INTERACTION BETWEEN SOCIAL WASPS (HYMENOPTERA: VESPIDAE: POLISTINAE) AND FRUITS OF *MYRCIARIA* SP. (MYRTACEAE)

André Rodrigues de Souza [1]

Daniele de Fátima Alves Venâncio [2]; Fábio Prezoto [3]

1 - Universidade Federal de Juiz de Fora, Instituto de Ciências Biológicas, Programa de Pós - Graduação em Comportamento e Biologia Animal, Campus Universitário-Martelos, 36.036 - 330 - Juiz de Fora, MG - andrebioufjf@gmail.com; 2 - Universidade Federal de Juiz de Fora, Instituto de Ciências Biológicas, Programa de Pós - Graduação em Ecologia, Campus Universitário-Martelos, 36.036 - 330 - Juiz de Fora, MG; 3 - Departamento de Zoologia, Instituto de Ciências Biológicas da UFJF, Campus Universitário-Martelos, 36.036 - 330 - Juiz de Fora-MG.

INTRODUCTION

Among some behaviors demonstrated by social wasps, foraging activity has highlighted importance, which involves the search for water, vegetal fibers, carbohydrates and proteins (Raveret - Richter 2000). During the search for these resources, those insects show various ecological and behavioral interactions. In Brazil, there are approximately 319 described species of social wasps (Carpenter & Marques 2001), and less than 20 of them have already been recorded with some information on their foraging behavior.

A well known interaction among social wasps is caterpillar predation (Gobbi *et al.*, 1985; Prezoto *et al.*, 1994; Giannotti *et al.*, 1995), which constitutes one of the main defoliating groups of herbivores (Carvalho & Souza 2002). The practicability of the use of social wasps on herbivorous insects control has been demonstrated for different cultures as the following: tobacco (Rabb & Lawson 1957), cotton (Shang - Chiu 1976), spring greens (Gould & Jeanne 1984), and corn (Prezoto & Machado 1999). They are also considered biological control agents of urban pests (Prezoto *et al.*, 2008), because they prey, besides other insects, on Diptera of the family Culicidae (Prezoto *et al.*, 2005).

Another relevant interaction occurs when social wasps visit flowers in the search for carbohydrates. In this case, these insects may contribute to pollen dispersion (Dutra & Machado 2001; Quirino & Machado 2001; Vitali - Veiga & Machado 2001).

Reports on neo - tropical social wasps visiting fruits in agrosystems are few in Brazil. Silva *et al.*, (1968) and Hickel & Schuck (1995) observed these insects foraging on ripe grape bunches in Minas Gerais and Santa Catarina, respectively. During interactions, wasps were able to break the fruit skin, what resulted in the destruction of the grape bunches.

This little known aspect of behavior represents relevant economic implications. In the effort of minimizing damages on productivity caused by these insects, it may become necessary to understand their fruit interactions.

Species of the genus *Myrciaria* are arboreal plants, from tropical humid subtropical climate (Manica 2000). The fruit consists of globose berry, whose epicarp varies from dark purple to black, and it has a soft pulp, white and succulent, with sub - acid flavor (Manica 2000; Pereira 2003). They are consumed in natura or processed as juices, jams, liqueurs, vinegars and medicine teas (Magalhães *et al.*, 1996; Donadio 2000; Pereira 2003). These plants are widely found in southeastern Brazil, mainly in the pluvial Atlantic forest and in the altitude sub - forests (Lorenzi 1992), though information on fruit visitors of these species are rare.

OBJECTIVES

The present work demonstrates social wasp behavior during interactions with fruits of *Myrciaria sp.* (Myrtaceae).

MATERIAL AND METHODS

Social wasp interactions with fruit of *Myrciaria* sp. were studied in the month of October of 2008, in a rural area in the municipality of Juiz de Fora, MG ($21^0$47'16.87"S, $43^0$38'17.63"W). Three plants were sampled, about three meters far from each other, in a pasture area, and surrounded by eucalyptus plantations and a fragment of secondary Atlantic forest. Behavioral observations occurred in a three - day period, always with an interval from 8 a.m. to 5 p.m.. Frequency of social wasps in plants was classified in: low (when observed up to 5 individuals); medium (6 - 20) and high (more than 20 individuals). Some visitor individuals were collected in order to laboratory identification.

RESULTS AND DISCUSSION

Nine species of social wasps interacting with fruits of *Myrciaria* sp. were observed being *Agelaia multipicta* (Halliday, 1836), *Agelaia vicina* (Saussure, 1854), *Brachygastra lecheguana* (Latreille, 1824), *Polybia occidentalis* (Olivier, 1791) and *Polistes simillimus* Zikán, 1951 in a low frequency; *Polybia ignobilis* (Halliday, 1836) and *Polybia jurinei* Saussure, 1854 in a medium frequency; *Polybia serycea* (Olivier, 1791) and *Synoeca cyanea* (Fabricius, 1775) in a high frequency. Most of them (89%, n= 8) were wasps of the tribe Epiponini. These tribe species include swarming - founding wasps, which have big colonies (with thousands of individuals) and whose individuals can forage for long distances.

During interaction, only ripe fruits still attached to the trunk of *Myrciaria* sp. were visited by wasps. Other insect species as Trigona spinipes (Fabricius, 1793) and Apis sp., dipterans and lepidopters were also present, visiting both ripe fruits in plants, and also those fallen on the ground.

During landing on fruits, wasps demonstrated two behavioral patterns: (1) they explored a pre - existing hole; (2) with its jaws, they opened a hole through which they explored inside the fruit. The first foraging pattern was performed by all species, whereas the second was observed only with Synoeca cyanea (Fabricius, 1775). Hickel & Schuck (1995) found six wasp species attacking grape bunches in Alto Vale do Rio do Peixe in Santa Catarina, and also observed S. cyanea breaking the fruit skin.

Due to this fruit interaction social wasps acquire pest status. In this context, it becomes necessary to develop solutions, according to damage level, aiming to minimize losses caused by such a behavior. Diversity reduction of vegetable species, which in turn is associated with natural area reduction, is partly responsible for the problem. Due to the shortage of foraging resources, these insects turn to fruits of cultivated plants as their food resource.

Attempting to minimize damage caused by wasps in vines, Hickel & Schuck (1995) suggest plantations of species in marginal areas, which could flourish abundantly and the enrichment of forests or reforesting of hills with abundant floral resources.

In the present study it was suggested a marginal fennel plantation (*Pimpinella anisum* L., Apiaceae), a plant which attracts various insects, among them, social wasps. This could contribute to diminish social wasps visiting fruits of Myrciaria sp.. Besides it, populations of these predators, as well as populations of non - target species as pollinizers would be kept.

CONCLUSION

Although the unpleasant behavior demonstrated by social wasps in this context, only in the harvesting periods they acquired pest status. It is necessary to highlight that these insects may help to combat herbivore attack all over the year. Preventing measures could keep damage in more tolerable levels. Thus, studies which make it possible an integrated management of social wasps have great importance for improving agricultural activities.

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