

Characterization of spermathecal spermatozoa from *Melipona subnitida* (APIDAE, MELIPONINI)

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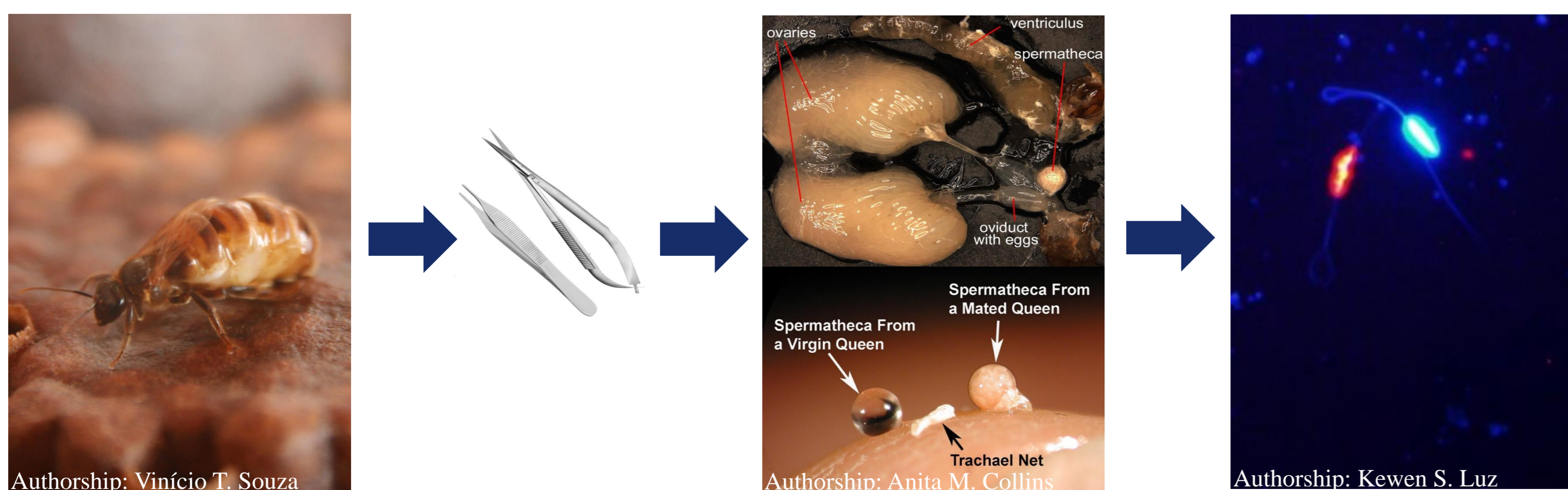
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1. INTRODUCTION

The Jandaira (*Melipona subnitida*) is a neotropical bee with significantly environmental and agricultural relevance for the Brazilian semiarid region, but reproductive biotechnologies that help the multiplication of this species have not been developed yet. We aimed to identify the basic characteristics of *M. subnitida* sperm stored in queens spermathecae.

2. MATERIAL AND METHODS

Twelve *M. subnitida* queen bees (fertile females) with one month old were collected from an urban meliponary of Mossoró city, Brazil. These females keep the sperm viable for long-term usage inside the spermatheca organ.



The animals were dissected for spermatheca collection. The collected material was gently homogenized in 20 µl of saline solution, then sperm indicators were analyzed such as viability, motility, concentration, and morphometry. The data obtained were analyzed through descriptive statistics using mean and standard deviation.

3. RESULTS AND DISCUSSION

An average of 80 ± 10.12 % of sperm viability was found (**table 1**), which indicates these females could storage the sperm cells for long-term usage and how they achieve this feat must be deeply investigated.

Table 1. The mean of spermathecal sperm parameters from *Melipona subnitida*

	Mean	Std deviation
Viability (%)	80	10.12
Motility (%)	54	16.11
Concentration (sptz per spermatheca)	1.7×10^6	8.0×10^5
Morphometry (total length in µm)	95.2	4.3

The mean values of motility found was 54 ± 16.11 %. The queen bees only use small amounts of semen to fertilize their eggs so there is no competition between sperm over egg fertilization and, consequently, high motility rates are not imperative for the reproductive success. An average of $1.7 \times 10^6 \pm 8.0 \times 10^5$ spermatozoa per spermatheca was found. It is noteworthy that all animals used in this study were newly fertilized queen bees, therefore they carried the entire sperm load of only one male. The measured spermatozoa had a total length of 95.2 ± 4.3 µm, it was possible to identify that the *M. subnitida* spermatozoa have shape, dimensions, and structures like other Hymenoptera, they were characterized as a filamentous cell that both head and tail have the same diameter and a structural difference cannot be distinguished.

4. CONCLUSION

The study of spermatozoa in queen bees spermatheca of *Melipona subnitida* is a potential tool for understanding the species reproductive biology also can be used as a basis for the development of reproductive biotechnologies for stingless bees.

Acknowledgements:

