

Assessment of pests and predators, and the performance of honeybee (*Apis Cerana F.*) colonies in Langstroth Modified Beehives (LMB)

ABSTRACT

This study was carried out from June 2016 to December 2019 at the Faculty of Sustainable Agriculture (FSA), Universiti Malaysia Sabah, Sandakan, Malaysia. The objectives of this study were to (i) assess how the prevalence of pests and predators, alongside other factors, may be causing honeybees to abscond from the existing beehives commonly used by local beekeepers; and (ii) investigate the efficacy of newly improved beehives in preventing the intrusion of pests and predators, and the potential impact this has on honeybee health performance. To determine what other factors cause bee abscondment in relation to the prevalence of pests and predators, ten new colonies of *Apis cerana* bees—all with equal health performances were examined for ten weeks in Langstroth Beehives (LBs), which are commonly used by the local beekeepers of Malaysia. To compare honeybee health performance with regard to the efficacy of beehives, ten of the same bee colonies were examined for 20 weeks, also equal in terms of health performance, were introduced to, and studied in, new Langstroth Modified Beehives (LMBs) (5 replications) and LB Beehives (5 replications). The honeybee pests and predators identified during the inspection of the LBs were wax moths, hornets, ants, cockroaches and mites. Combinations of infestation by wax moths, hornets, ants and cockroaches were found in 60% and 90% of LBs, and were determined to be the cause of honeybee abscondment. This, therefore, indicates that one of the significant challenges of beekeeping faced by local beekeepers is the existence of pests and predators in the environment. LMBs had a greater number of frames filled with more than 80% of brood combs (N = 12), honey (N = 24) and pollen storages (N = 19) than LB beehives. Low infestation rates of pests and predators in LMBs could be explained by the improvements made on the beehives' design, which prevented the intrusion of wax moths, cockroaches, and hornets into the hives. Thus, this suggests that improving the beehives' capacity for protecting the bee colonies is crucial in reducing abscondment and increasing bee products.