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# BEE VENOM COLLECTION AND ITS EFFECT ON ROYAL JELLY PRODUCTION IN HONEY BEE COLONIES

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## ABSTRACT

This study was undertaken in 2011and 2012 in the apiary of Shobra Kubala Quisna, Monofia Gov. The study was undertaken to identify whether honeybee venom collection by coupled electrical stmimulatiom affected Royal jelly In honey bee colonies. The production of Royal jelly was compared between colonies. The result obtained demonstrated that the mean yield of Royal jelly was collected using electrical device was not significantly different than that yield of Royal jelly was collected in control colonies.The aim of this work for new source the anther honeybee prodect to increase income of the apiaries value and for pharmacology and medicine uses for treatment human diseases
(Key wards: honey bee ,bee venom, Royal jelly,)

## INTRODUCTION

Apitoxin, or honey bee venom, is a bitter. Colorless liquid. The active portion of the venom is a complex mixture of proteins, which causes local inflammation and acts as an anticoagulant. The venom is produced in the abdomen of worker bees from a mixture of acidic and basic secretions. Apitoxin is acidic (pH 4.5 to 5.5). A honeybee can inject 0.1 mg of venom via its stinger and similar to nettle toxin. It is estimated that 1% of the population is allergic to bee stings.

Simics (1994) describes devices and publications available from the publisher, and publications by other authors moreover, he briefly describes the characteristics of honey bee (Apis mellifera) venom and the various electrical collecting devices which have been developed to collect it, and discussed the technique of venom collection and the effects on the bees, furthermore, the author concerned with the quality and composition of bee venom, its use in medicine and venom-containing products, including homeopathic medicines, which are available commercially.

There are many studies on the chemical and medicinal properties of the honeybee venoms, at Egypt and Zalat et al.(2002), who analysed the venom composition of the Egyptian Carniolan honeybees Apis mellifera lamarckii, and A. mellifera carnica, in addition to a hybrid with unknown origin using electrophoresis (SDSPAGE). While, in France also David et al. (1997) described the allergenic substances found in Hymenoptera venoms furthermore they described the enzymatic and cytotoxic properties of the phospholipase A2 of the honey bee Apis mellifera and the immune response mediated by T lymphocytes. Also, at Egypt while Khodairy and Omar (2003) determined the relationship between bee venom produced by electrical impulses and certain characters of honey bee colonies (i.e. bee population, brood, stored pollen, stored honey areas and yield and

foraging activity) and the variability of venom quantity collected from colonies at different periods of active season and found significant variations in the amounts of collected venom at different periods of active season, in addition they reported that the amount of venom was high in June compared with that collected in May and July, finally they found positive correlations between venom production and each of the bee population, bee brood, stored pollen, uncapped and capped honey areas and foraging activity. Moreover, while Malaiu *et al.* (1981). Schumacher *et al.* (1994) conducted good experiments on the effect of bee venom collection on bee activity.As for the collection of honeybee venoms, scientists were designed many apertures to collect it i.e., at Fuji,

## MATERIALS AND METHODS

The experiment s were conducted at the apiary of shobra Kubala quisna , Monofia Gov.

Sixteen honey bee colonies equal in both of strength and population were chosen for the experiments each treatment consists of four colonies in addition to check treatment which was represented by four colonies.

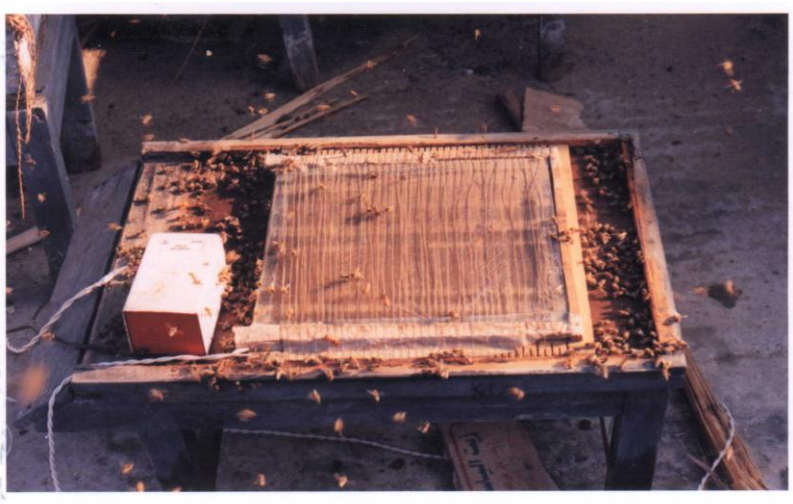
The purpose of this study was to know the effect of the artificial collecting a device designed by Kattab (1997) and Ashhb (2002)( fig 1) on the activity of honey bee colonies for produced Royal jelly.

1-Collecting bee venom and its weights was collected every three days from the period of January to December 2011and 2012.

