RESULTS
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The present study was carried out under the laboratory conditions to assess the toxicity of different plant extracts and also their combinations with chemical pesticides, monocrotophos and endosulfan against the two polyphagous pests i.e. *Spodoptera litura* and *Helicoverpa armigera*. These two pests were reared in our laboratory conditions and their life cycles were studied, which are described below along with their systematic position:

**Life cycle of Spodoptera litura (Figure 1):**

- **Scientific Name**: *Spodoptera litura* (Fabricius)
  - Tobacco caterpillar, Tobacco cutworm,
- **Common Name**: Cotton leafworm, Rice cutworm,
  - Tobacco budworm, Tropical armyworm
- **Class**: Insecta
- **Order**: Lepidoptera
- **Family**: Noctuidae
- **Genus**: *Spodoptera*
- **Species**: *litura*
- **Author**: Fabricius
Fig. 1. Life cycle of Spodoptera litura (Fabricius)
*Spodoptera litura* (Fabricius) is an important polyphagous foliage feeder damaging tobacco, maize, sorghum, millet, pulses, sugarcane, groundnut, cotton and many vegetable crops in India. The pest completes its life cycle in 43-63 days.

**Eggs**

Egg masses (4-7 mm diameter) laid at night in clusters of 200 to 300, are covered with the brown scales detached from the abdomen of the female with. The eggs take 3-4 days to hatch.

**Larvae**

The larvae cluster together, feeding on the surface layers of the leaf. Larvae are variable in colours: young are pale green and latter instars are dark green to brown. Although colouration is variable, the bright yellow stripe along the dorsal surface is characteristic. The order larvae are night feeders but usually remain on the plants during the daytime.

The larvae go through six instars (although five and seven have also been reported) lasting from 13-30 days, depending on temperature.

**Pupae**

The pupal period lasts for 7-10 days. The pupae are dark reddish brown in colour.
Adults

The adults are grayish-brown, 15-20 mm long with a wingspan of 30-38 mm. The forewings are grey to reddish-brown with a strongly variegated pattern and paler lines along the veins; the hindwings are grayish-white with grey margins. Females mate three or four times during their lifetime, and lay up to 2500 eggs. Adults are nocturnal, strong flyers and are attracted to lights.

Total development period in days at 25±2°C

Hatching of eggs 3-5
Larval period 13-30
(Larva to full grown caterpillar)
Pupal period 7-10
Total life cycle 43-63 days
**Life cycle of *Helicoverpa armigera* (Figure 2):**

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>: <em>Helicoverpa armigera</em> (Hubner)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Name</td>
<td>: Gram pod borer, cotton bollworm,</td>
</tr>
<tr>
<td></td>
<td>Tobacco budworm, Tomato fruit borer,</td>
</tr>
<tr>
<td></td>
<td>Corn earworm</td>
</tr>
<tr>
<td>Class</td>
<td>: Insecta</td>
</tr>
<tr>
<td>Order</td>
<td>: Lepidoptera</td>
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<tr>
<td>Family</td>
<td>: Noctuidae</td>
</tr>
<tr>
<td>Genus</td>
<td>: <em>Helicoverpa</em></td>
</tr>
<tr>
<td>Species</td>
<td>: <em>armigera</em></td>
</tr>
<tr>
<td>Author</td>
<td>: Hubner</td>
</tr>
</tbody>
</table>

*Helicoverpa armigera* (Hubner) is a serious pest of many agricultural crops. Being polyphagus it is major pest of chickpea, pigeon pea, peas, cow pea, tomato, cotton, sorghum, groundnut, tobacco, potato, maize, number of fruits and vegetables. It has life cycle of 42-45 days.

**Eggs**

Eggs are pomegranate-shaped (0.4-0.6 mm diameter) and a female may lay over 3000 eggs mainly at night singly on its host plant. The eggs take 2-5 days to hatch.
Fig. 2. Life cycle of *Helicoverpa armigera* (Hubner)
Larvae

The young larvae usually eat some or the entire empty eggs hell before feeding on the host plant. Newly emerged neonates move around for some distance before settling down at a preferred site encounters between older larvae usually results in cannibalism. The larval period ranges from 17 to 20 days. The weights of fully-grown larvae differ considerably with diet. The number of larval instars varies from 5 to 7 with six being most common. Sometimes due to differences in temperature and other rearing conditions, there is exclusion or inclusion of pre-pupal stage in the larval period.

Pupae

Pre-pupal stage is shorter and stouter, with a uniform color, and last for 1 to 4 days. The duration of the pupal stage depends on whether or not diapause has been induced during the earlier life stages. In the non-diapausing pupae, the pupal period from about 6 days at 30°C to over 30 days at 15°C. In the diapausing pupae, the pupal period may last for several months. The pupae are 14 to 22 mm long and 4.5 to 6.5 mm in width across the thorax. Pupae are mahogany – brown smooth – surfaced, and rounded both at the anterior and posterior ends with two parallel spines at the posterior tip.
Adults

The adults are stout bodied moths, with a wingspan of 35 to 40 mm and a body length of 18 to 19 mm. The general colour varies from dull grayish yellow, buff to olive grey and light brown to blackish markings on the wings. Hindwings usually paler and forewings generally tinged with green. Females are darker and the forewings without a green tinge. Male *H. armigera* are pale cream. Longevity of adults depends upon the availability of food such as sucrose or nectar activity. The adult longevity under laboratory conditions may not be similar to that under natural condition in the field. In captivity the longevity varies from 1 to 23 days for males and 5 to 28 days for females.

Total developmental period in days at 25±2°C

<table>
<thead>
<tr>
<th>Stage</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egg-Neonate</td>
<td>3</td>
</tr>
<tr>
<td>Neonate-Late 1st instar</td>
<td>3</td>
</tr>
<tr>
<td>Early 2\textsuperscript{nd} – Late 2\textsuperscript{nd} instar</td>
<td>4</td>
</tr>
<tr>
<td>Early 3\textsuperscript{rd} – Late 3\textsuperscript{rd} instar</td>
<td>4</td>
</tr>
<tr>
<td>Early 4\textsuperscript{th} – Late 4\textsuperscript{th} instar</td>
<td>4</td>
</tr>
<tr>
<td>Early 5\textsuperscript{th} – Late 5\textsuperscript{th} instar</td>
<td>4</td>
</tr>
<tr>
<td>6\textsuperscript{th} instar – Pupae</td>
<td>6</td>
</tr>
<tr>
<td>Pupae – Moth</td>
<td>14</td>
</tr>
<tr>
<td>Total Life Cycle</td>
<td>42-45 days</td>
</tr>
</tbody>
</table>
The complete understanding of the biology of the two chosen pests lead to the maintenance of their culture in conducive laboratory condition. Separate experiments were carried out to study the toxic effects of different plant extracts and their combination with the chemical pesticides, monocrotophos and endosulfan against the larvae (3rd instars) eggs (1-3 days old) of the two pests.

In our laboratory conditions, experimental sets up were maintained up to 72 hrs and after 24, 48 and 72 hrs duration number of dead insect larvae (mortality) was counted which was compared with their corresponding controls. In every set up five concentrations of plant extracts i.e. 2, 4, 6, 8 and 10% were used when alone, and in combinations they were mixed in 1, 2, 3, 4 and 5% concentrations with the chemical pesticides. Application of these concentrations of plant extracts on the 3rd instar larvae of the insects lead to a trend of general increase of per cent mortality with respect to the increase in the concentration. The present study deals an extensive data but an approach is made to brief the findings in a systematic order for better understanding. Hence, the results obtained in different experiments are described as follows:
1. **Insecticidal activity**

   **A. Toxicity of plant extracts against *S. litura* and *H. armigera* larvae**

   The results obtained showed maximum mortality at the highest concentrations of plant extracts used during the present investigations. Therefore, comparison of the efficacy has been determined on the basis of the comparison of per cent mortality of larvae at the highest concentration used.

   Table-1A revealed that the maximum and minimum toxicities were shown by *A. indica* (SKE) and *P. hysterophorus* (LE) at 10% concentrations against *S. litura* larvae. After 24 hrs of treatment, the maximum and minimum mortalities of around 36 and 13.33 per cent at 10% concentration of *A. indica* (SKE) and *P. hysterophorus* (LE) were observed (Table-1A) which increased to 42.66 and 21.33 per cent after 48 hrs and, 46.66 and 25.33 per cent, respectively after 72 hrs of treatment (Table-1B, C).

   Whereas, in *H. armigera* larvae maximum and minimum mortalities of 34.66 per cent and 10.66 per cent were recorded after 24 hrs of treatment with 10 per cent concentrations of *A. indica* (SKE) and *P. hysterophorus* (LE). After 48 hrs of treatment of *H. armigera* larvae, the mortalities were recorded 41.33 per cent and 22.66 per cent which
increased further after 72 hrs to 44 per cent and 26.66 per cent against 10% concentrations of *A. indica* (SKE) and *P. hysterophorus* (LE) respectively (Table-2A-C).

The values of different statistical parameters applied for *S. litura* and *H. armigera* are presented in Table-3A and B. Table-3A revealed the value of slope (m) to be maximum (2.70) for *A. indica* (SKE) and minimum (1.70) for *P. hysterophorus* (LE) indicated a better efficacy of *A. indica* (SKE) for *S. litura*, which is also evidenced from its highest value of intercept (b=13.6) and lowest value of LC$_{50}$ (0.0336). Numerical values obtained for the coefficient of determinant ($r^2$) showed highest magnitude (0.995) for *A. sativum* (BE) and the lowest (0.95) for *A. conyzoides* (LE) respectively designated a fairly good relationship between the concentrations of *A. sativum* (BE) applied here and the per cent mortality observed. Like *S. litura*, values for slope (m=2.60) and intercept (b=12.2) were also recorded highest whereas least LC$_{50}$ value (0.026) were calculated for *A. indica* (SKE) against *H. armigera* (Table-3B). Further, the statistical analyses showed that *A. sativum* (BE) bears a proportional relationship between the concentrations applied and per cent mortality *H. armigera* larvae.

Therefore, on the basis of cumulative analyses of different constraints as given in Table-3A and B, the treatments against *S. litura*
and *H. armigera* were ranked in the following order of efficacy based on LC$_{50}$ values.

**S. litura:**


**H. armigera:**


Using the software program the regression analysis was carried out. Raw data was provided to the statistician at the Computer center of the University. Processed data showed a linear relationship of different concentrations of plant extracts versus the per cent mortality of the chosen insect larvae (Fig. 3A and B). Further, the values of slope and intercept obtained from the formulae (as given in the Materials and Methods) for different plant extracts against the *S. litura* and *H. armigera* larvae have been described in the above paragraphs.

**B. Toxicity due to chemical pesticides against *S. litura* and *H. armigera* larvae** Since the present study is an attempt to propose a relatively safer method for pest management, therefore the toxicities due
to plant extracts were compared with the chemical pesticides alone as well as with their combinations. During the present work, two chemical pesticides namely monocrotophos (0.04%: w/v) and endosulfan (0.07%: w/v) were used against the two economically important pests (Table-4). Available data showed better efficacy of endosulfan over monocrotophos at all the durations against the pests. Significantly higher mortality values of 77.33 and 74.66 per cent were noted for endosulfan after 72 hrs of treatment against *S. litura* and *H. armigera* respectively. The obtained values with respect to control (DDW) were significantly effective (Table-4).

C. Toxicity of some plant extracts in combination with chemical pesticides against *S. litura* and *H. armigera* larvae

i) In combination with monocrotophos

For the present experimental set up, concentrations of plant extracts used were 1, 2, 3, 4 and 5%, which were separately mixed with 0.02% of monocrotophos. The results showed that the 5% concentration of *A. indica* (SKE) in combination with monocrotophos was most effective at all the durations and indicated 50.66, 58.66 and 64 per cent mortality after 24, 48 and 72 hrs respectively, against *S. litura* larvae (Table-5A-C). Whereas, least mortality was observed for *A. sativum* (BE) after 24 hrs (37.33 per cent), *P. hysterophorus* after 48 (41.33) and due to both *A.*
*sativum* (BE) as well as *P. hysterophorus* after 72 (46.66) hrs against *S. litura*.

While applying the combination of monocrotophos to *H. armigera*, mortality values were recorded maximum for 5% concentration of *A. indica* (SKE) after 24 (48 per cent), 48 (57.33 per cent) and 72 hrs (62.66 per cent) of treatment (Table-6A-C). Least per cent mortality was shown by *P. hysterophorus* (LE) after 24 (25.33 per cent) and 48 hrs (37.33 per cent) respectively. However, after 72 hrs of treatment minimum mortality was recorded for *A. sativum* (BE) against the *H. armigera* larvae. The values were significantly higher when compared with the control.

**ii) In combination with endosulfan**

Here, the concentration of endosulfan used in the combination was 0.035% (w/v) that was also separately mixed with different plant extracts.

Similar to the combination made with monocrotophos to treat *S. litura* larvae, combination with endosulfan also showed its maximum efficacy with *A. indica* (SKE) after 24 (53.33 per cent), 48 (65.33 per cent) and 72 hrs (70.66 per cent) treatment (Table-7A-C). Whereas, combination of endosulfan with *A. sativum* (BE) recorded its least mortality per cent at all the treatment durations.
Like in case of *S. litura*, combination of endosulfan with 5% concentration of *A. indica* (SKE) resulted in maximum mortality of *H. armigera* larvae at all the selected treatment durations, which ranged from 50.66 to 64 per cent. Minimum values were noted at all the treatment durations for *P. hysterophorus* (LE) combinations (Table-8A-C).

2. **Ovicidal activity**

A. **Ovicidal action of plant extracts against *S. litura* and *H. armigera***

As revealed from Table-9 (A-C), the maximum mortality of *S. litura* eggs was evaluated for *A. indica* (SKE) after 24 (34.66 per cent), 48 (39.33 per cent) and 72 hrs (44.66 per cent) treatment respectively, whereas least was due to the *P. hysterophorus* (LE) at 10% concentrations of the extracts.

