POLLEN COLLECTED BY APIS MELLIFERA (HYMENOPTERA: APIDAE) DURING THE SPRING IN DOURADOS-MS

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INTRODUCTION

Pollen is an essential food element for bees, as it is their main protein source. The flower use by visitors can include the collection of both pollen and nectar, which is some of the ways plants have to guarantee pollination. This insect-plant relation may go further to what can be expected and show tremendous details, specialy when trophic niches are studied. Every bee has its particular behavior, Apis mellifera is a generalistic collector that uses to search the flowering plants effectively, instead of using a few sources (Marques-Souza et al., 1993).

The africanized honey bee (A. mellifera) rapidly spread over the Neotropical habitats after it was introduced in 1839 by the priest Antônio Carneiro (Camargo, 1972); and since then has been competitive against native bees. Moreover, what concerns researchers is how damageful A. mellifera can be for native pollination systems and native bees. Abiotic features can influence the collection and data on the autoecology of the bee as the behavior in collecting, flight activity, distance from the source, abundance, preference and niche overlap are important to understand its trophic niche.

Regarding the importance of such relations and adding those like Apiculture, it becomes necessary to know what vegetal species are used as pollen resource by bees in a specific area. The aim of this survey was to identify the bee flora utilized by A. mellifera during spring months.

MATERIAL AND METHODS

The study was conducted at the campus of the Universidade Federal da Grande Dourados, situated 15 Km from the city of Dourados (54º 49' W and 22º 14' S), 452m above the sea level, in Mato Grosso do Sul. The area of the study has its natural vegetation of Mata Atlântica greatly modified as many introduced plant species and plantations are found there.

Pollen was daily collected from workers returning to the nest at about 9:00 am to 12:00 am during September to December and then samples were stored in glasses containing glacial acetic acid. After at least 24 hours, they were subjected to the method of acetolysis (Erdtman, 1960) and slides mounted. The grains found in these slides were identified by comparison with the reference pollen collection of the university and by consulting appropriate literature (Salgado-Labouriau, 1973).

RESULTS AND DISCUSSION

15 plants species, divided into 10 families represent the visited flora during the period from September 21 to December 21, 2005. The most frequent pollen types were Asteraceae (34%), Myrtaceae (21, 3%) and Euphorbiaceae (19, 15%). Graminea expressed 10,6%, Rubiaceae 4,3%, Mimosoideae 4,3% and 2,1% for Cruciferaceae, Portulacaceae, Trapaeolaceae and Malvaceae. Four pollen types of Asteraceae were seen, at least one per month, Helianthus annuus was one of them. The Eucalyptus spp. was the only Myrtaceae representant as well as Yatropha ssp. in the Euphorbiaceae family. Three types of Graminea and one of all other families were seen.

The most frequent pollen type identified was the Eucalyptus spp. (21, 27%), then Yatropha spp. with 19, 14%. Asteraceae type 2 (17%), H. annuus (10, 6%), Gramínea type 2 (6, 4%), Richardia brasiliensis (Rubiaceae), Mimosoideae and Asteraceae type 3 showed 4, 3% each. Asteraceae type 1, Graminea type 1 and 3, Raphanus raphanistrum (Cruciferaceae), Sida cordifolia (Malvaceae), Trapaeolum majus (Trapaeolaceae) and Talinum spp. (Portulacaceae) represent 2,1% each.

In September R. brasiliensis, R. raphanistrum and Asteraceae type 1 appear with 10% each, Eucalyptus spp. seemed to be a great source of pollen meaning 70% of all pollen harvested in the early spring (first week) and still occurs with 27% in October. That can be inferred by the extreme proximity of the colony

with a large number of Eucalyptus spp. trees. October is the most diversified month in terms of polinic types, Mimosoidae, Graminea type 1, S. cordifolia, T. majus, R. brasiliensis and Talinum spp. represent 9% each, Asteraceae type 2 comes with 18%. In November, Asteraceae type 3 and Graminea type 2 have 12,5% of significance among the collected pollen, Mimosoidae and H. annuus, only 6%. Still in November, Asteraceae type 2. and Yatropha ssp. were collected in abundance (37,5% and 25% respectively), but in December, 45, 5% of the pollen analysed is the Yatropha ssp. type and 36, 4% is the H. annuus type, being the only Asteraceae in this month, other two types of Graminea (types 2 and 3) were seen in this month with 9% each. In this period, a sunflower crop could be found in the campus and plants of Yatropha ssp. have been grown in the medicinal garden. Summing up, even if there was a preference or facility of a source, A. mellifera harvested always diversifying its sources of pollen, with never less than four per month.

Machado & Carvalho (2006) have found that almost 60% of bee visitors on sunflowers are A. mellifera and that it is an effective pollinator of this plant. More comparisons can be done to confirm the results of the present study; Carvalho et al. (1999) evidence the Africanized honey bee collecting Eucalyptus ssp., Sida ssp., some Graminea (Poaceae), Asteraceae and Mimosoidae polinic types. Asteraceae seems to be an important pollen source for A. mellifera, also shown by Manente-Balestieri (2002) that stated the facility for bees to collect pollen on Mimosa species, acting as effective pollinators, what was indeed seen during field observations in the present work. The use of Mimosoidae as pollen resource by many species of bees is explained by the long duration of its flowering period and the abundance of this resource on its flowers, a similar reason why the Myrtaceae and Asteraceae families were used.

During the spring months, though some plants were used much more than others, A. mellifera behaves collecting from many different sources, confirming what has been seen in the literature. Eucalyptus spp., Yatropha spp., Asteraceae polinic types, such as H. annuus and even Graminea were important sources for this bee. Nevertheless, more research on the subject is needed to really understand how the honey bee forages in the region.

BIBLIOGRAPHIC REFERENCES

CAMARGO, J. M. F. 1972. Manual de Apicultura. São Paulo, Ed. Agronômica Ceres, 252 p.

CARVALHO, C. A. L, MARCHINI, L. C., ROS, P., B.1999. Fontes de pólen utilizadas por Apis mellifera L. e algumas espécies de trigonini (Apidae) em Piracicaba (SP).Bragantia, Campinas, 58(1): 49-56.

ERDTMAN, G. 1960. The acetolysis method. A revided description. Sv. Bot. Tidskr, Upsala, v. 54, n. 4, p. 561-564.

MACHADO, C. S. & C. A. L., CARVALHO. 2006. Abelhas (Hymenoptera: Apoidea) visitantes dos capítulos de girassol no recôncavo baiano. Ciência Rural, Santa Maria, v.36, n.5, p.1404-1409.

MANENTE-BALESTIERI, F., C., L. 2002. Comportamento forrageador de abelhas sem ferrão (Hymenoptera: Meliponinae) e Apis mellifera (Hymenoptera:Apinae) na obtenção dos recursos florais, em Corumbá, Mato Grosso do Sul. Rio Claro, 190p. Tese (doutorado), Unesp.

MARQUES-SOUZA, A. C., ABSY, M. L., CONDÉ, P. A. A., COELHO, H. A. 1993. Dados da obtenção do pólen por operárias de Apis mellifera no município de Ji-Paraná (RO), Brasil. Acta Amazônica. 23(1): 59-76.

SALGADO-LABOURIAU, M. L. 1973. Contribuição à palinologia dos cerrados. Acad. Bras. de Ciênc., Rio de Janeiro, 291p.