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IMPACT OF NATURAL AND SUPPLEMENTARY FOODS ON CERTAIN PHYSIOLOGICAL AND PRODUCTIVITY CHARACTERS OF HONEYBEE COLONIES

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ABSTRACT

Sobhia Saied Sayed: Impact of natural and supplementary foods on certain physiological and productivity characters of honeybee colonies. Unpublished Ph.D. Thesis, Department of Plant Protection, Faculty of Agriculture, Ain Shams University, 2022.

This work was conducted in the apiary of Plant Protection Research Institute at El-Quanater, Qaluobia Governorate to study the impact of natural and supplementary foods on certain physiological and productivity characters of honeybee colonies. The productivity characters were evaluated by the activity of collecting pollen, the daily brood rearing rate, the weight of stored honey, and the weight of stored pollen (bee bread). The physiological characters were evaluated by Consumption of food, the longevity of honeybee worker, hypopharyngeal glands development, longitudinal and Transversal of the 2nd wax mirror and some Biochemical Activities in the bodies of honeybee workers. The experiments were conducted during the four seasons (i.e., summer, autumn, winter, and spring). This work was over the course of three years, 2019, 2020 and 2021.

It was found that the highest season in pollen collection activity was the summer season, and the lowest was the autumn season for the year 2019/2020. Feeding with Pollen cake (PC) which is 50 gm of pollen cake + 250 ml of honey solution / colony / 3 days or Brewer's yeast – chick pea pollen cake (YCPC), which is 50 gm of Brewer's yeast – chick pea cake fortified with 4.2% pollen + 250 ml A concentrated sugar solution in the periods when natural food is scarce during the four seasons of the year, summer, autumn, winter and spring, where these two diets helped honey bee colonies to maintain their life and build their strength to enter the main flood season with the largest number of workers represented in measuring the daily brood rearing rate , stored honey and pollen grains within the colony, prolonging the Longevity of workers, increasing the secretion of hypopharyngeal gland represented by an

increase in the area and the number of the lobules/bee, increasing the secretion of wax glands represented by an increase in the longitudinal and Transversal of the 2nd wax mirror, Increasing the activity of digestive enzymes and energy enzymes, which leads to the production of energy that bees need to carry out all their work, whether at the level of the colony for nurse bees, or collecting nectar and pollen during the activity seasons for the forager bees, ventilation in the summer and heating in the winter.

Key words: Collecting pollen, feeding, honeybee colony, protein supplement, carbohydrate supplement, brood rearing, stored honey and pollen, Longevity, hypopharyngeal gland, wax gland, digestive enzymes, and energy enzymes.

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