Collected bee venom was weighted using electrical balance and store in the refrigerator.

2-Royal jelly was produced from experimentally colonies 10 times monthly using the grafting methods the, Royal jelly was collected, weighted using electrical balance and store in the refrigerator.Statistical analysis

Data were analyzed by the computer, using ANOVA test with LSD at 5% level (SAS Institut 2003), in addition to Little and Hills (1978).



**Plat.(1) Bee venom collector device by transformer 220 V. to 12 V. with 1 A.**

**Plat.(2) The plate of bee venom device collector in treatment on the bottom of honeybee hive.**

**Plat.(3) Bee worker is sting the sheet of device plate.**

## RESULTS AND DISCUSSION

**Collecting bee venom**

. effect of bee venom collection on royal jelly production

For estimating the activity of honeybee races on bee venom collection and its effective in royal jelly production. During 2011the result were listed in table (1) result showed that F1 Italian hybrid gave the highest secretion of Royal jelly with an average 181.3 gram/ colony. While on bee venom collection results showed that F1 Carroniolan hybrid give the highest secretion of bee venom with an average 0.38 gram/ colony, Oder the the colonies in bee venom production from high to low during the months following treatment on F1 Italian hybrid were 0.4,0.37,0.36,0.36,0.35 , 0.34 ,0.3 ,0.3 ,0.26 gram / colony months august, july , may , October , September, June, March, April , Fibro ,respectively while the control Order the colonies in the same races were 0.42, 0.41, 0.4 ,0.4 ,0.4 , 0.39 , 0.35 , 0.35 ,0.34 , 0.27 gram / colony months august, October ,july ,September, may, April, June, March ,Fibro ,respectively

In bee venom production from high to low during the months following treatment on F1 Carrniolan hybrid were 0.4, 0.37 , 0.36 , 0.36 , 0.35 , 0.34 , 0.3 , 0.3 gram / colony august , July , May,October,September, June , March , April , Fibro respectively

The royal jelly secretion during (Fabroto to October) showed that the highest amount of Royal jelly produced were for F1Italian hybrid 473 , f1 Carrniolan 440 gram / colony. Whil that the lowest amount of royal jelly produced during month fabro were 137, 147 gram / colony for careniolan F1, italian F1

**Collecting bee venom**

effect of bee venom collection on royal jelly production

For estimating the activity of honeybee races on bee venom collection and its effective in royal jelly production. During 2012the result were listed in table (2) result showed that F1 Italian hybrid gave the highest secretion of Royal jelly with an average 181.3 gram/ colony. While on bee venom collection results showed that F1 Carroniolan hybrid give the highest secretion of bee venom with an average 0.38 gram/ colony, Oder the the colonies in bee venom production from high to low during the months following treatment on F1 Italian hybrid were 0.4,0.37,0.36,0.36,0.35 , 0.34 ,0.3 ,0.3 ,0.26 gram / colony months august, july , may , October , September, June, March, April , Fibro ,respectively while the control Order the colonies in the same races were 0.42, 0.41, 0.4 ,0.4 ,0.4 , 0.39 , 0.35 , 0.35 ,0.34 , 0.27 gram / colony months august, October ,July ,September, may, April, June, March ,Fibro ,respectively

In bee venom production from high to low during the months following treatment on F1 Carrniolan hybrid were 0.45, 0.44, 0.4, 0.38 , 0.36, 0.35, 0.34,and 0.34, gram / colony july, August , Septembe , May, June , October, March, and, April respectively

The royal jelly secretion during (Fabroto to October) showed that the highest amount of Royal jelly produced were for F1Italian hybrid , F1 Carrniolan 453 gram / colony. While that the lowest amount of royal jelly produced during month fabro were 95.2, 85.5 gram / colony for careniolan F1, italian F1

**T 1**

T2

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**جمع سم النحل وتاثيرة على انتاج الغذاء الملكى فى طوائف نحل العسل**

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**كلية الزراعة بمشتهر**

أجري هذا البحث خلال عامي ٢٠١١، ٢٠١٢ بمنحل بشبراقبالة قويسنا منوفية وتهدف هذه الدراسة لايجاد العلاقة بين انتاج سم النحل بواسطة حهاز جمع السم الكهربائى وعلاقته بانتاج الغذاء الملكى فى طوائف البحث وأوضحت الدراسة أن انتاج سم النحل ليس له تأثير معنوى على انتاج الغذاء الملكى فى طوائف المقارنة ( الكنترول ) وترجع أهمية هذا البحث أن انتاج سم النحل بهذه الطريقة اضافة جديدة لمنتجات نحل العسل بالمناحل المصرية لزيادة الطلب عليه لاستخداماته الطبية لمكافحة الأمراض الخطيرة للانسان .

