circunstâncias oportunas, permitiram a determinação dessa associação. Em qualquer outra condição, o hospedeiro de *L. cayennensis* provavelmente teria sido considerado *S. asiaticum*.

Esse é o primeiro hospedeiro definitivo de *L. cayennensis* e o primeiro registro de uma espécie de *Centris* como hospedeiro de *Leucospis*.

Esse exemplo pode ser usado para mostrar que há, ou poderá haver, relações errôneas hospedeiro-parasita, com bases semelhantes.

6. ACKNOWLEDGEMENTS

The authors wish to express their gratitude to the following persons who made invaluable contributions to the development of this paper: Pe. Jesus S. Moure, Federal University of Parana, Curitiba, Parana for the determination of *Centris tarsata* Smith; Dr. Eric Grissell, Systematic Entomology Laboratory, Washington, D.C. for providing literature and comments concerning *Leucospis cayennensis* Westwood and for his criticism of this manuscript; and, Dr. C.D. Michener, University of Kansas, Lawrence, Kansas for information about *Centris*.

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