Almost similar type of efficacy pattern was noted in case of *H. armigera* eggs when treated with 10% concentrations of *A. indica* (SKE) and *P. hysterophorus* (LE) for 24, 48 and 72 hrs respectively (Table-10A-C). *A. indica* (SKE) appeared to show higher ovicidal activity (42 per cent after 72 hrs treatment) while *P. hysterophorus* (LE) demonstrated least ovicidal activity (22 per cent after 72 hrs treatment).
Table-11 (A and B) demonstrated the summary of statistical calculations for ovicidal action of plant extracts against *S. litura* and *H. armigera*. Maximum values of slope (m=2.7) and intercept (b=11.4) were obtained for *A. indica* (SKE) against *S. litura* eggs whereas minimum (m=1.7; b=2.2) for *P. hysterophorus* (LE), which indicated a better ovicidal efficacy of *A. indica* (SKE) among the used plant extracts. Further, the higher values of determinant coefficient ($r^2=0.987$) as well as LC$_{50}$ (0.0293) for *P. hysterophorus* (LE) and lesser ($r^2=0.964$; LC$_{50}$=0.0132) for *A. indica* (SKE) also supported the above findings against the eggs of *S. litura* (Table-11A).

As in case of *S. litura*, the magnitude of slope (m=2.65) and intercept (b=8.70) was also obtained maximum for *A. indica* (SKE) and minimum (m=1.4, b=2.8) for *P. hysterophorus* (LE) against the eggs of *H. armigera*. The perusal of table-11B revealed the summary of statistical calculations for the ovicidal action of plant extracts against *H. armigera*. However, the highest LC$_{50}$ (0.0326) was recorded for *P. hysterophorus* (LE) and lowest (0.0169) for *A. indica* (SKE) indicated the better ovicidal action and efficacy of later extract (Table-11B).

Therefore, on the basis of ovicidal activity taken up in the present study (Tables-11A and B), the order of toxicity of treatments (based on
the LC$_{50}$ values) against eggs of the two insects may be proposed as given below:

**S. litura:**


**H. armigera:**


Regression analysis of the data obtained for the ovicidal action of different plant extracts used at various concentrations against the eggs of *S. litura* and *H. armigera* was carried out using software programme. Similar to the pattern as obtained for the larvae of the above pests, regression lines were plotted between the per cent concentrations of plant extracts used and the eggs mortality of *S. litura* (Fig-4A) and *H. armigera* (Fig-4B). The regression plots illustrated a linear relationship with variable magnitude of slope (m), intercept (b) and determinant coefficient ($r^2$) between the chosen factors.
B. Ovicidal action of chemical pesticides against *S. litura* and *H. armigera*

The ovicidal action of monocrotophos and endosulfan was evaluated against the *S. litura* and *H. armigera*. These chemical pesticides were used in 0.04% (w/v) and 0.07% (w/v) concentrations and their treatments were given for 24, 48 and 72 hrs respectively. It is envisaged that the endosulfan had its higher ovicidal potential at all the durations in case of both the pests. The values were unambiguously significant with respect to ovicidal action recorded in control (Table-12).

C. Ovicidal action of some plant extracts in combination with chemical pesticides against *S. litura* and *H. armigera*

i) In combination with monocrotophos

Different plant extracts used to test their ovicidal effect in combination with chemical pesticides were used in 1, 2, 3, 4, and 5% concentrations. With every plant extract, 0.02% of monocrotophos was mixed and their action against *S. litura* and *H. armigera* was evaluated, which is summarized in Table-13 and 14.

The data presented in Table-13 (A-C) revealed the highest ovicidal potential for the combination of 5 per cent concentration of *A. indica* (SKE) with monocrotophos at all the selected durations against the *S.*
However, lowest ovicidal potential was demonstrated by A. sativum (BE) after 24 hrs (30 per cent) and P. hysterophorus (LE) after 48 (32 per cent) and 72 hrs (40 per cent) of treatment.

Though in case of H. armigera maximum values of ovicidal activity were recorded for 5 per cent concentration of A. indica (SKE) combined with monocrotophos at all the treatment intervals, but the minimum ovicidal activity was shown by the combination of both the P. hysterophorus (5%, LE) after 24 and 72 hrs as well as A. sativum (5%, BE) after 48 hrs of treatment (Table-14A-C).

ii) In combination with endosulfan

The perusal of the data presented in Table-15 (A-C) revealed that the maximum ovicidal action is possessed by the 5% concentration of A. indica (SKE) combination with the endosulfan (0.035%) at all the selected treatment durations against the S. litura. However, the minimum activity was demonstrated by the A. sativum (BE) after 24 hrs (31.33 per cent) and P. hysterophorus (LE) after 48 (36.66 per cent) and 72 hrs (40 per cent), respectively.

Results of ovicidal activity of different plant extracts in combination with 0.035% concentration of endosulfan against H. armigera are presented in Table-16 (A-C). In case of H. armigera also, A. indica (SKE) combination showed highest ovicidal efficacy in contrast to
the combination of *P. hysterophorus* (LE) for which least efficacy was recorded against *H. armigera* at 24, 48 and 72 hrs respectively. The differences in the evaluated values of ovicidal action of the combinations and the control were highly significant (*P*<0.05).

Chi-square (*χ*²) analysis and rank correlation for hourly treatment was calculated by using software programme. The values for chi-square obtained are summarized in Table-17 and were highly significant at their respective degrees of freedom (*P*<0.05; df=8).

The data was treated separately for plant extracts and their combinations with chemical pesticides i.e. monocrotophos and endosulfan against the larvae, *S. litura* and *H. armigera*. Chi-square (*χ*²) contingency (3×5) test was applied to test the significant differences in the mortality values of insect larvae / eggs against plant extracts as well as their combination with chemical pesticides after 24, 48 and 72 hrs. All the chi-square, values obtained were highly significant with respect to control (*P*<0.05, *χ*² value = 15.5, df=8), however values relatively with higher magnitude of chi-square were observed for plant extracts against *H. armigera* (larvae) (*χ*² value = 5.82, df=8), for the combination of plant extracts with monocrotophos (*χ*² value = 6.33, df=8) against *H. armigera* (larvae) and for the combinations of plant extract with endosulfan against
the eggs of *S. litura* and *H. armigera* ($\chi^2_c$ value = 4.24, df=8; $\chi^2_c$ value = 7.12, df=8), respectively (Table-17).

Rank correlation of the hourly treatments (24–48hrs; 48–72hrs; 72–24hrs) of the plant extracts and their combinations with chemical pesticides against the larvae and eggs of *S. litura* and *H. armigera* was also evaluated and presented in Table-17. The maximum values of rank correlation were obtained after 48–72hrs duration in all the treatment categories against the larvae of chosen insect pests. Whereas in case of eggs also, the maximum values of rank correlation for plant extracts against *S. litura* and *H. armigera* were noted at 48–72hrs duration. However, in combination of plant extracts with monocrotophos and endosulfan, the highest values of rank correlation against *S. litura* and *H. armigera* were observed at 24–48 hrs and 48–72 hrs, respectively.

The bar diagram shown in Fig-5 illustrates variation in the correlation values (r) plotted between the mean mortality of larvae / eggs after 24, 48 and 72 hrs duration and the plant extracts (Fig. 5A); plant extracts in combination with monocrotophos (Fig. 5B) and endosulfan (Fig. 5C). On the whole the data presented in Fig-5 is in accordance with the values observed for rank correlation. The maximum values of correlation were obtained after 24 hrs duration for the plant extracts as
well as their combinations with monocrotophos against *S. litura* (larvae) (Fig. 5A and B). However, equal values of correlation after 24 and 48 hrs were obtained for the combination of plant extracts with endosulfan against *S. litura* (larvae). Correlation value recorded for plant extract after 24 hrs of treatment against *H. armigera* larvae (Fig-5A) was lesser than the values calculated for both the combinations used against *H. armigera* after 48 hrs of treatment.

As far as the values of coefficient of correlation in case of eggs of *S. litura* and *H. armigera* are concerned, almost a similar pattern was noted as in case of their respective larvae during different treatment hours. However, values of lower magnitude were recorded for eggs of the two pests against different treatments indicated a relatively fair relationship between the mean mortality of the eggs and the treatment concentrations.

3. **Effect on the oviposition**

A) **Effect of plant extracts on the oviposition of *S. litura* and *H. armigera***

Effect of different plant extracts on the oviposition of *S. litura* and *H. armigera* was evaluated at three different concentrations of plant extracts viz. 2, 5 and 10%. The summary of the results obtained for *S. litura* and *H. armigera* is as follows:
i) *S. litura*

The selection of oviposition sites in choice experiment showed that the female gave less preference to the sites those were treated with different concentration of plant extracts. A sort of reciprocal relationship between the eggs laid by the *S. litura* female and the concentration of plant extracts was detected wherein, the increase in concentration of plant extracts decreased the number of eggs laid on the treated sectors/strip (Table-18A). At 10% concentration of *A. indica* (SKE), average number of eggs laid on the treated strips or sectors recorded were 18.66 whereas on strip treated with *P. hysterophorus* (LE) the value increased to 49.66, which are the minimum and maximum values of average number of eggs laid. Another parameter of eggs hatching (viability) was also taken into consideration that also showed a similar pattern of values as that of eggs laid with respect to concentrations used. Here also the maximum (32.666) and minimum (11.33) values of eggs hatched were recorded for *P. hysterophorus* (LE) and *A. indica* (SKE) respectively (Table-18A, Fig-6A). Slight variation in the incubation period was observed with increase in the concentration of plant extracts (Fig. 7A). As for the incubation period, direct relationship with the concentrations of plant extracts used was noticed. The maximum value (6 days) of incubation period was observed in case of strip/sectors treated with 10 per cent concentration of
A. indica (LE) whereas incubation period of 4 days was recorded due to the treatments of A. conyzoides (LE) and P. hysterophorus (LE) (Table-18A; Fig-7A).

The perusal of table-18A also revealed the existing differences in the oviposition index at various concentrations of plant extracts. At 10% concentration of plant extracts, maximum (0.62) and the minimum (0.233) oviposition indices were obtained for P. hysterophorus (LE) and A. indica (SKE) respectively. The highest value (0.755) of oviposition index was shown by the treatment with 2% concentration of P. hysterophorus (LE).

ii) H. armigera

Similar trend of change in the values of eggs laid, eggs hatched, incubation period and oviposition index as recorded for S. litura, was received in case of H. armigera (Table-18B; Fig-8A, 9A) that showed highest efficacy of A. indica (SKE) and lowest of P. hysterophorus (LE) at their 10% concentrations. Moreover, longevity of the same duration in the incubation period of 4 days was recorded due to E. globulus (LE), A. conyzoides (LE), N. indicum (LE), P. hysterophorus (LE) and A. sativum (BE), whereas 10 per cent concentration of A. indica (SKE) showed an increase in the incubation period to 6 days (Table-18B, Fig-9A).
B) **Effect of plant extracts in combination with chemical pesticides on the oviposition of* S. litura* and* H. armigera**

i) **In combination with monocrotophos**

Plant extracts in combination with chemical pesticides were also tested against the eggs of two pests. The concentrations of plant extracts used with 0.02% monocrotophos to assess the parameters were 1, 2.5 and 5% respectively. The data obtained for oviposition of *S. litura* is presented in Table-19A; Fig-6B, 7B. The maximum effectiveness of *A. indica* (SKE) combination with monocrotophos against *S. litura* appeared clearly, which is very much obvious with its minimum values of eggs laid (5.66), eggs hatched (2.33) and oviposition index (0.072) at 5% concentration. In contrast to this, *P. hysterophorus* (LE) and *D. alba* (SE) recorded their minimum effectiveness that is visible with their observed maximum values for eggs laid, eggs hatched and oviposition indices (Table-19A). Further, 5% concentrations of *A. indica* (SKE), *A. indica* (LE) and *L. camara* (LE) separately in combination with monocrotophos also increased the incubation period of *S. litura* to 6 days which is significant as compared to control (Table-19A, Fig-7B).

In case of *H. armigera*, highest effectiveness was observed for 5% concentrations of *A. indica* (SKE) and lowest for *P. hysterophorus* (LE) when combined with monocrotophos. The values recorded for eggs laid,
eggs hatched, incubation period and oviposition index due to combination of *A. indica* (SKE) with monocrotophos were 17, 11.66, 6 and 0.206 respectively; whereas these values were 53.33, 42.66, 4 and 0.647 when the combination was made of 5% concentration of *P. hysterophorus* (LE) with monocrotophos (Table-19B; Fig-8B). The increase in the incubation period from 3 to 6 days was also put on record that was as a result of treatment with 5% concentrations of *A. indica* (SKE), *A. indica* (LE) and *E. globulus* (LE) combination with monocrotophos (Fig-9B).

ii) **In combination with endosulfan**

The perusal of table-20A revealed a trend of oviposition parameters similar to the combinations of plant extracts used with monocrotophos against the two pests, as described in the above paragraph. In the present case the concentration of different plant extracts taken was same as that used with monocrotophos but here the concentration of endosulfan with which the combinations were prepared was 0.035% (w/v). The data presented in Table-20A demonstrated that 5% concentration of *A. indica* (SKE) in combination with endosulfan possessed highest efficacy against *S. litura* and values obtained for eggs laid, eggs hatched, incubation period and oviposition index were 9.33, 5.66, 7 and 0.106 respectively (Fig-6C, 7C). Like in case of combinations of plant extracts with monocrotophos against *S. litura*, combination of 5%
concentration of *P. hysterophorus* (LE) with endosulfan appeared to be least toxic as indicated by their higher values of eggs laid (29.33), eggs hatched (22.33) and oviposition index (0.334) on the treated surface.

