SCIENTIFIC NOTE

Fig Wasps (Hymenoptera: Agaonidae) Associated to *Ficus mexiae* Standl (Moraceae) in Lavras, Minas Gerais, Brazil

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Neotropical Entomology 31(4):653-655 (2002)

Vespas do Figo (Hymenoptera: Agaonidae) Associadas a *Ficus mexiae* Standl em Lavras, Minas Gerais

RESUMO - A escassez de trabalhos a respeito da fauna de vespas do figo no Brasil motivou o presente estudo, que teve como objetivo apresentar os gêneros de Agaonidae (Hymenoptera) associados a sicônios de *Ficus mexiae* Standl. O estudo foi conduzido em um espécime nativo de *F. mexiae*, situado no câmpus da Universidade Federal de Lavras, Lavras, Minas Gerais. Foram encontrados quatro gêneros de Agaonidae, pertencentes a três subfamílias, ocorrendo no interior dos sicônios. As vespas dos gêneros *Aepocerus*, *Heterandrium* e *Idarnes* não são polinizadoras e as outras duas espécies, pertencentes ao gênero *Pegoscapus* Cameron, são vespas polinizadoras. As espécies polinizadoras foram encontradas co-ocorrendo em vários sicônios da mesma figueira.

PALAVRAS-CHAVE: *Aepocerus*, *Heterandrium*, *Idarnes*, *Pegoscapus*, co-ocorrência

ABSTRACT - The paucity of information on the fauna of the fig wasp in Brazil motivated the present research work, which intended to report the genera of Agaonidae that occur associated to syconia of *Ficus mexiae* Standl in this country. The study was conducted on one individual *F. mexiae* plant, located at the campus of the Federal University of Lavras, Lavras County, State of Minas Gerais, Brazil. Four different genera of Agaonidae, from three different subfamilies were found occurring inside the syconia. Three species from the genera *Aepocerus*, *Heterandrium* and *Idarnes* were non-pollinator wasps, while the other two were pollinating wasps of the genus *Pegoscapus*. The pollinator species were found co-occurring in many syconia of the same fig tree

KEY WORDS: *Aepocerus*, *Heterandrium*, *Idarnes*, *Pegoscapus*, co-occurrence

There are approximately 750 well known species in the genus *Ficus* L. (Moraceae) around the world, being each species intimately associated to a type of pollinator wasp from the hymenopteran family Agaonidae (Wiebes 1979, Boucek 1988). Although species of the families Pteromalidae, Torymidae and Eurytomidae (Hymenoptera: Chalcidoidea) had also been found associated to syconia of *Ficus*, the Agaonidae are the most specialized for the pollination of this plant genus (Boucek 1993).

The fig fruit, or syconium, is an urn shaped receptacle that contains hundreds to thousands of flowers. When the female flowers reach maturity and the stigmas become attractive, the female wasps, loaded of pollen and attracted by volatile substances, crawl through the ostiolar bracts and enter the fig cavity (Ware *et al*. 1993). These foundresses lay eggs through styli of a certain proportion of the female flowers, pollinate some other ones and then die (Gibernau *et al*. 1996). The male flowers mature in synchrony with the emergence of the offspring; the female wasps copulate with the partners and then leave the syconium in search of another attractive fig fruit, this way disseminating pollen among the fig population (Herre 1989).

The maintenance of the high specificity between fig species and Agaoninae pollinator has been assured as an extreme example of co-evolution (Janzen 1979). However, the mechanism that determines this specificity is not clearly understood (Ware *et al.* 1993). Although the vast majority of the well-known interactions involve a fig with a specific fig wasp, some exceptions have been recorded (Wiebes 1979). For example, two species of Agaoninae wasps, *Ceratosolen arabian* Mayr and *Ceratosolen galili* Wiebes, co-occur in *Ficus sycomorus* L. and in *Ficus mucuso* Ficalho in Africa (Wiebes 1964).

Wasps of the fig trees that occur in the Americas are not well known (Wiebes 1995). This work intended to contribute reporting the genera of Agaonidae that occur associated to syconia of *Ficus mexiae* Standl in Lavras County, State of Minas Gerais, Central Brazil.

The study was performed on one individual native *F. mexiae plant*, located at the campus of the Universidade Federal de Lavras (Federal University of Lavras), Lavras County, State of Minas Gerais, Central Brazil (21°13'43"S and 44°59'04"W).

