Physiological effects of pollen substitute feeding on the hemolymph of honeybee workers, hypopharyngeal glands and the productive characters of honeybee colonies

By

Ibrahim Abdel-Samea Abdel-Aziz Ibrahim

B.Sc. Agric. sciences (Plant protection program), (Plant Protection), Faculty of Agriculture, Benha University (2018)

submitted in partial fulfillment of the requirements for the degree of Master of Science

IN

(Entomology)

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SUPERVISION SHEET

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ABSTRACT

In the current study, we evaluated the spirulina, azolla and duckweed as an alternative protein for honeybees compared to pollen and sugar syrup as controls. The consumption rate of diets was investigated and their effects on some physiological and biological measurements of honeybee. After providing diets to honeybee colonies, we observed a positive effect on colony growth, where colonies fed with protein diets produced more brood, honey, pollen and royal jelly than those fed pollen and control colonies despite a lower rate of consumption. Physiologically, the bees that were fed with protein diets had a higher percentage of abdominal lipid and soluble protein content in (hemolymph, head and all body) than the control group and also recorded the longest life span, and the growth of the hypopharyngeal glands (HPG) was higher than the control group and the proteolytic enzyme activity was higher in the midgut of bees in the control colonies than those supplied with protein diets. We conclude that spirulina, azolla and duckweed can be used as an alternative to pollen or as an addition to the diet to improve honeybee health.

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