Results parallel to *S. litura* (discussed in the above paragraph) were obtained in case of *H. armigera* for different parameters of oviposition included in the present study (Table-20B). Treatments with the combination of 5% concentration of *A. indica* (SKE) and 0.035% endosulfan resulted in reduced values of eggs laid (15), eggs hatched (8.66) and oviposition index (0.193) (Fig-8C); whereas an increase in the incubation period of the eggs (6 days) of *H. armigera* was also recorded for *A. indica* (SKE) which indicated its better efficacy (Fig-9C). Treatments of 5% concentrations of *P. hysterophorus* (LE) in combination with endosulfan showed a lesser efficacy against the eggs of *H. armigera*, which is obvious with the obtained values of eggs laid (44), eggs hatched (37.66) and oviposition index (0.573) (Table-20B).

Statistical analyses further showed that the observed values for different treatment categories in all the combinations applied for *S. litura* and *H. armigera* were significantly higher with respect to control (*P*<0.05).
4. Antifeedant Activity of Plant Extracts

All the nine plant species alone as well as in their combinations with chemical insecticides were tested for their antifeedant activity against the 3rd instar larvae of *S. litura* and *H. armigera*. The value of preference index (C-values) for each treatment category was calculated following the protocol outlined by Kogan and Goedan (1970). Therefore, the classification of plant extracts for their antifeedant activity was carried out on the basis of C-values (preference index) which is given below:

<table>
<thead>
<tr>
<th>C-values</th>
<th>Level of activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1–0.25</td>
<td>Extremely antifeedant</td>
</tr>
<tr>
<td>0.26–0.50</td>
<td>Strong antifeedant</td>
</tr>
<tr>
<td>0.51–0.75</td>
<td>Moderately antifeedant</td>
</tr>
<tr>
<td>0.76–0.99</td>
<td>Slightly antifeedant</td>
</tr>
<tr>
<td>&gt;1</td>
<td>Preferred</td>
</tr>
</tbody>
</table>

Effect of plant extracts and their combinations (with pesticides) on the feeding activity of *S. litura* and *H. armigera*

It is generally known that the feeding preference of insects varies and for that reason in routine laboratory rearing set up (culture) those
plants are advised to which the insects like most and feed upon. Thus, the parameter of evaluating the antifeedant activity of plant extracts alone as well as in their combination with two chemical pesticides i.e. monocrotophos and endosulfan against the two economically important pests, *S. litura* and *H. armigera* was taken into consideration.

i) **Antifeedant activity of Plant extracts**

Table-21A revealed that *A. indica* (SKE) possessed C-value of 0.577 that could be categorized to show moderately antifeedant activity against *S. litura*. On the contrary, *A. sativum* (BE) showed slight antifeedant activity with a C-value of 0.919. However, none of the plant extracts used in the present category demonstrated either extreme or strong antifeedant activity.

In case of *H. armigera*, highest antifeedant activity was shown by *E. globulus* (LE) with the C-value of 0.840 while *P. hysterophorus* (LE) possessed slight antifeedant activity with a C-value of 0.972 (Table-21B).

ii) **In combination with monocrotophos**

*A. indica* (LE) in combination with monocrotophos was noted to possess strong antifeedant activity (C-value=0.339). On the other hand, *P. hysterophorus* (LE) with a recorded least C-value 0.537 against *S. litura* was categorized to have moderate antifeedant activity (Table-22A).
*A. indica* (SKE) in combination with monocrotophos showed C-value of 0.299, and hence it could be attributed to bear the category of strong antifeedant activity against *H. armigera* (Table-22B). However, *A. sativum* (BE) in combination with monocrotophos with highest C-value of 0.560 against *H. armigera* showed moderate antifeedant activity.

**ii) In combination with endosulfan**

The highest antifeedant activity for *A. indica* (SKE) with endosulfan was obtained (C-value=0.337) against *S. litura* while the least antifeedant activity (C=0.562) was noted for the combination of *P. hysterophorus* (LE) with endosulfan (Table-23A).

The data presented showed highest antifeedant activity (C=0.333) for the combination of *A. indica* (SKE) with endosulfan and lowest (C-value=0.581) for *P. hysterophorus* (LE) against *H. armigera* (Table-23B).

Percent transformed feeding area of the larvae was also evaluated to demonstrate the feeding intensity of the two pests i.e. *S. litura* (Fig-10) and *H. armigera* (Fig-11).

It was noticed that the maximum feeding area (91.9 per cent) of castor leaves treated with *A. sativum* (BE) was consumed by the *S. litura* larvae while minimum value (57.7 per cent) was recorded against *A. indica* (SKE) (Fig-10A).
Fig-10B illustrates the per cent transformed feeding area value against plant extracts in combination with monocrotophos. The maximum value (53.7 per cent) was obtained against *P. hysterophorus* (LE) while minimum (33.9 per cent) against the *A. indica* (LE) in combination with monocrotophos.

Different plant extracts were also combined with endosulfan and the per cent transformed feeding area values were evaluated (Fig-10C). The data showed that *P. hysterophorus* (LE) in combination with endosulfan proved to possess least antifeedant activity with a maximum value (56.2 per cent) of feeding area among all the treatments used in the present study. On the contrary, minimum value (33.7 per cent) was recorded against *A. indica* (SKE).

Fig-11 shows the values of per cent transformed feeding area by *H. armigera* larvae as a result of treatment with different plant extracts and their combinations with chemical pesticides.

As far as the plant extract treatment against *H. armigera* is concerned, highest value (97.2 per cent) was noted for *P. hysterophorus* (LE) whereas minimum (84 per cent) in case of *E. globulus* (LE), which indicated the preference for *P. hysterophorus* (LE) by the larvae (Fig-11A).
The data in Fig-11B indicated the maximum feeding area for *P. hysterophorus* (LE) (48.9 per cent) and minimum (29.9 per cent) for *A. indica* (SKE) in combination with monocrotophos against the larvae of *H. armigera*. Similar, trend in values of per cent transformed feeding area were obtained when plant extracts were used in combination with endosulfan. However, maximum values of 58.1 and minimum of 33.3 per cent were recorded for *P. hysterophorus* (LE) and *A. indica* (SKE), respectively (Fig-11C).

5. Insect Growth Regulatory (IGR) activities of plant extracts

The aqueous extracts (2 per cent) of ten plant species were tested to evaluate their effects on the growth and development of the chosen insect pests. The observations were made on the larval and pupal period wherein different parameters such as adult emergence, larval-pupal intermediate, pupal and adult deformities, fecundity and hatching of the eggs were taken into consideration. On the basis of the availability of the above data, per cent pupation, per cent adult emergence, per cent deformity and per cent hatching of eggs were computed. The results obtained for the above parameters are described separately for *S. litura* and *H. armigera*.

A) *S. litura*

i) Effect on growth and development

a) Larval period
The data on the larval development is shown in Table-24A. The perusal of table revealed that duration of larval development of *S. litura* on leaves treated with extract of *C. procera* (LE) and *A. sativum* (BE) was noted 17 days which was higher than the effect of other plant extracts as well as the control. When the larvae were fed on castor leaves treated with *A. indica* (LE) did not show neither increase nor decrease in the larval period as compared to control (Table-24A), however, the shortest larval period of 11.33 days was noted due to *A. conyzoides* (LE).

b) **Pupal period**

The data obtained for the change in the pupal period of *S. litura* when fed on castor leaves treated with aqueous extracts of different plants showed a range from 6.33 to 10.33 days (Table-24A). The longest pupal period of 10.33 days and the shortest of 6.33 days were noted against *P. hysterophorus* (LE) and *A. sativum* (BE) respectively as compared to control wherein it was 8.67 days.

c) **Per cent pupation**

As observed in Table-24A, the larvae were provided treated food with *D. alba* (FE) showed only 80 per cent pupation, which was the lowest recorded among all the plant extracts used. *A. indica* (LE), *A. conyzoides* (LE), *N. indicum* (LE) and *C. procera* (LE) did not show any
change in the per cent pupation that was insignificant with respect to control.

d) Adult emergence

The data on adult emergence in Table-24A showed the minimum emergence of adults of around 33.33 per cent was due to *A. indica* (SKE) treatment, whereas *A. conyzoides* (LE) supplement resulted in 80 per cent adult emergence that was the maximum, but lower than the control (93.33 per cent).

ii) Effect on deformities

The data on larval pupal intermediate, deformed adults and per cent total deformity in *S. litura* is shown in Table-24B.

a) Larval-pupal intermediate

The data presented showed the presence of larval-pupal intermediate in case of *A. indica* (SKE) treatment only (Table-24B) whereas in other treatment categories they were not found.

b) Deformed adults

At least three types of adult deformities were noticed due to the effect of different plant extracts which are as follows:

- Wings not fully developed or unscratched.
- Presence of wavy wings.
- Incomplete eclosion from pupae.

The deformities in adults of *S. litura* were noted against 2% concentrations of *A. indica* (SKE), *N. indicium* (LE) and *C. procera* (LE) (Table-24B).

c) **Per cent deformity**

The presented data showed maximum per cent total deformity due to the extract of *N. indicum* (LE) that was recorded 20 per cent (Table-24B). A value of 13.33 per cent total deformity was recorded for both the treatments of *A. indica* (SKE) and *C. procera* (LE).

iii) **Effect on fecundity, hatching and incubation of eggs**

The data on fecundity, hatching and incubation period of eggs of *S. litura* is shown in Table-24C.

a) **Fecundity**

The data showed that the adults emerged only from the pupae formed from the larvae which were fed on food treated with *E. globulus* (LE) and *A. sativum* (BE) (Table-24C). The number of egg per female moth observed in the treatment of *E. globulus* extract was 193.33 whereas with *A. sativum* (BE) it was recorded 189.33. In other treatment categories the adults did not laid eggs.
b) **Hatching of eggs**

The eggs counted from the female moth as a result of treatment with *A. sativum* (BE) showed 98.18 per cent hatching followed by *E. globulus* (LE) treatment for which 82.19 per cent hatching was recorded as compared to control where it was 99.67 per cent, respectively (Table-24C).

c) **Incubation period**

The incubation period recorded due to the treatments of *E. globulus* (LE) and *A. sativum* (BE) were 4.67 and 4.6, which was higher than the control in which it was 4.33 days, respectively.

**B) *H. armigera***

i) **Effect on growth and development**

a) **Larval period**

The data obtained on the larval development and growth is summarized in Table-25A. It followed a trend where due to the 2% concentration of *E. globulus* (LE), *A. indica* (LE) and *A. indica* (SKE) larval period increased to 19.33, 18.67 and 18.33 respectively. On the contrary, *D. alba* (FE), *N. indicum* (LE), *L. camara* (LE), *C. procera* (LE) and *A. sativum* (BE) caused the decrease in the larval period of the *H. armigera* with respect to control where it was recorded 17 days. The
minimum larval period of 14.33 days was recorded in case of *N. indicum* (LE) treated feed.

**b) Pupal period**

The evaluated data (Table-25A) represented a range of pupal period of *H. armigera* from 6-12.67 days when the larvae fed on castor leaves treated with aqueous extracts of various plant extracts. With respect to control, the longest duration of pupal period (12.67 days) was observed against the treatment of *E. globulus* (LE) while shortest (6 days) for *C. procera* (LE) supplemented diet.

**c) Per cent pupation**

The larvae reared on feed treated with *N. indicum* (LE), *P. hysterophorus* (LE), and *L. camara* (LE) resulted into cent per cent pupation like the same as recorded for control. In case of *A. indica* (LE), only 73.33 per cent pupation was recorded which was lowest amongst all the treatments and significantly different from the control group (*P*<0.05).

**d) Adult emergence**

The data on adult emergence in Table-25A showed that in case of *D. alba* (FE) no emergence of adults was found while on the other hand 90 per cent adult emergence was observed in control. The least per cent
emergence (13.33) was noticed when diet was treated with *A. indica* (SKE).

**ii) Effect on deformities**

The data on larval pupal intermediates, deformed adults and total per cent deformity is shown in Table-25B.

**a) Larval-pupal intermediate**

Except the treatment category of *A. indica* (LE), none of the treatments showed the existence of larval-pupal intermediates as observed in control for *H. armigera*.

**b) Deformed adults**

The deformities in adults of *H. armigera* were observed due to *A. indica* (SKE) and *A. indica* (LE) treatments, which were counted as 1 and 0.67. The other treatments did not show any deformity.

