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Assessing hygienic behavior of *Apis mellifera unicolor* (Hymenoptera: Apidae), the endemic honey bee from Madagascar

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ABSTRACT. Hygienic behavior (HB) is one of the natural mechanisms of honey bee for limiting the spread of brood diseases and *Varroa destructor* parasitic mite. Objective of our study was to measure HB of *Apis mellifera unicolor* colonies (N = 403) from three geographic regions (one infested and two free of *V. destructor*) in Madagascar. The pin-killing method was used for evaluation of the HB. Responses were measured from 3 h 30 min to 7 h after perforation of the cells. Colonies were very effective in detecting perforated cells. In the first 4 h, on average, they detected at least 50% of the pin-killed brood. Six hours after cell perforation, colonies tested (N = 91) showed a wide range of uncapped (0 to 100%) and cleaned cells (0 to 82%). Global distribution of the rate of cleaned cells at 6 h was multimodal and hygienic responses could be split in three classes. Colonies from the three regions showed a significant difference in HB responses. Three hypotheses (geographic,

genetic traits, presence of *V. destructor*) are further discussed to explain variability of HB responses among the regions. Levels of HB efficiency of *A. mellifera unicolor* colonies are among the greatest levels reported for *A. mellifera* subspecies. Presence of highly hygienic colonies is a great opportunity for future breeding program in selection for HB.

Key words: Hygienic behavior; Pin-test; *Apis mellifera unicolor*; *Varroa destructor*

