

Comparative study of the hygienic behavior of Carniolan and Africanized honey bees directed towards grouped versus isolated dead brood cells

K.P. Gramacho¹ and L.S. Gonçalves²

¹Curso de Ciências Biológicas, Faculdade de Ciências e Tecnologia de Salvador, Salvador, BA, Brasil

²Departamento de Biologia, Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto, Universidade de São Paulo, Ribeirão Preto, SP, Brasil

Corresponding author: Kátia P. Gramacho

E-mail: gramacho.ssa@ftc.br; katholausa@hotmail.com

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ABSTRACT. In *Apis mellifera*, hygienic behavior involves recognition and removal of sick, damaged or dead brood from capped cells. We investigated whether bees react in the same way to grouped versus isolated damaged capped brood cells. Three colonies of wild-type Africanized honey bees and three colonies of Carniolan honey bees were used for this investigation. Capped worker brood cells aged 12 to 14 days old were perforated with the pin-killing method. After making holes in the brood cells, the combs were placed back into the hives; 24 h later the number of cleaned cells was recorded in areas with pin-killed and control brood cells. Four repetitions were made in each colony. Isolated cells were more frequently cleaned than grouped cells, though variance analysis showed no significant difference ($P = 0.1421$). Carniolan bees also were somewhat, though not significantly more hygienic than Africanized honey bees ($P = 0.0840$). We conclude that honey bees can detect and remove both isolated and grouped dead brood. The tendency towards greater hygienic efficiency directed towards grouped

pin-killed brood may be a consequence of a greater concentration of volatiles emanating from the wounds in the dead pupae.

Key words: Hygienic behavior; Pin-killing method; Body fluid; Africanized honey bees; Carniolan honey bees; *Apis mellifera*