**c) Percent total deformity**

The data in Table-25B showed a total of 33.33 and 20 per cent deformities against *A. indica* (LE) and *A. indica* (SKE) treatments respectively, which were significantly higher as compared to control (*P<0.05*) as well as other treatments.
iii) Effect on fecundity, hatching and incubation of eggs

The data on fecundity, hatching and incubation period of eggs of *H. armigera* is shown in Table-25C.

a) **Fecundity**

The observations made on this parameter are given in Table-25C. The data showed that the adults emerged from the pupae of the larvae, which were fed on castor leaves treated with *P. hysterophorus* (LE) and *C. procera* (LE). The number of eggs per female moth observed due to the treatment of *P. hysterophorus* (LE) and *C. procera* (LE) were counted as 204.67 and 165.33, respectively with respect to control (240.8 eggs/female moth of *H. armigera*). On the contrary, eggs laying did not accomplished in the remaining treatment categories (Table-25C).

b) **Hatching of eggs**

In case of *P. hysterophorus* (LE) and *C. procera* (LE) per cent hatching was calculated as 94.66 and 64.57 respectively (Table-25C). However, no values were put on record for other treatments and the differences were highly significant with respect to control (*P*<0.05).

c) **Incubation period**

The values in Table-25C demonstrated that the treatment of castor leaves with 2% concentration of *P. hysterophorus* (LE) reduced the incubation period to 4 whereas *C. procera* (LE) treatment increased it to
4.67 days from 4.33 days as observed in controls. No values of incubation periods were observed in other treatment categories.
Table 1A. Insecticidal activity of some plant extracts against *Spodoptera litura* (larvae)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract</th>
<th>2% Mortality (Mean ± S.E.M)</th>
<th>4% Mortality (Mean ± S.E.M)</th>
<th>6% Mortality (Mean ± S.E.M)</th>
<th>8% Mortality (Mean ± S.E.M)</th>
<th>10% Mortality (Mean ± S.E.M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Azadirachta indica (SKE)</td>
<td>3.666 (±0.272)</td>
<td>14.666 (±0.272)</td>
<td>17.333 (±0.272)</td>
<td>21.333 (±0.272)</td>
<td>24.666 (±0.272)</td>
</tr>
<tr>
<td>2</td>
<td>Azadirachta indica (LE)</td>
<td>3.333 (±0.272)</td>
<td>13.333 (±0.544)</td>
<td>14.666 (±0.272)</td>
<td>18.666 (±0.272)</td>
<td>22.666 (±0.272)</td>
</tr>
<tr>
<td>3</td>
<td>Eucalyptus globulus (LE)</td>
<td>1.666 (±0.272)</td>
<td>6.666 (±0.471)</td>
<td>8.000 (±0.272)</td>
<td>10.666 (±0.272)</td>
<td>14.666 (±0.272)</td>
</tr>
<tr>
<td>4</td>
<td>Ageratum conyzoides (LE)</td>
<td>2.666 (±0.272)</td>
<td>10.666 (±0.272)</td>
<td>13.333 (±0.272)</td>
<td>17.333 (±0.272)</td>
<td>18.666 (±0.272)</td>
</tr>
<tr>
<td>5</td>
<td>Datura alba (FE)</td>
<td>2.333 (±0.272)</td>
<td>9.333 (±0.471)</td>
<td>12.000 (±0.272)</td>
<td>14.666 (±0.272)</td>
<td>17.333 (±0.272)</td>
</tr>
<tr>
<td>6</td>
<td>Nerium indicum (LE)</td>
<td>1.333 (±0.272)</td>
<td>5.333 (±0.471)</td>
<td>6.666 (±0.272)</td>
<td>9.333 (±0.272)</td>
<td>13.333 (±0.272)</td>
</tr>
<tr>
<td>7</td>
<td>Parthenium hysterophorus (LE)</td>
<td>1.000 (±0.272)</td>
<td>4.000 (±0.272)</td>
<td>5.333 (±0.272)</td>
<td>8.000 (±0.272)</td>
<td>10.666 (±0.272)</td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara (LE)</td>
<td>2.000 (±0.272)</td>
<td>8.000 (±0.471)</td>
<td>10.666 (±0.272)</td>
<td>14.666 (±0.272)</td>
<td>18.666 (±0.272)</td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera (LE)</td>
<td>2.666 (±0.272)</td>
<td>10.666 (±0.471)</td>
<td>13.333 (±0.272)</td>
<td>17.333 (±0.272)</td>
<td>21.333 (±0.272)</td>
</tr>
<tr>
<td>10</td>
<td>Allium sativum (BE)</td>
<td>1.333 (±0.272)</td>
<td>5.333 (±0.272)</td>
<td>6.666 (±0.272)</td>
<td>10.666 (±0.272)</td>
<td>14.666 (±0.272)</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000 (±0.000)</td>
<td>0.000 (±0.000)</td>
<td>0.000 (±0.000)</td>
<td>0.000 (±0.000)</td>
<td>0.000 (±0.000)</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water
Values in parentheses are standard error of mean (±S.E.M.)
% Mortality is Transformed % Mortality
Table 1B. Insecticidal activity of some plant extracts against *Spodoptera litura* (larvae)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract</th>
<th>2% (Mean ± S.E.M)</th>
<th>4% (Mean ± S.E.M)</th>
<th>6% (Mean ± S.E.M)</th>
<th>8% (Mean ± S.E.M)</th>
<th>10% (Mean ± S.E.M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>4.666 (±0.272)</td>
<td>18.666 (±0.544)</td>
<td>25.333 (±0.544)</td>
<td>29.333 (±0.272)</td>
<td>37.333 (±0.272)</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>3.666 (±0.272)</td>
<td>14.666 (±0.272)</td>
<td>21.333 (±0.272)</td>
<td>26.666 (±0.272)</td>
<td>34.666 (±0.816)</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>2.333 (±0.272)</td>
<td>9.333 (±0.471)</td>
<td>12.000 (±0.544)</td>
<td>17.333 (±0.272)</td>
<td>21.333 (±0.544)</td>
</tr>
<tr>
<td>4</td>
<td><em>Agaratum conyzoides</em> (LE)</td>
<td>3.666 (±0.272)</td>
<td>14.666 (±0.272)</td>
<td>17.333 (±0.272)</td>
<td>21.333 (±0.471)</td>
<td>28.000 (±0.720)</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>3.333 (±0.272)</td>
<td>13.333 (±0.272)</td>
<td>16.000 (±0.272)</td>
<td>22.666 (±0.471)</td>
<td>29.333 (±0.544)</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>2.333 (±0.272)</td>
<td>9.333 (±0.272)</td>
<td>10.666 (±0.272)</td>
<td>16.000 (±0.471)</td>
<td>20.000 (±0.816)</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>1.666 (±0.272)</td>
<td>6.666 (±0.272)</td>
<td>8.000 (±0.272)</td>
<td>3.333 (±0.544)</td>
<td>13.333 (±0.544)</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>3.333 (±0.272)</td>
<td>13.333 (±0.544)</td>
<td>14.666 (±0.544)</td>
<td>20.000 (±0.544)</td>
<td>25.333 (±0.544)</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>3.666 (±0.272)</td>
<td>14.666 (±0.272)</td>
<td>17.333 (±0.272)</td>
<td>21.333 (±0.272)</td>
<td>26.666 (±0.272)</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>2.000 (±0.471)</td>
<td>8.000 (±0.544)</td>
<td>10.666 (±0.471)</td>
<td>6.000 (±0.471)</td>
<td>24.000 (±0.544)</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000 (±0.272)</td>
<td>0.000 (±0.272)</td>
<td>1.333 (±0.272)</td>
<td>0.000 (±0.272)</td>
<td>0.000 (±0.272)</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE= fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality
Table 1C. Insecticidal activity of some plant extracts against *Spodoptera litura* (larvae)

Per cent Mortality at various concentrations after 72hrs

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract</th>
<th>2% Mortality</th>
<th>4% Mortality</th>
<th>6% Mortality</th>
<th>8% Mortality</th>
<th>10% Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean (± S.E.M.)</td>
<td>Mean (± S.E.M.)</td>
<td>Mean (± S.E.M.)</td>
<td>Mean (± S.E.M.)</td>
<td>Mean (± S.E.M.)</td>
</tr>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em></td>
<td>6.666 ± 0.720</td>
<td>7.666 ± 0.720</td>
<td>9.333 ± 0.272</td>
<td>10.333 ± 0.272</td>
<td>11.666 ± 0.272</td>
</tr>
<tr>
<td></td>
<td>(SKE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em></td>
<td>6.333 ± 0.272</td>
<td>7.666 ± 0.272</td>
<td>8.333 ± 0.272</td>
<td>9.333 ± 0.272</td>
<td>11.000 ± 0.471</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em></td>
<td>3.333 ± 0.272</td>
<td>4.333 ± 0.272</td>
<td>5.666 ± 0.272</td>
<td>6.666 ± 0.272</td>
<td>8.000 ± 0.471</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzaides</em></td>
<td>6.000 ± 0.471</td>
<td>6.666 ± 0.272</td>
<td>7.666 ± 0.272</td>
<td>9.000 ± 0.471</td>
<td>10.666 ± 0.272</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em></td>
<td>5.333 ± 0.544</td>
<td>6.333 ± 0.272</td>
<td>7.333 ± 0.272</td>
<td>8.666 ± 0.544</td>
<td>9.666 ± 0.544</td>
</tr>
<tr>
<td></td>
<td>(FE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em></td>
<td>3.000 ± 0.000</td>
<td>3.666 ± 0.272</td>
<td>5.333 ± 0.544</td>
<td>6.333 ± 0.544</td>
<td>7.333 ± 0.544</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em></td>
<td>2.333 ± 0.272</td>
<td>3.000 ± 0.471</td>
<td>3.666 ± 0.816</td>
<td>5.000 ± 0.544</td>
<td>6.333 ± 0.544</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em></td>
<td>4.666 ± 0.272</td>
<td>5.333 ± 0.272</td>
<td>6.666 ± 0.272</td>
<td>7.666 ± 0.272</td>
<td>8.666 ± 0.272</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em></td>
<td>5.000 ± 0.544</td>
<td>6.000 ± 0.720</td>
<td>7.333 ± 0.720</td>
<td>8.666 ± 0.720</td>
<td>9.666 ± 0.544</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em></td>
<td>3.000 ± 0.471</td>
<td>3.666 ± 0.544</td>
<td>5.333 ± 0.544</td>
<td>6.666 ± 0.544</td>
<td>8.000 ± 0.816</td>
</tr>
<tr>
<td></td>
<td>(BE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Control</td>
<td>0.000 ± 0.000</td>
<td>0.000 ± 0.000</td>
<td>0.000 ± 0.000</td>
<td>0.000 ± 0.272</td>
<td>0.666 ± 0.272</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE= fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality
Table 2A. Insecticidal activity of some plant extracts against *Helicoverpa armigera* (larvae)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract</th>
<th>2% Mean (± S.E.M)</th>
<th>2% % Mortality</th>
<th>4% Mean (± S.E.M)</th>
<th>4% % Mortality</th>
<th>6% Mean (± S.E.M)</th>
<th>6% % Mortality</th>
<th>8% Mean (± S.E.M)</th>
<th>8% % Mortality</th>
<th>10% Mean (± S.E.M)</th>
<th>10% % Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Acadirachta indica</em> (SKE)</td>
<td>3.00 (±0.000)</td>
<td>12.00</td>
<td>3.666 (±0.544)</td>
<td>14.666</td>
<td>3.666 (±0.272)</td>
<td>14.666</td>
<td>5.666 (±0.272)</td>
<td>22.666</td>
<td>8.666 (±0.544)</td>
<td>34.666</td>
</tr>
<tr>
<td>2</td>
<td><em>Acadirachta indica</em> (LE)</td>
<td>2.333 (±0.272)</td>
<td>9.333</td>
<td>2.666 (±0.272)</td>
<td>10.666</td>
<td>3.333 (±0.272)</td>
<td>13.333</td>
<td>4.333 (±0.272)</td>
<td>17.333</td>
<td>7.666 (±0.544)</td>
<td>30.666</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>1.333 (±0.272)</td>
<td>5.333</td>
<td>1.666 (±0.272)</td>
<td>6.666</td>
<td>2.333 (±0.272)</td>
<td>9.333</td>
<td>2.666 (±0.272)</td>
<td>10.666</td>
<td>4.333 (±0.272)</td>
<td>17.333</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>2.000 (±0.471)</td>
<td>8.000</td>
<td>2.333 (±0.272)</td>
<td>9.333</td>
<td>2.666 (±0.272)</td>
<td>10.666</td>
<td>3.333 (±0.544)</td>
<td>13.333</td>
<td>5.000 (±0.471)</td>
<td>20.000</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>1.666 (±0.272)</td>
<td>6.666</td>
<td>2.000 (±0.272)</td>
<td>8.000</td>
<td>2.666 (±0.272)</td>
<td>10.666</td>
<td>3.666 (±0.544)</td>
<td>14.666</td>
<td>5.000 (±0.471)</td>
<td>20.000</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>1.000 (±0.000)</td>
<td>4.000</td>
<td>1.333 (±0.272)</td>
<td>5.333</td>
<td>1.666 (±0.272)</td>
<td>6.666</td>
<td>2.333 (±0.272)</td>
<td>9.333</td>
<td>3.666 (±0.544)</td>
<td>14.666</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>0.666 (±0.272)</td>
<td>2.666</td>
<td>0.666 (±0.272)</td>
<td>2.666</td>
<td>1.333 (±0.272)</td>
<td>5.333</td>
<td>2.000 (±0.471)</td>
<td>8.000</td>
<td>2.666 (±0.544)</td>
<td>10.666</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>2.000 (±0.471)</td>
<td>8.000</td>
<td>2.333 (±0.272)</td>
<td>9.333</td>
<td>3.000 (±0.272)</td>
<td>12.000</td>
<td>3.666 (±0.471)</td>
<td>14.666</td>
<td>4.666 (±0.544)</td>
<td>18.666</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>1.666 (±0.544)</td>
<td>6.666</td>
<td>1.666 (±0.544)</td>
<td>6.666</td>
<td>2.333 (±0.272)</td>
<td>9.333</td>
<td>4.000 (±0.471)</td>
<td>16.000</td>
<td>5.333 (±0.272)</td>
<td>21.333</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>1.000 (±0.000)</td>
<td>4.000</td>
<td>1.333 (±0.272)</td>
<td>5.333</td>
<td>1.666 (±0.272)</td>
<td>6.666</td>
<td>2.333 (±0.544)</td>
<td>9.333</td>
<td>3.333 (±0.544)</td>
<td>13.333</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality
<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract</th>
<th>Per cent Mortality at various concentrations after 48 hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2% (± S.E.M)</td>
</tr>
<tr>
<td>1</td>
<td>Azadirachta indica (SKE)</td>
<td>4.666 (±0.272)</td>
</tr>
<tr>
<td>2</td>
<td>Azadirachta indica (LE)</td>
<td>4.000 (±0.471)</td>
</tr>
<tr>
<td>3</td>
<td>Eucalyptus globulus (LE)</td>
<td>2.333 (±0.272)</td>
</tr>
<tr>
<td>4</td>
<td>Agoratum conyzoides (LE)</td>
<td>3.333 (±0.272)</td>
</tr>
<tr>
<td>5</td>
<td>Datura alba (FE)</td>
<td>3.666 (±0.272)</td>
</tr>
<tr>
<td>6</td>
<td>Nerium indicum (LE)</td>
<td>2.333 (±0.272)</td>
</tr>
<tr>
<td>7</td>
<td>Parthenium hysterophorus (LE)</td>
<td>2.000 (±0.471)</td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara (LE)</td>
<td>3.666 (±0.272)</td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera (LE)</td>
<td>3.666 (±0.272)</td>
</tr>
<tr>
<td>10</td>
<td>Allium sativum (BE)</td>
<td>2.333 (±0.272)</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000 (±0.000)</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality
Table 2C. Insecticidal activity of some plant extracts against *Helicoverpa armigera* (larvae)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract</th>
<th>2% Mortality (Mean ± S.E.M.)</th>
<th>4% Mortality (Mean ± S.E.M.)</th>
<th>6% Mortality (Mean ± S.E.M.)</th>
<th>8% Mortality (Mean ± S.E.M.)</th>
<th>10% Mortality (Mean ± S.E.M.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>6.666 (+0.272)</td>
<td>26.666</td>
<td>7.333 (+0.544)</td>
<td>29.333</td>
<td>8.666 (+0.544)</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>6.000 (+0.272)</td>
<td>24.000</td>
<td>6.666 (+0.272)</td>
<td>26.666</td>
<td>8.000 (+0.272)</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>4.000 (+0.000)</td>
<td>16.000</td>
<td>4.666 (+0.272)</td>
<td>18.666</td>
<td>6.000 (+0.471)</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>5.666 (+0.272)</td>
<td>22.666</td>
<td>6.333 (+0.272)</td>
<td>25.333</td>
<td>7.333 (+0.272)</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>5.666 (+0.272)</td>
<td>22.666</td>
<td>6.666 (+0.272)</td>
<td>26.666</td>
<td>7.666 (+0.720)</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>4.000 (+0.272)</td>
<td>16.000</td>
<td>4.333 (+0.272)</td>
<td>17.333</td>
<td>5.333 (+0.544)</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>3.000 (+0.471)</td>
<td>12.000</td>
<td>3.666 (+0.272)</td>
<td>14.666</td>
<td>4.666 (+0.544)</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>5.333 (+0.272)</td>
<td>21.333</td>
<td>6.333 (+0.720)</td>
<td>25.333</td>
<td>7.333 (+0.544)</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>5.666 (+0.544)</td>
<td>22.666</td>
<td>6.666 (+0.544)</td>
<td>26.666</td>
<td>7.666 (+0.544)</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>3.666 (+0.272)</td>
<td>14.666</td>
<td>4.333 (+0.272)</td>
<td>17.333</td>
<td>5.333 (+0.272)</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000 (0.000)</td>
<td>0.000 (0.000)</td>
<td>0.000 (0.000)</td>
<td>0.000 (0.000)</td>
<td>0.000 (0.000)</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality
Table 3A. Summary of statistical calculations for mortality response of *Spodoptera litura* (larvae) on treatment with different plant extracts