Twenty-nine syconia at the female phase (moment in which the female flowers become attractive to the wasps, as described by Hanson & Ramirez 1995) were individually wrapped up in polyester nets (forming small bags) to retain the emerging wasps. Wrapping was done on May 14th 2001 and remained enough time to allow emergence of wasps (2 to 3 days). After wasps' emergence, syconia with the wrappings were taken to the laboratory. Emerging wasps were captured using an entomological aspirator and maintained in 10% formaldehyde solution. The wasps were then sorted and identified to genus level according to Boucek (1993). The wasp type-specimens were deposited in the G. Schiffler personal collection. Four genera, belonging to three different subfamilies were identified:

***Aepocerus* sp. Mayr (Subfamily Otitesellinae).** This genus possesses eight well-known species in southern Brazil (Boucek 1993). Pereira *et al.* (2000) reported it as occuring on *F. eximia* in Campinas and Londrina counties. It also occurs on *F. clusiifolia* in Guarapari County (Schiffler, unpublished). This report increases its distribution to Lavras County, State of Minas Gerais. Females introducing the ovipositor repeated times in distinct points of the surface on the outside of a *F. clusiifolia syconium* were observed. Possibly, choosing a place to introduce the eggs or introducing them in more than one place. Those observations were made *in vitro* after fruit harvesting (Schiffler, unpublished). The strategy of oviposition of *Aepocerus* sp. indicates that this species is a non-pollinator wasp. However, the knowledge about the impact of non-pollinator wasps on reduction the reproductive success of the pollinator wasps and fig trees is still fragmentary (Bronstein 1991, Kerdelhué & Rasplus 1996, West *et al.* 1996).

***Heterandrium* sp. Mayr (Subfamily Otitesellinae).** The type-material of the type series of most species of *Heterandrium* is from Blumenau County, State of Santa Catarina, Brazil (Boucek 1993). The species has also been reported on *F. eximia* Schott in areas of Campinas County, State of São Paulo and Londrina County, State of Paraná by Pereira *et al.* (2000) and on *F. clusiifolia* Summerh, in the coastal forest of Três Praias, Guarapari County, State of Espírito Santo (Schiffler, unpublished). In this work, specimens from this genus were found in some *F. mexiae* syconia, thus increasing its distribution to Lavras, Minas Gerais. According to Boucek (1993), species of this genus do not show high specificity to the host and prefer to oviposit in the largest syconia.

***Idarnes* sp. Walker (Subfamily Sycophaginae).** According to Bronstein (1991), there is indirect evidence that species of this genus are gall-formers, having an intimate dependence on pollinators, to prevent syconia from aborting, and later, to chewing an exit hole. The genus *Idarnes* has approximately 30 species in Costa Rica (Hanson & Ramirez 1995) and they present high specificity for fig species (Gordh 1975). Although species of this genus have never been formerly recorded in Brazil, it seems that it is relatively abundant, being found in Campinas, Londrina (Pereira *et al.* 2000), Guarapari (Schiffler, in press), and now in Lavras.

***Pegoscapus* sp. Cameron (Subfamily Agaoninae).** There are 52 species described in the Americas, from Florida to Argentina (Wiebes 1995). In this study two species, belonging to different subgenera, were captured, co-occurring in several syconia of *F. mexiae*. This co-occurrence shows that, as in examples of other species of *Ficus* in Africa, more than one pollinator species may exist for each species of *Ficus* (Wiebes 1964). However, knowledge about the biology of the group of species that is intimately related to pollinating species turns to speculation any explanation for the mechanisms that act in the population dynamics of co-occurring species. The high polymorphism of the few well-known species in the New World and the restricted number of studied fig trees (Wiebes 1995) indicate the need of larger investigations on the fig/fig wasp mutualism.

Acknowledgments

Thanks are extended to the Setor de Ecologia (Departamento de Biologia, Universidade Federal de Lavras) for the structural support, to Fernanda Carvalho for the support in the field, to Prof. Julio N. C. Louzada for the incentive and allowance in using the equipment of this sector, Prof. Eduardo Van den Berg for the identification of *Ficus* species and to Fernando Vaz-de-Mello for reviewing the manuscript.

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Received 20/11/01. Accepted 02/08/02.