

Interaction and behavior of virgin and physogastric queens in three Meliponini species (Hymenoptera, Apidae)

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ABSTRACT. We studied the behavior of virgin queens of the stingless bee species *Schwarziana quadripunctata*, *Paratrigona lineata* and *Tetragona clavipes*, investigating internal nest activities, including the cell provisioning and oviposition process. We made direct observation of queen behavior, with the aid of video filming. Forty-four virgin queens of *S. quadripunctata* were observed; one was larger and more attractive than the others. Miniature queens were more abundant than normal-size queens; both were found in prison chambers. Agonistic behavior between virgin and physogastric queens of *P. lineata* was observed during attempts at queen supersedure. After the disappearance of the physogastric queen and the appearance of a virgin queen in *T. clavipes* nests, the brood cells were sealed with pollen alone, but no egg. In all three species, the presence of one or more virgin queens appeared to make the colonies

nervous, even though constant production of virgin queens is vital to the survival of the colony and is part of the colony cycle in these bees.

Key words: Meliponinae; Colony homeostasis; Behavior; Virgin queens; Cell provisioning and oviposition process; Interactions