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract</th>
<th>Regression equation &amp; its analysis</th>
<th>LC₅₀</th>
<th>Relative Ratio</th>
<th>Order of Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>y=5.4x+13.6; m=2.70; b=13.60; r²=0.956</td>
<td></td>
<td>0.0336</td>
<td>0.521</td>
</tr>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td></td>
<td></td>
<td>0.0346</td>
<td>0.537</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td></td>
<td></td>
<td>0.0488</td>
<td>0.756</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td></td>
<td></td>
<td>0.0357</td>
<td>0.553</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td></td>
<td></td>
<td>0.0394</td>
<td>0.610</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td></td>
<td></td>
<td>0.0595</td>
<td>0.921</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td></td>
<td></td>
<td>0.0645</td>
<td>1.000</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td></td>
<td></td>
<td>0.0405</td>
<td>0.628</td>
</tr>
<tr>
<td>9</td>
<td><em>Callotropis procera</em> (LE)</td>
<td></td>
<td></td>
<td>0.0341</td>
<td>0.538</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td></td>
<td></td>
<td>0.0485</td>
<td>0.752</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract

m = slope, b = intercept, r² = determinant coefficient
Table 3B. Summary of statistical calculations for mortality response of *Helicoverpa armigera* (larvae) on treatment with different plant extracts

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract</th>
<th>Regression equation &amp; its analysis</th>
<th>LC$_{50}$</th>
<th>Relative Ratio</th>
<th>Order of Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$y$</td>
<td>$m$</td>
<td>$b$</td>
<td>$r^2$</td>
</tr>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em></td>
<td>$5.2x + 12.2$</td>
<td>2.60</td>
<td>12.20</td>
<td>0.958</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em></td>
<td>$5.1x + 9.3$</td>
<td>2.25</td>
<td>9.30</td>
<td>0.967</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em></td>
<td>$3.8x + 5.4$</td>
<td>1.90</td>
<td>5.40</td>
<td>0.978</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em></td>
<td>$4.1x + 9.1$</td>
<td>2.05</td>
<td>9.10</td>
<td>0.959</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em></td>
<td>$3.8x + 10.2$</td>
<td>1.90</td>
<td>10.20</td>
<td>0.954</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em></td>
<td>$3.6x + 4.8$</td>
<td>1.80</td>
<td>4.80</td>
<td>0.975</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em></td>
<td>$3.2x + 3.6$</td>
<td>1.60</td>
<td>3.60</td>
<td>0.980</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em></td>
<td>$3.5x + 10.7$</td>
<td>1.75</td>
<td>10.70</td>
<td>0.947</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em></td>
<td>$4.1x + 9.7$</td>
<td>2.05</td>
<td>9.70</td>
<td>0.959</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em></td>
<td>$4.3x + 3.3$</td>
<td>2.15</td>
<td>3.30</td>
<td>0.988</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE= fruit extract, BE=bulb extract

$m =$ slope, $b =$ intercept, $r^2 =$ determinant coefficient
Table 4. Insecticidal activity of some pesticides against the (larvae) of \textit{Spodoptera litura} and \textit{Helicoverpa armigera}

<table>
<thead>
<tr>
<th>Name of the insects</th>
<th>Name of the Insecticides (%Conc.) w/v</th>
<th>24 hrs</th>
<th>48 hrs</th>
<th>72 hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean (± S.E.M)</td>
<td>% Mortality</td>
<td>Mean (± S.E.M)</td>
</tr>
<tr>
<td>1. \textit{Spodoptera litura}</td>
<td>(a) Monocrotophos (0.04%)</td>
<td>14.666</td>
<td>58.666</td>
<td>16.000</td>
</tr>
<tr>
<td></td>
<td>(b) Endosulfan (0.07%)</td>
<td>14.333</td>
<td>57.333</td>
<td>16.666</td>
</tr>
<tr>
<td></td>
<td>(c) Control (DDW)</td>
<td>0.000</td>
<td>0.000</td>
<td>0.333</td>
</tr>
<tr>
<td>2. \textit{Helicoverpa armigera}</td>
<td>(a) Monocrotophos (0.04%)</td>
<td>12.666</td>
<td>50.666</td>
<td>15.000</td>
</tr>
<tr>
<td></td>
<td>(b) Endosulfan (0.07%)</td>
<td>13.333</td>
<td>53.333</td>
<td>15.666</td>
</tr>
<tr>
<td></td>
<td>(c) Control (DDW)</td>
<td>0.000</td>
<td>0.000</td>
<td>0.333</td>
</tr>
</tbody>
</table>

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality

Where, DDW=distilled water
Table 5A. Insecticidal activity of some plant extracts in combination with Monocrotophos against *Spodoptera litura* (larvae)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Monocrotophos (0.02%)</th>
<th>1%</th>
<th>2%</th>
<th>3%</th>
<th>4%</th>
<th>5%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (% Mortality) (± S.E.M)</td>
<td>Mean (% Mortality) (± S.E.M)</td>
<td>Mean (% Mortality) (± S.E.M)</td>
<td>Mean (% Mortality) (± S.E.M)</td>
<td>Mean (% Mortality) (± S.E.M)</td>
<td>Mean (% Mortality) (± S.E.M)</td>
</tr>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>7.000 ± 0.471</td>
<td>8.666 ± 0.272</td>
<td>9.666 ± 0.272</td>
<td>11.666 ± 0.720</td>
<td>12.666 ± 0.544</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>6.333 ± 0.720</td>
<td>7.666 ± 0.544</td>
<td>8.333 ± 0.272</td>
<td>11.333 ± 1.272</td>
<td>12.333 ± 0.272</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>5.333 ± 0.272</td>
<td>7.333 ± 0.272</td>
<td>7.666 ± 0.272</td>
<td>9.333 ± 0.544</td>
<td>11.333 ± 0.544</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>6.000 ± 0.471</td>
<td>7.333 ± 0.272</td>
<td>7.333 ± 0.272</td>
<td>10.000 ± 0.471</td>
<td>10.666 ± 0.981</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>5.666 ± 0.272</td>
<td>6.666 ± 0.544</td>
<td>7.000 ± 0.816</td>
<td>9.666 ± 0.471</td>
<td>10.333 ± 1.544</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>4.333 ± 0.720</td>
<td>5.666 ± 0.544</td>
<td>7.000 ± 0.471</td>
<td>8.333 ± 0.544</td>
<td>10.000 ± 0.816</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>4.333 ± 0.272</td>
<td>5.666 ± 0.272</td>
<td>7.000 ± 0.544</td>
<td>8.333 ± 0.981</td>
<td>9.666 ± 0.720</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>5.666 ± 0.272</td>
<td>7.000 ± 0.471</td>
<td>7.333 ± 0.720</td>
<td>10.666 ± 0.720</td>
<td>11.666 ± 0.720</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>5.000 ± 0.471</td>
<td>6.000 ± 0.186</td>
<td>7.333 ± 0.471</td>
<td>11.000 ± 0.471</td>
<td>11.333 ± 0.544</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>3.666 ± 0.272</td>
<td>4.666 ± 0.544</td>
<td>6.000 ± 0.272</td>
<td>7.000 ± 0.816</td>
<td>9.333 ± 0.720</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000 ± 0.000</td>
<td>0.000 ± 0.000</td>
<td>0.000 ± 0.000</td>
<td>0.000 ± 0.000</td>
<td>0.333 ± 0.272</td>
</tr>
</tbody>
</table>

Where, SKE = seed kernel extract, LE = leaf extract, FE = fruit extract, BE = bulb extract, DDW = distilled water
Values in parentheses are standard error of mean (± S.E.M.)
% Mortality is Transformed % Mortality
Table 5B. Insecticidal activity of some plant extracts in combination with Monocrotophos against *Spodoptera litura* (larvae)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Monocrotophos (0.02%)</th>
<th>1% Mean (± S.E.M)</th>
<th>1% % Mortality</th>
<th>2% Mean (± S.E.M)</th>
<th>2% % Mortality</th>
<th>3% Mean (± S.E.M)</th>
<th>3% % Mortality</th>
<th>4% Mean (± S.E.M)</th>
<th>4% % Mortality</th>
<th>5% Mean (± S.E.M)</th>
<th>5% % Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Azadirachta indica (SKE)</td>
<td>8.000</td>
<td>32.000</td>
<td>9.666</td>
<td>38.666</td>
<td>11.666</td>
<td>46.666</td>
<td>13.666</td>
<td>54.666</td>
<td>14.666</td>
<td>58.666</td>
</tr>
<tr>
<td>2</td>
<td>Azadirachta indica (LE)</td>
<td>7.333</td>
<td>28.000</td>
<td>8.666</td>
<td>34.666</td>
<td>10.666</td>
<td>42.666</td>
<td>12.666</td>
<td>50.666</td>
<td>14.333</td>
<td>57.333</td>
</tr>
<tr>
<td>4</td>
<td>Ageratum conyzoides (LE)</td>
<td>6.666</td>
<td>26.666</td>
<td>8.333</td>
<td>33.333</td>
<td>10.000</td>
<td>40.000</td>
<td>10.666</td>
<td>42.666</td>
<td>11.333</td>
<td>45.333</td>
</tr>
<tr>
<td>5</td>
<td>Datura alba (FE)</td>
<td>6.666</td>
<td>26.666</td>
<td>8.000</td>
<td>32.000</td>
<td>9.000</td>
<td>36.000</td>
<td>10.666</td>
<td>42.666</td>
<td>11.000</td>
<td>44.000</td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara (LE)</td>
<td>7.000</td>
<td>28.000</td>
<td>9.000</td>
<td>36.000</td>
<td>10.666</td>
<td>42.666</td>
<td>11.666</td>
<td>46.666</td>
<td>12.666</td>
<td>50.666</td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera (LE)</td>
<td>6.666</td>
<td>26.666</td>
<td>7.666</td>
<td>30.666</td>
<td>9.666</td>
<td>38.666</td>
<td>11.000</td>
<td>44.000</td>
<td>12.333</td>
<td>49.333</td>
</tr>
<tr>
<td>10</td>
<td>Allium sativum (BE)</td>
<td>4.666</td>
<td>18.666</td>
<td>6.000</td>
<td>24.000</td>
<td>7.666</td>
<td>30.666</td>
<td>9.333</td>
<td>37.333</td>
<td>11.000</td>
<td>44.000</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000</td>
<td>0.000</td>
<td>0.333</td>
<td>1.333</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.333</td>
<td>1.333</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality
Table 5C. Insecticidal activity of some plant extracts in combination with Monocrotophos against *Spodoptera litura* (larvae)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Monocrotophos (0.02%)</th>
<th>Mean 1% (± S.E.M)</th>
<th>% Mortality</th>
<th>Mean 2% (± S.E.M)</th>
<th>% Mortality</th>
<th>Mean 3% (± S.E.M)</th>
<th>% Mortality</th>
<th>Mean 4% (± S.E.M)</th>
<th>% Mortality</th>
<th>Mean 5% (± S.E.M)</th>
<th>% Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Azadirachta indica (SKE)</td>
<td>9.666</td>
<td>38.666</td>
<td>11.333</td>
<td>45.333</td>
<td>13.666</td>
<td>54.666</td>
<td>14.666</td>
<td>58.666</td>
<td>16.000</td>
<td>64.000</td>
</tr>
<tr>
<td>3</td>
<td>Eucalyptus globulus (LE)</td>
<td>7.000</td>
<td>28.000</td>
<td>9.000</td>
<td>36.000</td>
<td>10.666</td>
<td>42.666</td>
<td>11.666</td>
<td>46.666</td>
<td>13.666</td>
<td>54.666</td>
</tr>
<tr>
<td>4</td>
<td>Ageratum conyzoides (LE)</td>
<td>7.666</td>
<td>30.666</td>
<td>8.666</td>
<td>34.666</td>
<td>10.333</td>
<td>41.333</td>
<td>11.666</td>
<td>46.666</td>
<td>13.333</td>
<td>53.333</td>
</tr>
<tr>
<td>5</td>
<td>Datura alba (FE)</td>
<td>7.000</td>
<td>28.000</td>
<td>8.333</td>
<td>33.333</td>
<td>10.666</td>
<td>42.666</td>
<td>12.000</td>
<td>48.000</td>
<td>13.000</td>
<td>52.000</td>
</tr>
<tr>
<td>6</td>
<td>Nerium indicum (LE)</td>
<td>6.000</td>
<td>24.000</td>
<td>8.000</td>
<td>32.000</td>
<td>9.000</td>
<td>36.000</td>
<td>10.666</td>
<td>42.666</td>
<td>12.333</td>
<td>49.333</td>
</tr>
<tr>
<td>7</td>
<td>Parthenium hysterophorus (LE)</td>
<td>5.666</td>
<td>22.666</td>
<td>7.666</td>
<td>30.666</td>
<td>9.000</td>
<td>36.000</td>
<td>10.333</td>
<td>41.333</td>
<td>11.666</td>
<td>46.666</td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara (LE)</td>
<td>8.666</td>
<td>34.666</td>
<td>10.666</td>
<td>42.666</td>
<td>11.333</td>
<td>45.333</td>
<td>12.000</td>
<td>48.000</td>
<td>13.666</td>
<td>54.666</td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera (LE)</td>
<td>7.666</td>
<td>30.666</td>
<td>9.333</td>
<td>37.333</td>
<td>11.000</td>
<td>44.000</td>
<td>11.666</td>
<td>46.666</td>
<td>14.666</td>
<td>58.666</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.333</td>
<td>1.333</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>2.666</td>
<td>0.333</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE= fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality.
Table 6A. Insecticidal activity of some plant extracts in combination with Monocrotophos against *Helicoverpa armigera* (larvae)

