ABSTRACT
Effect of royal jelly on absolute silk yield of silkworm, Bombyx mori L. was studied during spring season of 2017. Royal jelly was diluted with distilled water to prepare three concentrations (1, 3, and 6 mg/ml.). The obtained results showed that, the concentration 6 mg/ml. of royal jelly occupied the first category to improve larval weight, pupal weight, effective rate of rearing, cocoon shell weight and absolute silk yield when compared to control.

INTRODUCTION
Silk production is dependent on the larval nutrition (Legay, 1958). The Bombyx mori L. is essentially monophagous and survives solely on mulberry leaves which play an important role in the nutrition of the silkworms, and in turn cocoon and silk production (Nagaraju, 2002). The nutritional status of mulberry leaves can be improved by enriching them with extra nutrients to increase larval growth and improve cocoon characteristics (Sengupta et al., 1992). Royal jelly is obtained from Apis mellifera colonies. It contains protein, carbohydrates, beneficial lipids, B complex vitamins including high amount of fatty acids, which are involved in growth, regulation and immunity (Vitek, 1995). The rapid growth and development as well as increasing number of eggs can be obtained by addition of royal jelly to the normal mulberry leaves (Saikatsu et al., 1989). The present study aimed to evaluate the effect of royal jelly on absolute silk yield of silkworm, B. mori.

MATERIALS AND METHODS
During spring season of 2017 at Plant Protection Dept. Fac. of Agric., El Fayoum Univ. To study the effect of royal jelly on absolute silk yield of B. mori, egg box (Egyptian hybrid) was obtained from the Seric. Res. Dept., Plant Protec. Res. Inst, Agric. Res. Center, Dokki, Giza. Royal jelly was diluted with distilled water to prepare different concentrations. Larvae of B. mori were reared on fresh mulberry leaves (Morus alba var. indica) grown in the farm of faculty of Agriculture at Fayoum (at Dar El Ramd region) under laboratory conditions (27±2°C, 65±5% RH). At the beginning of the 5th instar, larvae were divided into four groups (in addition to the control). Each group contained five replicates (each of twenty larvae).
Larvae of *B. mori* were fed daily during the 5th instar on treated mulberry leaves with concentrations (1, 3, and 6 mg/ml. according to preliminary studies which ranged between 0.5 to 9 mg/ml) of royal jelly after drying on ambient air temperature for one minute. While the control was fed on mulberry leaves sprayed with distilled water. Tested parameters (5th instar larval weights, pupal weights, effective rate of rearing, cocoon shell weights and absolute silk yield) were recorded. Data was analyzed by ANOVA through statistical package for social science (SPSS) according to Berkowitz and Allaway, 1998 to find out the significance between treated and control. Means were separated by (L.S.D at 0.05%).

RESULTS AND DISCUSSION

Larval weights:

According to data in Table (1) statistical analysis proved that there were insignificant differences between means of larval weights, where the means ranged between 2.000 g for 1 mg/ml and 2.046 g for 6 mg/ml of royal jelly.

Pupal weights:

The means of the pupal weights ranged between 0.685 g/pupa for control and 0.708 g/pupa for 6 mg/ml of royal jelly According to data in Table (1), statistical analysis proved that there were significant differences between means of pupal weights.

The obtained results are in general agreement with the findings of Nguku et al., 2007 & Gad, Abir, 2013 whom found that, increasing in both larval and pupal weights when using mulberry leaves treated with royal jelly.

Effective rate of rearing:

According to data in Table (2) the effective rate of rearing occupied the 1st category (82.00%) when larvae treated with 6 mg/ml of royal jelly, statistical analysis proved that there were insignificant differences between means of effective rate of rearing.

**TABLE (1): Effect of feeding *Bombyx mori* L. larvae on mulberry leaves treated with different concentrations of royal jelly on some biological parameters.**

<table>
<thead>
<tr>
<th>Concentrations of royal jelly (mg/ml)</th>
<th>Parameters</th>
<th>Mean of weight (g) ±SE</th>
<th>Effective rate of rearing (%) ±SE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5th larval instar</td>
<td>Pupal stage</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2.000±0.0076</td>
<td>0.699±0.0098ab</td>
<td>80.00±0.5669</td>
</tr>
<tr>
<td>3</td>
<td>2.020±0.0099</td>
<td>0.699±0.0090ab</td>
<td>78.00±0.5450</td>
</tr>
<tr>
<td>6</td>
<td>2.046±0.0063</td>
<td>0.708±0.0100a</td>
<td>82.00±0.8971</td>
</tr>
<tr>
<td>Control</td>
<td>2.000±0.0090</td>
<td>0.685±0.0090b</td>
<td>78.00±0.8000</td>
</tr>
<tr>
<td>F test</td>
<td>--</td>
<td>--</td>
<td>*</td>
</tr>
<tr>
<td>LSD at 0.05%</td>
<td>--</td>
<td>0.020</td>
<td>--</td>
</tr>
</tbody>
</table>

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Cocoon shell weights:
According to data in Table (2) the means of cocoon shell weights ranged from 0.169g to 0.178g for 1mg/ml and 6mg/ml of royal jelly respectively, statistical analysis proved that there were significant differences between means of cocoon shell weights. Improving in cocoon shell weights by using mulberry leaves treated with royal jelly take the same trend with Nguku et al.,2007 & Gad, Abir, 2013.

Absolute silk yield:
Data in Table (2) showed that, the highest absolute silk yield (14.59) was obtained at 6 mg/ml of royal jelly. Statistically, it found that there were no significant differences among means of absolute silk yield.

TABLE (2): Effect of feeding Bombyx mori L. larvae on mulberry leaves treated with different concentrations of royal jelly on some economical parameters.

<table>
<thead>
<tr>
<th>Concentrations of royal jelly (mg/ml)</th>
<th>Parameters</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cocoon shell weights (g).</td>
<td>Absolute silk yield.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.169±0.0122b</td>
<td>13.52±0.5779</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.173±0.0090ab</td>
<td>13.49±0.3770</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0.178±0.0988a</td>
<td>14.59±0.8000</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>0.170±0.0880ab</td>
<td>13.26±0.5500</td>
<td></td>
</tr>
<tr>
<td>F test</td>
<td>*</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>LSD at 0.05%</td>
<td>0.009</td>
<td>--</td>
<td></td>
</tr>
</tbody>
</table>

REFERENCES


Nagat, H. Soliman*& Rasha, A. Salim**


تحسین محصول الحریر الخام لدودة الحریر التوتیة باعتنام غذاء المللکات

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الملخص

خلال فصل الربيع لعام 2017 تم دراسة تأثير غذاء المللکات على محصول الحریر. حيث تم تخفيض غذاء المللکات في بالماء لتحضیر التركيزات المختلفة (1، 3، 6 مجم/مللتر). نظیراً للتنتاح أن أفضل تركيز هو 6 مجم/مللتر حيث ادى إلى تحسین وزن البوقة والعذراء وكفاءة التربة ووزن قطرة الشرنقة ومحصول الحریر مقارنة بالكترول.