Studies on The Use Of The Polythene Sheet During Silkworm Rearing
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ABSTRACT
Young mulberry silkworm larvae were reared on polythene sheet and paraffin paper as a bottom and cover during first three instars during spring and autumn season (2015). This investigation was carried out Department of Plant Protection, Faculty of Agriculture, Mansoura, University. Results recorded that using polythene sheet and paraffin paper as cover and a bottom have significant increase on These economical than control parameters. Also results showed that reared during spring was better than autumn season.

INTRODUCTION
Today sericulture is practiced in industrially advanced countries such as Japan and China, as well as Korea and India which are becoming industrialized. Although, sericulture in developing countries had been considered for a long time as a subsidiary occupation in rural areas, recent technological development will be made them possible to practice sericulture on an intensive scale providing greater profits most of agricultural crops (El-Hattab, 1985 and El-Karaksky et al., 1989). Silkworm productivity depends on mulberry leaf for feeding and healthy rearing. Temperature and humidity plays a vary vital role in silkworm growth and quality of the cocoon(Khan., 2014) and rearing with increase of humidity induces diseases (Ganga and Chetty, 1994). Rajabi et al (2007) who found that the quality and quantity of mulberry leaves change due to climatic condition: maintenance of optimum temperature (27-28 °C) and humidity (75%, 5%) are ideal. Using polythene sheet as a bottom gave the best results (Ramaprasada et al., 2004). The present investigation aimed to study the effect of using polythene sheet as a bottom and cover during young instars on silkworm production.

MATERIALS AND METHODS
The present investigation was applied during spring and autumn seasons of 2015. Experiments were carried out in laboratory of Department of Economic Entomology of Agriculture Mansoura University. Mulberry leaves from local variety used for feeding mulberry silkworm larvae eggs of mulberry silkworm collected from Sericulture Research Department – Plant Protection Research Institute – Agricultural Research center- Giza, Egypt. Rearing equipment were washed and disinfected using tap water and formalin solution with 3% concentration. During young silkworm instars polythene sheet used at bottom and cover. As well as paraffin paper applied for bottom and cover. Normal laboratory conditions were kept during rearing. Mulberry leaves were offer four times daily. Net of different sizes applied for cleaning silkworm bed. Three replicates were used for each treatment represented by one hundred larvae. Silkworm larvae reared in carton boxes were used as control.

RESULTS AND DISCUSSION
1-Effect of polythene sheet on silkworm characters.
Cocoon weight:
The data in Table 1 showed that using polythene sheet as a bottom and cover are better than other treatments. Similarly, Ghazy(2008) who found that using polythene sheet as a bottom and cover resulted maximum cocoon weight. Cocoon shell weight:
Using polythene sheet as a bottom and cover gave higher weight (table1). These results are accordance with those founded by Ramaparasadat et al., (2004) who noticed that cocoon shell weight of Bombyx mori L. reared on polythene are highest weight than paraffin paper.
Silk ratio:
Data given in Table 1 clarify that using polythene sheet as a bottom and cover are high value than different treatments. These results are in agreement with Rajanet al.,(1995) who found that using polythene in reared silkworm larvae gave higher average of cocoon shell.

Table (1) Effect of polythene and paraffin as a bottom and cover on silkworm characters

<table>
<thead>
<tr>
<th></th>
<th>5th Larval duration</th>
<th>Cocoon weight (g)</th>
<th>Cocoon shell weight (g)</th>
<th>Pupal weight (g)</th>
<th>Silk ratio %</th>
<th>Larval weight (g)</th>
<th>No egg / female</th>
<th>Egg fertility</th>
<th>Hatchability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polythene</td>
<td>9.70 a</td>
<td>1.64 a</td>
<td>0.402 a</td>
<td>1.24 a</td>
<td>24.4 a</td>
<td>4.011 a</td>
<td>543.78 a</td>
<td>97.73 a</td>
<td>98.82 a</td>
</tr>
<tr>
<td>Paraffin</td>
<td>9.86 b</td>
<td>1.57 b</td>
<td>0.380 b</td>
<td>1.18 b</td>
<td>24.3 b</td>
<td>3.87 b</td>
<td>531 b</td>
<td>97.38 b</td>
<td>98.69 b</td>
</tr>
<tr>
<td>control</td>
<td>10.50 c</td>
<td>1.42 c</td>
<td>0.320 c</td>
<td>1.105 c</td>
<td>22.24 c</td>
<td>3.52 c</td>
<td>510 c</td>
<td>96.67 c</td>
<td>96.95 c</td>
</tr>
</tbody>
</table>
Pupal weight:
Using polythene as a covertreatment acquired heavier weight of pupae than compared to other (Table 1). The previous results are in agreement with the findings of Ghazy (2008) who reported that polythene have highest value for pupae weight than paraffin treatment.

Fifth larval duration:
The results in Table 1are highly significant differences between polythene, paraffin and control. These results are in agreement with Ramaprasada et al., (2004) who found that using polythene during first three instars recorded best larval weight.

Larval weight:
Highly significant differences were obtained between all treatments. Where, polythene treatment was the best results. These results are in accordance with Ramaprasada et al., (2004) who reported that using polythene during first three instars recorded best larval weight.