Per cent Mortality at various concentrations after 24hrs

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Monocrotophos (0.02%)</th>
<th>1% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>2% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>3% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>4% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>5% Mean (± S.E.M)</th>
<th>% Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>4.666</td>
<td>18.666</td>
<td>5.333</td>
<td>21.333</td>
<td>7.666</td>
<td>30.666</td>
<td>11.333</td>
<td>45.333</td>
<td>12.000</td>
<td>48.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(±0.272)</td>
<td></td>
<td>(±0.544)</td>
<td></td>
<td>(±0.272)</td>
<td></td>
<td>(±0.544)</td>
<td></td>
<td>(±0.471)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(±0.544)</td>
<td></td>
<td>(±0.720)</td>
<td></td>
<td>(±0.720)</td>
<td></td>
<td>(±0.544)</td>
<td></td>
<td>(±0.720)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>2.000</td>
<td>8.000</td>
<td>2.666</td>
<td>10.666</td>
<td>4.666</td>
<td>18.666</td>
<td>6.666</td>
<td>26.666</td>
<td>7.666</td>
<td>30.666</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(±0.000)</td>
<td></td>
<td>(±0.272)</td>
<td></td>
<td>(±0.272)</td>
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<td>(±0.272)</td>
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<td>(±0.544)</td>
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<td></td>
<td>(±0.544)</td>
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</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>3.333</td>
<td>13.333</td>
<td>4.333</td>
<td>17.333</td>
<td>6.000</td>
<td>24.000</td>
<td>8.333</td>
<td>33.333</td>
<td>10.666</td>
<td>42.666</td>
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<td>(±0.272)</td>
<td></td>
<td>(±0.471)</td>
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<td>(±0.544)</td>
<td></td>
<td>(±0.272)</td>
<td></td>
<td>(±0.544)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>3.333</td>
<td>13.333</td>
<td>4.000</td>
<td>16.000</td>
<td>5.333</td>
<td>21.333</td>
<td>8.000</td>
<td>32.000</td>
<td>8.333</td>
<td>33.333</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(±0.544)</td>
<td></td>
<td>(±0.720)</td>
<td></td>
<td>(±0.816)</td>
<td></td>
<td>(±0.471)</td>
<td></td>
<td>(±0.272)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>1.666</td>
<td>6.666</td>
<td>2.666</td>
<td>10.666</td>
<td>4.000</td>
<td>16.000</td>
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<td>(±0.272)</td>
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<td>(±0.272)</td>
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<td>(±0.816)</td>
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<td>(±0.272)</td>
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<td>(±0.272)</td>
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<td>(±0.272)</td>
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<td>(±0.272)</td>
<td></td>
<td>(±0.272)</td>
<td></td>
<td>(±0.720)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>3.666</td>
<td>14.666</td>
<td>4.333</td>
<td>17.333</td>
<td>5.666</td>
<td>22.666</td>
<td>8.333</td>
<td>33.333</td>
<td>10.000</td>
<td>40.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(±0.544)</td>
<td></td>
<td>(±0.272)</td>
<td></td>
<td>(±0.720)</td>
<td></td>
<td>(±0.816)</td>
<td></td>
<td>(±0.272)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>3.000</td>
<td>12.000</td>
<td>3.666</td>
<td>14.666</td>
<td>4.333</td>
<td>17.333</td>
<td>7.333</td>
<td>29.333</td>
<td>8.000</td>
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<td>(±0.000)</td>
<td></td>
<td>(±0.272)</td>
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<td>(±0.272)</td>
<td></td>
<td>(±0.272)</td>
<td></td>
<td>(±0.471)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE= fruit extract, BE=bulb extract, DDW=distilled water.

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality.
Table 6B. Insecticidal activity of some plant extracts in combination with Monocrotrophos against *Helicoverpa armigera* (larvae)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Monocrotrophos (0.02%)</th>
<th>1% Mean (% Mortality ± S.E.M.)</th>
<th>2% Mean (% Mortality ± S.E.M.)</th>
<th>3% Mean (% Mortality ± S.E.M.)</th>
<th>4% Mean (% Mortality ± S.E.M.)</th>
<th>5% Mean (% Mortality ± S.E.M.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Azadirachta indica (SKE)</td>
<td>7.000 (±0.027) 28.000</td>
<td>8.666 (±0.027) 34.666</td>
<td>11.333 (±0.027) 45.333</td>
<td>13.333 (±0.027) 53.333</td>
<td>14.333 (±0.027) 57.333</td>
</tr>
<tr>
<td>2</td>
<td>Azadirachta indica (LE)</td>
<td>6.666 (±0.027) 26.666</td>
<td>8.333 (±0.027) 33.333</td>
<td>9.000 (±0.027) 36.000</td>
<td>11.666 (±0.027) 46.666</td>
<td>13.333 (±0.027) 53.333</td>
</tr>
<tr>
<td>3</td>
<td>Eucalyptus globulus (LE)</td>
<td>4.000 (±0.0471) 16.000</td>
<td>5.333 (±0.0471) 21.333</td>
<td>6.666 (±0.027) 26.666</td>
<td>8.333 (±0.027) 33.333</td>
<td>10.000 (±0.027) 40.000</td>
</tr>
<tr>
<td>4</td>
<td>Ageratum conyzoides (LE)</td>
<td>5.666 (±0.0272) 22.666</td>
<td>7.666 (±0.0272) 30.666</td>
<td>8.333 (±0.0272) 33.333</td>
<td>10.666 (±0.0272) 42.666</td>
<td>12.666 (±0.0272) 50.666</td>
</tr>
<tr>
<td>5</td>
<td>Datura alba (FE)</td>
<td>5.666 (±0.0272) 22.666</td>
<td>7.000 (±0.0272) 28.000</td>
<td>8.333 (±0.0272) 34.666</td>
<td>10.666 (±0.0272) 42.666</td>
<td>12.666 (±0.0272) 50.666</td>
</tr>
<tr>
<td>6</td>
<td>Nerium indicum (LE)</td>
<td>4.666 (±0.0272) 18.666</td>
<td>6.333 (±0.0272) 25.333</td>
<td>7.000 (±0.0272) 28.000</td>
<td>8.333 (±0.0272) 33.333</td>
<td>11.000 (±0.0272) 44.000</td>
</tr>
<tr>
<td>7</td>
<td>Parthenium hysterophorus (LE)</td>
<td>3.333 (±0.0272) 13.333</td>
<td>4.000 (±0.0272) 16.000</td>
<td>5.666 (±0.0272) 22.666</td>
<td>7.000 (±0.0272) 28.000</td>
<td>9.333 (±0.0272) 37.333</td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara (LE)</td>
<td>5.666 (±0.0272) 22.666</td>
<td>7.333 (±0.0272) 29.333</td>
<td>9.000 (±0.0272) 36.000</td>
<td>11.000 (±0.0272) 44.000</td>
<td>12.000 (±0.0272) 48.000</td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera (LE)</td>
<td>4.000 (±0.0272) 16.000</td>
<td>4.666 (±0.0272) 18.666</td>
<td>7.333 (±0.0272) 29.333</td>
<td>9.333 (±0.0272) 37.333</td>
<td>11.333 (±0.0272) 45.333</td>
</tr>
<tr>
<td>10</td>
<td>Allium sativum (BE)</td>
<td>4.333 (±0.0272) 17.333</td>
<td>6.000 (±0.0272) 24.000</td>
<td>6.333 (±0.0272) 25.333</td>
<td>6.666 (±0.0272) 26.666</td>
<td>9.333 (±0.0272) 37.333</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.333 (±0.0272) 1.333</td>
<td>0.333 (±0.0272) 1.333</td>
<td>0.000 (±0.0272) 0.000</td>
<td>0.000 (±0.0272) 0.000</td>
<td>0.333 (±0.0272) 1.333</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality
<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Monocrotrophos (0.02%)</th>
<th>1% Mean (± S.E.M)</th>
<th>1% % Mortality</th>
<th>2% Mean (± S.E.M)</th>
<th>2% % Mortality</th>
<th>3% Mean (± S.E.M)</th>
<th>3% % Mortality</th>
<th>4% Mean (± S.E.M)</th>
<th>4% % Mortality</th>
<th>5% Mean (± S.E.M)</th>
<th>5% % Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>10.666</td>
<td>42.666</td>
<td>12.000</td>
<td>48.000</td>
<td>13.333</td>
<td>53.333</td>
<td>13.666</td>
<td>54.666</td>
<td>15.666</td>
<td>62.666</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>5.000</td>
<td>20.000</td>
<td>6.000</td>
<td>24.000</td>
<td>7.000</td>
<td>28.000</td>
<td>8.000</td>
<td>32.000</td>
<td>9.000</td>
<td>36.000</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>7.333</td>
<td>29.333</td>
<td>9.333</td>
<td>37.333</td>
<td>10.333</td>
<td>41.333</td>
<td>11.000</td>
<td>44.000</td>
<td>12.000</td>
<td>48.000</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>7.666</td>
<td>30.666</td>
<td>9.666</td>
<td>38.666</td>
<td>10.666</td>
<td>42.666</td>
<td>12.000</td>
<td>48.000</td>
<td>13.666</td>
<td>54.666</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>6.666</td>
<td>26.666</td>
<td>8.666</td>
<td>34.666</td>
<td>9.333</td>
<td>37.333</td>
<td>10.666</td>
<td>42.666</td>
<td>11.666</td>
<td>46.666</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>6.666</td>
<td>26.666</td>
<td>8.333</td>
<td>33.333</td>
<td>10.666</td>
<td>42.666</td>
<td>13.666</td>
<td>54.666</td>
<td>15.000</td>
<td>60.000</td>
</tr>
<tr>
<td>11</td>
<td><em>Control</em> (DDW)</td>
<td>0.333</td>
<td>1.333</td>
<td>0.333</td>
<td>1.333</td>
<td>0.333</td>
<td>1.333</td>
<td>0.000</td>
<td>0.000</td>
<td>0.666</td>
<td>2.666</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water.

Values in parentheses are standard error of mean (±S.E.M).