الكلمات الدالة ( نحل العسل – سم النحل – الغذاء الملكى )

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**Table 1 effect of bee venom collection on royaljelly production during 2011**

| | careniolan F1 | | | | | | | | italian F1 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **month/races** | **1** | **2** | **3** | **4** | **total careniolan F1** | **average** | **amaunt of b v** | **B v control** | **1** | **2** | **3** | **4** | **total italian F1** | **average** | **amaunt of b v** | **b v control** |
| fabro | 34 | 36 | 30 | 37 | 137 | 54.8 | 0.3 | 0.33 | 36 | 37 | 34 | 40 | 147 | 56.51 | 0.26 | 0.27 |
| march | 55 | 57 | 50 | 45 | 207 | 82.8 | 0.34 | 0.32 | 57 | 59 | 58 | 65 | 239 | 88.19 | 0.3 | 0.34 |
| april | 59 | 59 | 59 | 55 | 232 | 92.8 | 0.34 | 0.34 | 57 | 55 | 60 | 55 | 227 | 92.02 | 0.3 | 0.35 |
| may | 35 | 50 | 58 | 45 | 188 | 75.2 | 0.38 | 0.4 | 55 | 50 | 66 | 50 | 221 | 80.73 | 0.36 | 0.39 |
| june | 50 | 53 | 55 | 34 | 192 | 76.8 | 0.42 | 0.45 | 56 | 45 | 59 | 45 | 205 | 79.03 | 0.34 | 0.35 |
| july | 35 | 52 | 46 | 40 | 173 | 69.2 | 0.45 | 0.43 | 45 | 44 | 55 | 47 | 191 | 72.27 | 0.37 | 0.4 |
| august | 51 | 44 | 45 | 30 | 170 | 68 | 0.44 | 0.39 | 49 | 55 | 50 | 43 | 197 | 72.57 | 0.4 | 0.42 |
| September | 39 | 43 | 49 | 32 | 163 | 65.2 | 0.47 | 0.45 | 44 | 50 | 45 | 44 | 183 | 68.6 | 0.35 | 0.4 |
| October | 36 | 44 | 40 | 50 | 170 | 68 | 0.35 | 0.4 | 40 | 47 | 43 | 44 | 174 | 68.7 | 0.36 | 0.41 |
| total | 395 | 440 | 435 | 372 | 1632 | | 3.49 | 3.51 | 440 | 444 | 473 | 437 | 1784 | | 3.04 | 3.33 |

**Table 2 effect of bee venom collection on royaljelly production during 2012**

| | careniolan F1 | | | | | | | | italian F1 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | total careniolan F1 | average | amaunt of b v | B v control | 1 | 2 | 3 | 4 | total italian F1 | average | amaunt of b v | b v control |
| fabro | 30 | 36 | 34 | 34.5 | 134.5 | 53.8 | 0.31 | 0.3 | 38 | 37 | 40 | 40 | 155 | 52.9 | 0.3 | 0.26 |
| march | 41.1 | 57 | 49 | 45.3 | 192.4 | 76.96 | 0.32 | 0.34 | 45 | 59 | 54 | 55 | 213 | 74.31 | 0.34 | 0.3 |
| april | 50 | 59 | 54 | 44 | 269 | 95.2 | 0.34 | 0.34 | 55 | 55 | 55 | 54 | 219 | 85.05 | 0.35 | 0.33 |
| may | 45 | 50 | 50 | 50 | 195 | 78 | 0.41 | 0.38 | 57 | 58 | 54 | 50 | 219 | 75.81 | 0.4 | 0.36 |
| june | 36 | 47 | 48 | 51 | 182 | 72.8 | 0.45 | 0.36 | 56 | 47 | 50 | 45 | 198 | 69.78 | 0.35 | 0.4 |
| july | 34.4 | 38 | 47 | 45 | 164.4 | 65.76 | 0.42 | 0.45 | 45 | 44 | 55 | 60 | 204 | 66.92 | 0.4 | 0.37 |
| august | 36.5 | 58 | 38 | 39 | 171.5 | 68.6 | 0.35 | 0.44 | 46 | 55 | 54 | 57 | 212 | 69.67 | 0.4 | 0.4 |
| September | 40 | 55 | 38 | 36 | 169 | 67.6 | 0.3 | 0.4 | 44 | 40 | 45 | 44 | 173 | 63.12 | 0.37 | 0.35 |
| October | 36 | 52 | 30 | 34 | 152 | 60.8 | 0.37 | 0.35 | 40 | 37 | 43 | 44 | 164 | 58.08 | 0.3 | 0.36 |
| total | 350 | 454 | 391 | 382.8 | 1033.9 | | 3.27 | 3.36 | 427 | 434 | 453 | 453 | 1757 | 615.68 | 3.21 | 3.13 |
| average | 71.8 | 87.8 | 86.7 | 74 | 181.3 | 72.5 | 0.38 | 0.39 | 48.7 | 49.11 | 52 | 48.11 | 271.14 | 75.41 | 0.33 | 0.37 |