

**DETECTION OF ADULTERATION AND QUALITY
PROPERTIES OF IMPORTED AND LOCALLY
PRODUCED ROYAL JELLY**

By

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ABSTRACT

Zeinab, Abu Zaid Ashour. Detection of Adulteration and Quality Properties of Imported and Locally Produced Royal Jelly. Unpublished M. Sc. in Economic Entomology (Apiculture), Plant Protection Department, Faculty of Agriculture, Ain Shams University (Economic Entomology).

Experiment was carried out on honey bee colonies in the apiary located at Faculty of Agriculture, Ain Shams University, Shoubra El-Khema, Qualubia. To study the effect of food type with some plant extracts on royal jelly production and physiochemical composition of royal jelly, honey bee colonies were prepared for this study, they were divided into five different groups each group was received one of the following feeding treatments; the first one received extract of sugar bush leaves (*Stevia rebaudiana*) in water, the second group received extract of moringa leaves (*Moringa oleifera*) in honey syrup (67%), the third one received extract of coriander (*Coriandrum sativum*) in honey syrup (67%), the fourth group received honey syrup (67%), and the last one received plain sugar syrup (1 sugar: 1 water). The feeding treatment was continued for three months before starting royal jelly production. To study the quality assurance of royal jelly; Physical properties, chemical composition, microorganisms count and adulteration of royal jelly as well as, effect of storage period on royal jelly quality, own produced royal jelly (Pure royal jelly produced from honeybee colonies in the experimental apiary) during citrus blooming season and pure royal jelly samples produced from honeybee colonies fed on different extracts of some plants in addition local produced and imported royal jelly samples collected from Egyptian market were used in this study. The data summarized that, the number and percentage of accepted queen cells were significantly high in group fed on sugar bush, moringa, coriander extract and plain sugar syrup as compared with group which fed on honey syrup. It also concluded that, honeybee colonies fed on extract of sugar bush,

moringa, coriander and plain sugar syrup produced the highest amount of royal jelly followed by the group which fed on honey syrup. The own produced royal jelly (pure royal jelly samples which produced from honey bee colonies) showed more lightness (L-values= 69.06) as compared with local produced and imported royal jelly samples collected from Egyptian market, since their L-values were (67.98 and 65.62), respectively. The data indicated that, the mean value of moisture in royal jelly samples was (55.06, 62.03 and 61.04 %); The percentage of T.S.S was (15.40, 15.80 and 14.40 %); the T.R.S value was (5.60, 6.40 and 5.20%); the percentage of protein content was (14.38, 12.08 and 9.94%); the percentage of free amino acids was (3.20, 2.60 and 2.40%); the percentage of lipids was (3.22, 6.00 and 5.00%); and Ash content (%) was 4.60, 2.62 and 0.91% in (own pure produced royal jelly from honeybee colonies) local and imported royal jelly collected from Egyptian market, respectively. The sugars found in tested royal jelly samples were glucose, fructose, turanose, saccharose, and maltose with different ratio. The own produced royal jelly sample (royal jelly produced from the experimental honeybee colonies) showed the highest amount of 10-hydroxy-2-deconic acid (10-H₂DA) (41.81%) of the total fatty acid area, while the other local produced and imported sample collected from Egyptian markets showed lowest amount of 10-H₂DA far lower than that of all samples (17.88 to 24.52 %). For local produced and imported royal jelly collected from Egyptian market, respectively for microorganisms count, four bacteria type (*Clostridium botulinum*, *Bacillus cereus*, *Bacillus wakoensis* and *Micrococcus luteus*), two fungi types (*Aspergillus niger* and *Penicillium* spp) and one yeasts types (*Saccharomyces cerevisiae*) were determined according to cultural, morphological and physiological characters. It also concluded that, *Clostridium botulinum* was the most frequency compared with other bacteria types (*B. cereus*, *B.wakoensis* and *Micrococcus luteus*). Meanwhile, *Penicillium* sp fungus was the most frequency compared with *A. niger* fungus. Our data summarized that, no hemocytes or oenocytes and any tissues of queens, workers and drones

larvae of honeybees were found in own produced royal jelly (royal jelly produced from experimental honeybee colonies), meanwhile, they were found in local produced royal jelly collected from Egyptian market and imported royal jelly collected from Egyptian market parts.

Key words: Honey bees, *Apis mellifera*, royal jelly, production, physical properties, chemical composition, 10-HAD, adulteration.

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