Fecundity:
Using polythene sheet led to an increase the number of eggs per female as shown in Table 1. These results are according with Ramaparasada et al., (2004) who noticed that, Bombyx mori reared on polythene are highest no egg / female than paraffin paper.

Fertility:
Data in Table 1explained that using polythene sheet as a bottom and cover are higher than paraffin and control. These results are in agreement with Rajan et al., (1995) who found that using polythene in reared silkworm larvae gave higher average of egg fertility.

Hatchability:
Obtained data in Table 1 revealed that, treatment of polythene as a bottom and cover recorded higher average compared to others. These results agreement with Ramaprasada et al., (2004) who explained that cover silkworm larvae during reared with polythene have highest value than paraffin and control.

2- Effect of season on silkworm characters.
The data in Table 2clear that, there were highly significant differences between seasons. Spring season more productivity. Same results were obtained by Harendra et al., (2013) who noticed that spring season showed better growth and cocoon characters followed by autumn season.

Table (2) effect of season on silkworm characters.

<table>
<thead>
<tr>
<th></th>
<th>5th Larval duration (days)</th>
<th>Cocoon weight (g)</th>
<th>Cocoon shell weight</th>
<th>Pupal weight (g)</th>
<th>Silk ratio %</th>
<th>Larval weight</th>
<th>No egg / female</th>
<th>Egg fertility</th>
<th>Hatchability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring</td>
<td>10. 21 a</td>
<td>1.76 a</td>
<td>0.436 a</td>
<td>1.33 a</td>
<td>24.51 a</td>
<td>4.36 a</td>
<td>576.55 a</td>
<td>98.6 a</td>
<td>99.3 a</td>
</tr>
<tr>
<td>Autumn</td>
<td>9. 21 b</td>
<td>1.53 b</td>
<td>0.363 b</td>
<td>1.16 b</td>
<td>23.50 b</td>
<td>3.61 b</td>
<td>507.49 b</td>
<td>96.7 b</td>
<td>97.6 b</td>
</tr>
</tbody>
</table>

3- Interaction between season and treatments.
Data of spring season and polythene show highly significant differences for all characters than that of autumn (Table 3). Similar results were obtained by Ghazy (2008) who found that data recorded during Spring season were better than Autumn for all characters.

Table (3) Effect of Interaction Between Polythene Sheet as A Bottom And Season on Silkworm Characters.

<table>
<thead>
<tr>
<th></th>
<th>5th Larval duration (days)</th>
<th>Cocoon weight(g)</th>
<th>Cocoon shell weight</th>
<th>Pupal weight(g)</th>
<th>Silk ratio %</th>
<th>Larval weight</th>
<th>No egg / female</th>
<th>Egg fertility</th>
<th>Hatchability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polythan X spring</td>
<td>10. 35 a</td>
<td>1.77 a</td>
<td>0.439 a</td>
<td>1.34 a</td>
<td>24.54 a</td>
<td>4.31 a</td>
<td>577.4 a</td>
<td>98.65 a</td>
<td>99.40 a</td>
</tr>
<tr>
<td>Paraffin x spring</td>
<td>10.55 b</td>
<td>1.66 b</td>
<td>0.408 b</td>
<td>1.25 b</td>
<td>24.42 a</td>
<td>4.20 b</td>
<td>565.26 b</td>
<td>98.4 b</td>
<td>99.28 b</td>
</tr>
<tr>
<td>Polythen X autumn</td>
<td>9.15 c</td>
<td>1.52 c</td>
<td>0.370 c</td>
<td>1.15 c</td>
<td>24.28 c</td>
<td>3.72 c</td>
<td>506.1 c</td>
<td>96.64 c</td>
<td>98.19 c</td>
</tr>
<tr>
<td>Paraffin x autumn</td>
<td>9.00 d</td>
<td>1.48 c</td>
<td>0.360 d</td>
<td>1.12 c</td>
<td>24.2 c</td>
<td>3.55 d</td>
<td>498.7 d</td>
<td>96.32 d</td>
<td>98.07 d</td>
</tr>
</tbody>
</table>

In conclusion, the results generally indicated that using polythene sheet as a bottom during spring and autumn season were proved to more efficient in rearing silkworm and gave highest value in all economic characters for silkworm.

REFERENCE
EL- Karaksy, I.A; El-Hattab ,S.M. and Mostafa<sup>1</sup> ,S.M,(1989):Eri.silkworm <i>hilosamiaricinii</i>Boised , powdered pupae as an important source of protein in its semi – artificial diet. 17<sup>th</sup> Arab pesticide Conf., Tanta Univ .118-125.


** دراسات على استخدام البولي اثليين أثناء تربية ديدان الحرير. **

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** يهدف هذا البحث لمقارنة تأثير استخدام البولي اثليين و ورق الأبراج ك غطاء و كالفرش في صواني التربيه خلال وسم الربع والعير الخمس عام 2001 على كفاءة إنتاجه الشراك وطول العمر الخمس. أظهرت النتائج ان استخدام البولي اثليين يؤدي إلى ارتفاع كفاءة إنتاج الشراك و قصر فترة العمر الخمس مقارنة بورق الأبراج و الكنترول. كما أظهرت النتائج ان التربيه اثناء موسم الربع أفضل من موسم الخريف على جميع الخصائص الاقتصادية و إنتاج الشراك. **