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Resistance of Local Efe F1 Honey Bee Ecotype (Apis mellifera anatolica) against Varroa destructor and effects on colony development

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Hygienic behavior, defined as one of the social defense and resistance mechanisms of honeybees, is a highly complex process represented by worker bees detecting infected brood, uncapping the cells and removing them. This behavior is considered a crucial defense mechanism against brood diseases, including those caused by the ectoparasitic mite Varroa destructor.

The effectiveness of hygienic behavior depending on the genetic structure of honeybee species and the geographical conditions which they are located. Türkiye has diverse honeybee species and subspecies, including Apis m. caucasica, A. m. syriaca, A. m. meda, A. m. carnica, and A. m. anatoliaca, along with various ecotypes adapted to different climates. These ecotypes have evolved to withstand regional diseases and environmental conditions. The study focuses on the Efe bee ecotype, which has specifically adapted to the ecological conditions of the western Aegean region.

In this study, the relationship between hygienic behavior and Varroa destructor prevalence in the Efe bee ecotype was examined and the effects of hygienic behavior on colony performance were evaluated by measuring colony development parameters.

According to the results, a statistically significant relationship was found between hygienic behavior and Varroa destructor prevalence in the Efe bee ecotype. However, no significant relationship was observed in subsequent measurements, which can be attributed to various factors such as nectar flow, seasonal variations, and challenges in queen acceptance. In terms of colony development parameters, it was found that Efe bee ecotype showed a higher colony development performance than the average of the existing species and ecotypes in certain periods. The study findings showed that despite the difficulties experienced in the brood rearing process, the brood development of Efe bee ecotype is generally above average and these results draw attention to the performance of local ecotypes in colony development parameters.

It is important to investigate the defense mechanisms such as hygienic behavior in local honeybee ecotypes is important for the development of sustainable beekeeping practices. Understanding the resistance potential of local ecotypes against diseases and pests will reduce dependence on chemical control methods and contribute to the dissemination of economic and sustainable beekeeping practices.