% Mortality is Transformed % Mortality.
Table 7A. Insecticidal activity of some plant extracts in combination with Endosulfan against *Spodoptera litura* (larvae)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Endosulfan (0.035%)</th>
<th>1% Mean (± S.E.M.)</th>
<th>% Mortality</th>
<th>2% Mean (± S.E.M.)</th>
<th>% Mortality</th>
<th>3% Mean (± S.E.M.)</th>
<th>% Mortality</th>
<th>4% Mean (± S.E.M.)</th>
<th>% Mortality</th>
<th>5% Mean (± S.E.M.)</th>
<th>% Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>7.666 (±0.544)</td>
<td>30.666</td>
<td>9.333 (±0.272)</td>
<td>37.333</td>
<td>11.666 (±0.544)</td>
<td>46.666</td>
<td>12.333 (±0.720)</td>
<td>49.333</td>
<td>13.333 (±0.272)</td>
<td>53.333</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>6.666 (±0.544)</td>
<td>26.666</td>
<td>8.333 (±0.272)</td>
<td>33.333</td>
<td>10.666 (±0.544)</td>
<td>42.666</td>
<td>11.666 (±0.272)</td>
<td>46.666</td>
<td>12.666 (±0.544)</td>
<td>50.666</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>6.333 (±0.272)</td>
<td>25.333</td>
<td>8.000 (±0.000)</td>
<td>32.000</td>
<td>9.666 (±0.544)</td>
<td>38.666</td>
<td>10.666 (±0.981)</td>
<td>42.666</td>
<td>11.666 (±0.544)</td>
<td>46.666</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>5.666 (±0.272)</td>
<td>22.666</td>
<td>7.666 (±0.272)</td>
<td>30.666</td>
<td>10.666 (±0.720)</td>
<td>42.666</td>
<td>11.333 (±0.544)</td>
<td>45.333</td>
<td>12.333 (±0.544)</td>
<td>49.333</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>6.333 (±0.544)</td>
<td>25.333</td>
<td>8.333 (±0.544)</td>
<td>33.333</td>
<td>10.000 (±0.816)</td>
<td>40.000</td>
<td>11.333 (±0.272)</td>
<td>45.333</td>
<td>12.333 (±0.544)</td>
<td>49.333</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>3.666 (±0.272)</td>
<td>14.666</td>
<td>6.333 (±0.272)</td>
<td>25.333</td>
<td>8.333 (±0.544)</td>
<td>33.333</td>
<td>10.666 (±0.544)</td>
<td>42.666</td>
<td>12.000 (±0.816)</td>
<td>48.000</td>
</tr>
<tr>
<td>7</td>
<td><em>Euphorion hysterophorus</em> (LE)</td>
<td>3.333 (±0.272)</td>
<td>13.333</td>
<td>5.666 (±0.544)</td>
<td>22.666</td>
<td>7.666 (±0.544)</td>
<td>30.666</td>
<td>9.333 (±0.272)</td>
<td>37.333</td>
<td>11.000 (±0.942)</td>
<td>44.000</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>5.666 (±0.272)</td>
<td>22.666</td>
<td>7.666 (±0.272)</td>
<td>30.666</td>
<td>9.666 (±0.544)</td>
<td>38.666</td>
<td>11.333 (±0.981)</td>
<td>45.333</td>
<td>12.333 (±0.720)</td>
<td>49.333</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>4.666 (±0.272)</td>
<td>18.666</td>
<td>6.666 (±0.272)</td>
<td>26.666</td>
<td>8.666 (±0.544)</td>
<td>34.666</td>
<td>10.333 (±0.272)</td>
<td>41.333</td>
<td>12.000 (±0.471)</td>
<td>48.000</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>4.333 (±0.272)</td>
<td>17.333</td>
<td>6.000 (±0.000)</td>
<td>24.000</td>
<td>8.333 (±0.272)</td>
<td>33.333</td>
<td>8.666 (±0.471)</td>
<td>34.666</td>
<td>10.000 (±0.471)</td>
<td>40.000</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality
Table 7B. Insecticidal activity of some plant extracts in combination with Endosulfan against Spodoptera litura (larvae)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Plant extract</th>
<th>1% Mortality (± S.E.M.)</th>
<th>2% Mortality (± S.E.M.)</th>
<th>3% Mortality (± S.E.M.)</th>
<th>4% Mortality (± S.E.M.)</th>
<th>5% Mortality (± S.E.M.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Acacia indica (SKE)</td>
<td>7.666 (±0.544)</td>
<td>30.666 (±0.272)</td>
<td>37.333 (±0.272)</td>
<td>46.666 (±0.544)</td>
<td>12.333 (±0.272)</td>
</tr>
<tr>
<td>2</td>
<td>Acacia indica (LE)</td>
<td>6.666 (±0.544)</td>
<td>26.666 (±0.272)</td>
<td>8.333 (±0.272)</td>
<td>10.666 (±0.272)</td>
<td>42.666 (±0.272)</td>
</tr>
<tr>
<td>3</td>
<td>Eucalyptus globulus (LE)</td>
<td>6.333 (±0.272)</td>
<td>25.333 (±0.272)</td>
<td>8.000 (±0.272)</td>
<td>9.666 (±0.272)</td>
<td>38.666 (±0.272)</td>
</tr>
<tr>
<td>4</td>
<td>Ageratum conyzoides (LE)</td>
<td>5.666 (±0.272)</td>
<td>22.666 (±0.272)</td>
<td>7.666 (±0.272)</td>
<td>30.666 (±0.272)</td>
<td>42.666 (±0.272)</td>
</tr>
<tr>
<td>5</td>
<td>Datura alba (FE)</td>
<td>6.333 (±0.544)</td>
<td>25.333 (±0.544)</td>
<td>8.333 (±0.544)</td>
<td>10.000 (±0.816)</td>
<td>40.000 (±0.272)</td>
</tr>
<tr>
<td>6</td>
<td>Nerium indicum (LE)</td>
<td>3.666 (±0.272)</td>
<td>14.666 (±0.272)</td>
<td>6.333 (±0.272)</td>
<td>25.333 (±0.272)</td>
<td>8.333 (±0.272)</td>
</tr>
<tr>
<td>7</td>
<td>Parthenium hysterophorus (LE)</td>
<td>3.333 (±0.272)</td>
<td>13.333 (±0.272)</td>
<td>5.666 (±0.272)</td>
<td>22.666 (±0.272)</td>
<td>7.666 (±0.272)</td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara (LE)</td>
<td>5.666 (±0.272)</td>
<td>22.666 (±0.272)</td>
<td>7.666 (±0.272)</td>
<td>30.666 (±0.272)</td>
<td>9.666 (±0.272)</td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera (LE)</td>
<td>4.666 (±0.272)</td>
<td>18.666 (±0.272)</td>
<td>6.666 (±0.272)</td>
<td>26.666 (±0.272)</td>
<td>8.666 (±0.272)</td>
</tr>
<tr>
<td>10</td>
<td>Allium sativum (BE)</td>
<td>4.333 (±0.272)</td>
<td>17.333 (±0.272)</td>
<td>6.000 (±0.272)</td>
<td>24.000 (±0.272)</td>
<td>8.333 (±0.272)</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000 (±0.000)</td>
<td>0.000 (±0.000)</td>
<td>0.000 (±0.000)</td>
<td>0.000 (±0.000)</td>
<td>0.000 (±0.000)</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water
Values in parentheses are standard error of mean (±S.E.M.)
% Mortality is Transformed % Mortality
Table 7C. Insecticidal activity of some plant extracts in combination with Endosulfan against *Spodoptera litura* (larvae)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Endosulfan (0.035%)</th>
<th>1% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>2% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>3% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>4% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>5% Mean (± S.E.M)</th>
<th>% Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>9.333 (±0.272)</td>
<td>37.333</td>
<td>11.333 (±0.272)</td>
<td>45.333</td>
<td>13.666 (±0.272)</td>
<td>54.666</td>
<td>15.333 (±0.272)</td>
<td>61.333</td>
<td>17.666 (±0.544)</td>
<td>70.666</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>8.666 (±0.544)</td>
<td>34.666</td>
<td>10.333 (±0.544)</td>
<td>41.333</td>
<td>12.666 (±0.720)</td>
<td>50.666</td>
<td>14.666 (±0.720)</td>
<td>58.666</td>
<td>16.333 (±0.272)</td>
<td>65.333</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>6.333 (±0.272)</td>
<td>25.333</td>
<td>9.000 (±0.471)</td>
<td>36.000</td>
<td>11.666 (±0.272)</td>
<td>46.666</td>
<td>12.666 (±0.544)</td>
<td>50.666</td>
<td>15.000 (±0.471)</td>
<td>60.000</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>6.666 (±0.272)</td>
<td>26.666</td>
<td>8.333 (±0.272)</td>
<td>33.333</td>
<td>10.333 (±0.272)</td>
<td>41.333</td>
<td>11.666 (±1.088)</td>
<td>46.666</td>
<td>13.333 (±0.720)</td>
<td>53.333</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>7.666 (±0.981)</td>
<td>30.666</td>
<td>9.666 (±1.440)</td>
<td>38.666</td>
<td>10.333 (±1.088)</td>
<td>41.333</td>
<td>11.666 (±0.981)</td>
<td>46.666</td>
<td>14.000 (±1.247)</td>
<td>56.000</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>6.000 (±0.816)</td>
<td>24.000</td>
<td>8.666 (±0.544)</td>
<td>34.666</td>
<td>10.333 (±0.720)</td>
<td>41.333</td>
<td>11.666 (±0.544)</td>
<td>45.333</td>
<td>13.333 (±0.942)</td>
<td>52.000</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>5.000 (±0.471)</td>
<td>20.000</td>
<td>7.333 (±0.720)</td>
<td>29.333</td>
<td>9.666 (±1.247)</td>
<td>38.666</td>
<td>11.000 (±1.088)</td>
<td>44.000</td>
<td>13.333 (±1.440)</td>
<td>53.333</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>8.000 (±0.816)</td>
<td>32.000</td>
<td>10.333 (±0.981)</td>
<td>41.333</td>
<td>11.666 (±1.247)</td>
<td>46.666</td>
<td>12.666 (±1.247)</td>
<td>50.666</td>
<td>14.333 (±1.440)</td>
<td>57.333</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>7.666 (±0.544)</td>
<td>30.666</td>
<td>9.666 (±0.544)</td>
<td>38.666</td>
<td>11.333 (±0.720)</td>
<td>45.333</td>
<td>12.666 (±0.272)</td>
<td>50.000</td>
<td>15.000 (±0.471)</td>
<td>60.000</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>6.666 (±0.272)</td>
<td>26.666</td>
<td>9.333 (±0.544)</td>
<td>37.333</td>
<td>10.333 (±0.544)</td>
<td>41.333</td>
<td>11.000 (±0.816)</td>
<td>44.000</td>
<td>12.666 (±0.981)</td>
<td>50.666</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.333 (±0.272)</td>
<td>1.333</td>
<td>0.333 (±0.000)</td>
<td>1.333</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.666 (±0.544)</td>
<td>2.666</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water
Values in parentheses are standard error of mean (±S.E.M.)
% Mortality is Transformed % Mortality
Table 8A. Insecticidal activity of some plants extracts in combination with Endosulfan against *Helicoverpa armigera* (larvae)

Per cent Mortality at various concentrations after 24hrs

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Endosulfan (0.035%)</th>
<th>1% Mortality</th>
<th>2% Mortality</th>
<th>3% Mortality</th>
<th>4% Mortality</th>
<th>5% Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (± S.E.M)</td>
<td>% Mortality</td>
<td>Mean (± S.E.M)</td>
<td>% Mortality</td>
<td>Mean (± S.E.M)</td>
<td>% Mortality</td>
</tr>
<tr>
<td>1</td>
<td>Azadirachta indica (SKE)</td>
<td>6.333 (±0.272)</td>
<td>25.333</td>
<td>7.666 (±0.272)</td>
<td>30.666</td>
<td>10.333 (±0.272)</td>
</tr>
<tr>
<td>2</td>
<td>Azadirachta indica (LE)</td>
<td>5.666 (±0.272)</td>
<td>22.666</td>
<td>6.666 (±0.272)</td>
<td>26.666</td>
<td>8.000 (±0.471)</td>
</tr>
<tr>
<td>3</td>
<td>Eucalyptus globulus (LE)</td>
<td>2.666 (±0.272)</td>
<td>10.666</td>
<td>3.666 (±0.272)</td>
<td>14.666</td>
<td>4.666 (±0.720)</td>
</tr>
<tr>
<td>4</td>
<td>Ageratum conyzoides (LE)</td>
<td>3.666 (±0.544)</td>
<td>14.666</td>
<td>5.000 (±0.816)</td>
<td>21.000</td>
<td>7.333 (±0.720)</td>
</tr>
<tr>
<td>5</td>
<td>Datura alba (FE)</td>
<td>5.000 (±0.471)</td>
<td>20.000</td>
<td>6.666 (±0.544)</td>
<td>26.666</td>
<td>8.666 (±0.942)</td>
</tr>
<tr>
<td>6</td>
<td>Nerium indicum (LE)</td>
<td>3.666 (±0.272)</td>
<td>14.666</td>
<td>4.333 (±1.008)</td>
<td>17.333</td>
<td>6.666 (±0.981)</td>
</tr>
<tr>
<td>7</td>
<td>Parthenium hysterophorus (LE)</td>
<td>2.333 (±0.272)</td>
<td>9.333</td>
<td>2.666 (±0.544)</td>
<td>10.666</td>
<td>4.666 (±0.544)</td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara (LE)</td>
<td>4.666 (±0.272)</td>
<td>18.666</td>
<td>5.666 (±0.544)</td>
<td>22.666</td>
<td>7.333 (±0.544)</td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera (LE)</td>
<td>5.333 (±0.272)</td>
<td>21.333</td>
<td>6.333 (±0.544)</td>
<td>25.333</td>
<td>7.666 (±0.544)</td>
</tr>
<tr>
<td>10</td>
<td>Allium sativum (BE)</td>
<td>2.333 (±0.272)</td>
<td>9.333</td>
<td>3.333 (±0.544)</td>
<td>13.333</td>
<td>5.333 (±0.544)</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.000 (±0.000)</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE= fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (± S.E.M.)

