FLIGHT ACTIVITY OF THE JATAÍ BEE (*TETRAGONISCA ANGUSTULA*) IN ANÁPOLIS, GOIÁS

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ABSTRACT

Meliponiculture is a form of stingless bee farming for honey production, pollination, and environmental maintenance. Meliponiculture presents itself as a viable alternative for sustainability and environmental protection, as pollination is essential for most flowers to produce fruit, which then serves as food. This study provides information on the flight behavior of *Tetragonisca angustula* bees in Anápolis between May and August 2024. The study was conducted at UniEvangelica, where a hive from the institution's existing meliponary was selected. Every day, with the aid of a Wi-Fi surveillance camera, information on the time and temperature at the beginning and end of the bees' flight activity was recorded.The results show that there is consistency in flight activity times; however, atypical temperature conditions can delay the start of jataí bee activities by up to four hours. This factor did not interfere with the end of daily flight activities.

Keywords: Stingless bee, Climate, Honey, Temperature.

INTRODUCTION

The growth of the world population combined with a greater demand for water and food puts enormous pressure on the sectors involved in food production. This has had a negative impact on some productive sectors, concentrating the use of resources in one field while generating shortages in another. As a result, the search for sustainable production practices has become a necessity (IWAMA, 1977).

Among the various opportunities to address scarcity, meliponiculture has stood out for its potential to be carried out in urban environments and to increase food production, as pollinated flowers produce fruits with higher yield (BRAGA et al., 2004).

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Ecologically, bee flight activities provide fundamental data for understanding the biology of species and applying it to species conservation and effective planning of agricultural plant pollination (IWAMA, 1977). However, there is little information on the foraging activity of bees, especially stingless bees, throughout the year.

The jataí bee (*Tetragonisca angustula*) measures approximately 5 mm, is golden in color, and occupies a variety of nesting sites, such as holes in walls, stones, and hollow tree trunks. It is considered one of the most adaptable species regarding nesting site selection, which positively influences its evolutionary success (PORTO, 2009). Given these characteristics, the objective of this study was to investigate the flight activity of *Tetragonisca angustula* bees throughout the year in Anápolis, GO.

METHODOLOGY

The project was conducted between May and August 2024, near the UniEVANGÉLICA Veterinary Clinic, located in the experimental area of the Anápolis unit (EXPERIMENTAL UNIT OF THE CERRADO – VER. ARTHUR WESLEY ARCHIBALD).

The selected site is located 50 meters from a forest reserve area belonging to the institution. It is situated at an altitude of 1,017 m with the following geographical coordinates: 16°29'344" S latitude and 48°93'994" W longitude. To avoid interference due to acclimatization or transport, the bee hive selected for this study had been installed at the site for over one year.

Every day, with the aid of a Wi-Fi surveillance camera with HD resolution (IM-8 Camera, Intelbras®) and image recording on a memory card, the flight activity of stingless bees *Tetragonisca angustula* (Jataí bee) was evaluated. The start and end times of these insects' activities throughout the day were recorded. A record was made when the first bee exited the hive, and another when the hive entrance was closed by the bees before nightfall.

Local ambient temperature data were collected using a digital thermometer (INCOTERM®) positioned next to the hive, allowing both bee activity and climate data to be simultaneously recorded. To achieve better image resolution, the thermometer and the hive were positioned 40 centimeters from the surveillance camera lens.

The data obtained were compiled in a spreadsheet and analyzed using descriptive statistics.

RESULTS

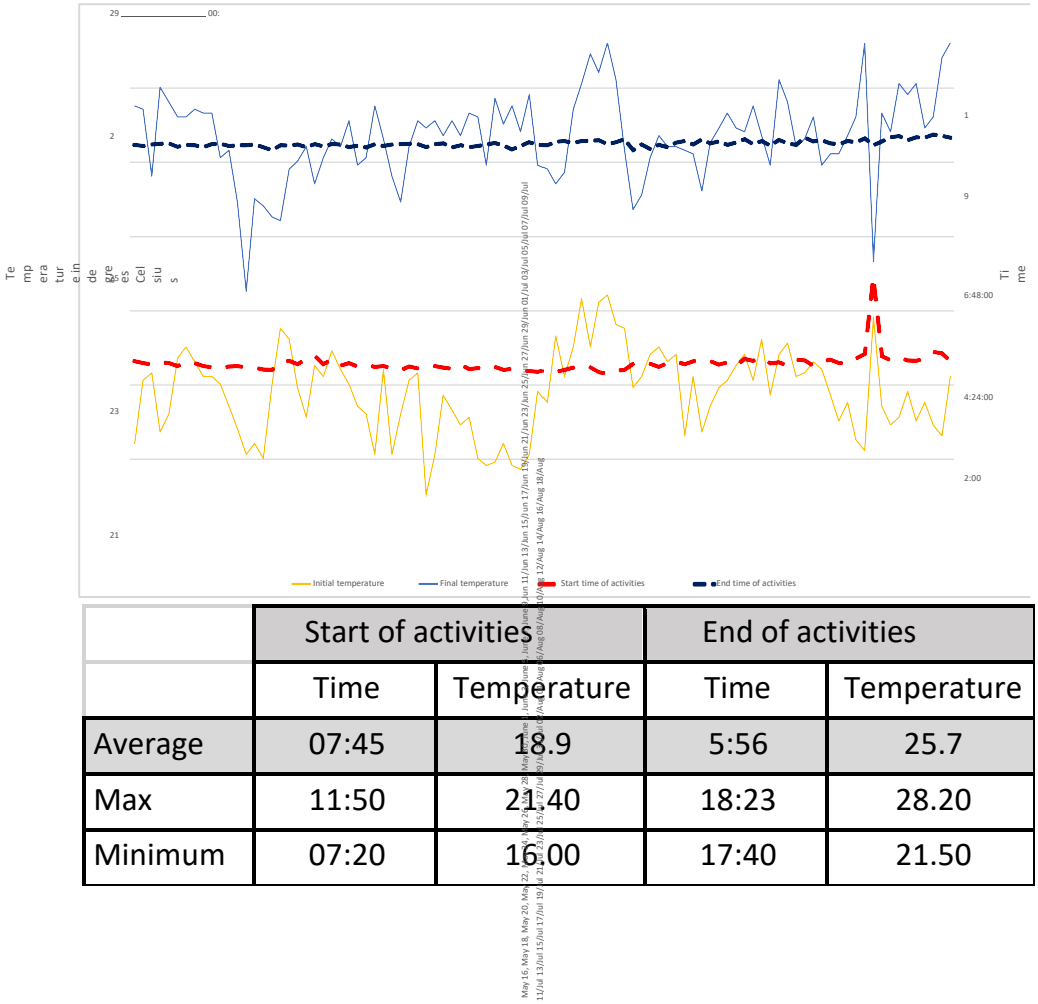
The behavior of Jataí bees was evaluated over a period of 94 days. During this period, it was observed that the bees' average start time was around 7:45 a.m., at an average temperature of 18.9°C, and their activities ended with the hive closing before nightfall, around 5:56 p.m., at an average temperature of 25.7°C.

Figure 1 shows that there is consistency in the times when the bees start and finish their activities, despite daily temperature variations. However, in cases of atypical ambient temperatures, such as those on August 10 and 26, when low temperatures at 7:30 a.m. (around 12°C) prevented flight activities from starting at the expected time. In these two cases, the bees only left the hive approximately four hours later than expected, at 11:50 a.m. and 11:48 a.m., when the ambient temperatures were 16°C and 21°C, respectively.

This type of behavioral change observed at the start time was not seen at the end of the bees' daily flight activities, even with temperatures ranging from 21.5°C to 28.2°C. The maximum variation in the end of flight activities ranged from 5:40 p.m. to 6:23 p.m., representing a deviation of -16 minutes to +27 minutes, respectively, compared to the average time.

Possibly, the main factor influencing the end of the Jataí bee's flight activities is light, as bees are unable to maintain oriented flight during the night.

Figure 1. Relationship between ambient temperature and the start and end times of flight activity of jataí bees in Anápolis, Goiás.



	Start of activities		End of activities	
	Time	Temperature	Time	Temperature
Average	07:45	18.9	5:56	25.7
Max	11:50	21.40	18:23	28.20
Minimum	07:20	16.00	17:40	21.50

CONCLUSION

In the city of Anápolis, Jataí bees exhibit consistent flight activity, with an average start time of approximately 7:45 a.m. However, a delay of up to four hours in this start time may occur on days when the ambient temperature is below the local average. It is noteworthy that, although ambient temperature influences the start time of activities, it does not appear to affect the end time, which remained consistent throughout the study. The end time of flight activities is likely influenced by light conditions.

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