% Mortality is Transformed % Mortality
Table 8B. Insecticidal activity of some plant extracts in combination with Endosulfan against *Helicoverpa armigera* (larvae)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Endosulfan (0.035%)</th>
<th>1% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>2% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>3% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>4% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>5% Mean (± S.E.M)</th>
<th>% Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Azadirachta indica (SKE)</td>
<td>7.333 (±0.272)</td>
<td>29.333</td>
<td>9.333 (±0.272)</td>
<td>37.333</td>
<td>12.000 (±0.471)</td>
<td>48.000</td>
<td>13.000 (±0.471)</td>
<td>52.000</td>
<td>13.666 (±0.544)</td>
<td>54.666</td>
</tr>
<tr>
<td>2</td>
<td>Azadirachta indica (LE)</td>
<td>7.000 (±0.471)</td>
<td>28.000</td>
<td>7.666 (±0.544)</td>
<td>30.666</td>
<td>9.333 (±0.272)</td>
<td>37.333</td>
<td>10.000 (±0.471)</td>
<td>40.000</td>
<td>13.000 (±0.471)</td>
<td>52.000</td>
</tr>
<tr>
<td>3</td>
<td>Eucalyptus globulus (LE)</td>
<td>4.333 (±0.272)</td>
<td>17.333</td>
<td>5.000 (±0.272)</td>
<td>20.000</td>
<td>7.333 (±0.272)</td>
<td>29.333</td>
<td>8.333 (±0.272)</td>
<td>33.333</td>
<td>9.444 (±0.272)</td>
<td>37.333</td>
</tr>
<tr>
<td>4</td>
<td>Ageratum conyzoides (LE)</td>
<td>6.666 (±0.272)</td>
<td>26.666</td>
<td>8.000 (±0.272)</td>
<td>32.000</td>
<td>8.666 (±0.272)</td>
<td>34.666</td>
<td>9.666 (±0.272)</td>
<td>38.666</td>
<td>11.666 (±0.272)</td>
<td>46.666</td>
</tr>
<tr>
<td>5</td>
<td>Datura alba (FE)</td>
<td>6.666 (±0.272)</td>
<td>26.666</td>
<td>8.666 (±0.272)</td>
<td>34.666</td>
<td>10.000 (±0.272)</td>
<td>40.000</td>
<td>11.666 (±0.272)</td>
<td>46.666</td>
<td>12.333 (±0.272)</td>
<td>49.333</td>
</tr>
<tr>
<td>6</td>
<td>Nerium indicum (LE)</td>
<td>4.000 (±0.471)</td>
<td>16.000</td>
<td>5.333 (±0.272)</td>
<td>21.333</td>
<td>7.666 (±0.272)</td>
<td>30.666</td>
<td>9.000 (±0.471)</td>
<td>36.000</td>
<td>11.000 (±0.272)</td>
<td>44.000</td>
</tr>
<tr>
<td>7</td>
<td>Parthenium hysterophorus (LE)</td>
<td>3.000 (±0.000)</td>
<td>12.000</td>
<td>3.333 (±0.000)</td>
<td>30.333</td>
<td>4.333 (±0.272)</td>
<td>17.333</td>
<td>6.333 (±0.272)</td>
<td>25.333</td>
<td>7.666 (±0.474)</td>
<td>30.666</td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara (LE)</td>
<td>6.333 (±0.544)</td>
<td>25.333</td>
<td>8.000 (±0.272)</td>
<td>32.000</td>
<td>9.333 (±0.272)</td>
<td>37.333</td>
<td>10.000 (±0.942)</td>
<td>40.000</td>
<td>12.666 (±0.272)</td>
<td>50.666</td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera (LE)</td>
<td>5.666 (±0.272)</td>
<td>22.666</td>
<td>6.333 (±0.272)</td>
<td>25.333</td>
<td>8.000 (±0.000)</td>
<td>32.000</td>
<td>10.000 (±0.272)</td>
<td>42.666</td>
<td>12.333 (±0.544)</td>
<td>49.333</td>
</tr>
<tr>
<td>10</td>
<td>Allium sativum (BE)</td>
<td>3.666 (±0.272)</td>
<td>14.666</td>
<td>4.333 (±0.272)</td>
<td>17.333</td>
<td>5.666 (±0.272)</td>
<td>22.666</td>
<td>7.333 (±0.272)</td>
<td>29.333</td>
<td>8.666 (±0.272)</td>
<td>34.666</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.000 (±0.272)</td>
<td>0.000</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.333 (±0.272)</td>
<td>1.333</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water
Values in parentheses are standard error of mean (±S.E.M.)
% Mortality is Transformed % Mortality
Table 8C. Insecticidal activity of some plant extracts in combination with Endosulfan against *Helicoverpa armigera* (larvae)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Endosulfan (0.035%)</th>
<th>1% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>Mean (± S.E.M)</th>
<th>% Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>9.333</td>
<td>37.333</td>
<td>11.666</td>
<td>46.666</td>
<td>12.666</td>
<td>50.666</td>
<td>14.666</td>
<td>58.666</td>
<td>16.000</td>
<td>64.000</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>8.000</td>
<td>32.000</td>
<td>9.666</td>
<td>38.666</td>
<td>11.666</td>
<td>46.666</td>
<td>10.000</td>
<td>40.000</td>
<td>11.000</td>
<td>44.000</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>5.000</td>
<td>20.000</td>
<td>6.333</td>
<td>25.333</td>
<td>8.666</td>
<td>34.666</td>
<td>10.000</td>
<td>40.000</td>
<td>11.000</td>
<td>44.000</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>7.000</td>
<td>28.000</td>
<td>9.000</td>
<td>36.000</td>
<td>10.333</td>
<td>41.333</td>
<td>11.000</td>
<td>44.000</td>
<td>13.000</td>
<td>52.000</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>7.333</td>
<td>29.333</td>
<td>9.333</td>
<td>37.333</td>
<td>10.666</td>
<td>42.666</td>
<td>12.333</td>
<td>49.333</td>
<td>13.000</td>
<td>52.000</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>5.000</td>
<td>20.000</td>
<td>6.666</td>
<td>26.666</td>
<td>9.000</td>
<td>36.000</td>
<td>10.666</td>
<td>42.666</td>
<td>11.666</td>
<td>46.666</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>3.666</td>
<td>14.666</td>
<td>4.666</td>
<td>18.666</td>
<td>5.666</td>
<td>22.666</td>
<td>7.333</td>
<td>29.333</td>
<td>8.666</td>
<td>34.666</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>4.333</td>
<td>17.333</td>
<td>5.333</td>
<td>21.333</td>
<td>7.000</td>
<td>28.000</td>
<td>8.000</td>
<td>32.000</td>
<td>9.666</td>
<td>38.666</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.333</td>
<td>1.333</td>
<td>0.000</td>
<td>0.000</td>
<td>0.333</td>
<td>1.333</td>
<td>0.000</td>
<td>0.000</td>
<td>0.666</td>
<td>2.666</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality
Table 9A. Ovicidal action of some plant extracts against *Spodoptera litura* (eggs)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract</th>
<th>2% % Mortality (± S.E.M)</th>
<th>4% % Mortality (± S.E.M)</th>
<th>6% % Mortality (± S.E.M)</th>
<th>8% % Mortality (± S.E.M)</th>
<th>10% % Mortality (± S.E.M)</th>
</tr>
</thead>
</table>
| 1      | Azadirachta indica (SKE)  | 7.000 (±0.471)           | 14.000                   | 17.333                   | 21.333                   | 26.666 (±0.544)           
| 2      | Azadirachta indica (LE)   | 6.333 (±0.272)           | 12.666                   | 14.666                   | 17.333                   | 23.333 (±0.272)           
| 3      | Eucalyptus globulus (LE)  | 3.666 (±0.272)           | 7.333 (±0.272)           | 8.666 (±0.272)           | 12.000 (±0.471)           | 15.333 (±0.471)           
| 4      | Ageratum conyzoides (LE)  | 5.666 (±0.544)           | 11.333                   | 14.000                   | 17.333                   | 18.666 (±0.544)           
| 5      | Datura alba (FE)          | 5.333 (±0.544)           | 10.666                   | 13.333                   | 15.333                   | 18.000 (±0.544)           
| 6      | Nerium indicum (LE)       | 3.666 (±0.272)           | 7.333 (±0.272)           | 8.666 (±0.272)           | 10.000 (±0.942)           | 12.000 (±0.942)           
| 7      | Parthenium hysterocephorus (LE) | 2.000 (±0.272)       | 4.000 (±0.272)           | 5.333 (±0.272)           | 6.000 (±0.942)           | 12.000 (±0.942)           
| 8      | Lantana camara (LE)       | 5.000 (±0.816)           | 10.000                   | 12.666                   | 14.666                   | 19.333 (±0.544)           
| 9      | Calotropis procera (LE)   | 5.666 (±0.816)           | 11.333                   | 14.000                   | 16.666                   | 21.333 (±0.544)           
| 10     | Allium sativum (BE)       | 2.666 (±0.272)           | 5.333 (±0.272)           | 6.666 (±0.272)           | 9.333 (±0.272)           | 11.333 (±0.272)           
| 11     | Control (DDW)             | 0.000 (±0.000)           | 0.000 (±0.000)           | 0.000 (±0.000)           | 0.000 (±0.000)           | 0.000 (±0.000)           |

Where, SKE=seed kernel extract, LE=leaf extract, FE= fruit extract, BE=bulb extract, DDW=distilled water.  
Values in parentheses are standard error of mean (± S.E.M).

% Mortality is transformed % Mortality.
Table 9B. Ovicidal action of some plant extracts against *Spodoptera litura* (eggs)

Per cent Mortality of two days old eggs at various concentrations

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract</th>
<th>2% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>4% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>6% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>8% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>10% Mean (± S.E.M)</th>
<th>% Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Azadirachta indica (SKE)</td>
<td>9.000 (±0.471)</td>
<td>18.000</td>
<td>11.333 (±0.544)</td>
<td>22.666</td>
<td>14.000 (±0.720)</td>
<td>23.333</td>
<td>16.333 (±0.544)</td>
<td>28.000</td>
<td>19.666 (±0.272)</td>
<td>39.333</td>
</tr>
<tr>
<td>2</td>
<td>Azadirachta indica (LE)</td>
<td>7.666 (±0.171)</td>
<td>15.333</td>
<td>9.000 (±0.544)</td>
<td>18.000</td>
<td>11.666 (±0.720)</td>
<td>23.333</td>
<td>14.000 (±0.816)</td>
<td>28.000</td>
<td>17.333 (±0.272)</td>
<td>17.333</td>
</tr>
<tr>
<td>3</td>
<td>Eucalyptus globulus (LE)</td>
<td>4.000 (±0.000)</td>
<td>8.000</td>
<td>5.666 (±0.544)</td>
<td>11.333</td>
<td>7.666 (±0.544)</td>
<td>15.333</td>
<td>9.333 (±0.544)</td>
<td>18.666</td>
<td>12.000 (±0.471)</td>
<td>24.000</td>
</tr>
<tr>
<td>4</td>
<td>Ageratum conyzoides (LE)</td>
<td>5.666 (±0.272)</td>
<td>11.333</td>
<td>8.000 (±0.544)</td>
<td>16.000</td>
<td>11.000 (±0.471)</td>
<td>22.000</td>
<td>13.666 (±0.272)</td>
<td>27.333</td>
<td>16.000 (±0.544)</td>
<td>32.000</td>
</tr>
<tr>
<td>5</td>
<td>Datura alba (FE)</td>
<td>7.333 (±0.272)</td>
<td>14.666</td>
<td>8.666 (±0.544)</td>
<td>17.333</td>
<td>10.000 (±0.471)</td>
<td>20.000</td>
<td>13.333 (±0.272)</td>
<td>26.666</td>
<td>15.666 (±0.272)</td>
<td>31.333</td>
</tr>
<tr>
<td>6</td>
<td>Nerium indicum (LE)</td>
<td>4.333 (±0.272)</td>
<td>8.666</td>
<td>5.333 (±0.544)</td>
<td>10.666</td>
<td>8.000 (±0.471)</td>
<td>16.000</td>
<td>9.666 (±0.544)</td>
<td>19.333</td>
<td>12.666 (±0.471)</td>
<td>25.333</td>
</tr>
<tr>
<td>7</td>
<td>Parthenium hysterophorus (LE)</td>
<td>3.333 (±0.272)</td>
<td>6.666</td>
<td>4.333 (±0.544)</td>
<td>8.666</td>
<td>5.333 (±0.471)</td>
<td>10.666</td>
<td>6.666 (±0.544)</td>
<td>19.333</td>
<td>8.666 (±0.272)</td>
<td>17.333</td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara (LE)</td>
<td>6.333 (±0.272)</td>
<td>12.666</td>
<td>8.000 (±0.544)</td>
<td>16.000</td>
<td>9.666 (±0.544)</td>
<td>19.333</td>
<td>12.333 (±0.544)</td>
<td>24.666</td>
<td>15.333 (±0.272)</td>
<td>30.666</td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera (LE)</td>
<td>5.666 (±0.272)</td>
<td>11.333</td>
<td>7.333 (±0.544)</td>
<td>14.666</td>
<td>8.666 (±0.544)</td>
<td>17.333</td>
<td>11.666 (±0.544)</td>
<td>23.333</td>
<td>14.666 (±0.272)</td>
<td>29.333</td>
</tr>
<tr>
<td>10</td>
<td>Allium sativum (BE)</td>
<td>5.333 (±0.272)</td>
<td>10.666</td>
<td>6.333 (±0.544)</td>
<td>12.666</td>
<td>7.666 (±0.544)</td>
<td>15.333</td>
<td>9.333 (±0.720)</td>
<td>18.666</td>
<td>11.333 (±0.471)</td>
<td>22.666</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000 (±0.272)</td>
<td>0.000</td>
<td>0.333 (±0.000)</td>
<td>0.000</td>
<td>0.000 (±0.272)</td>
<td>0.000</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality
### Table 9C. Ovicidal action of some plant extracts against Spodoptera litura (eggs)

<table>
<thead>
<tr>
<th>S. No</th>
<th>Treatment Plant extract</th>
<th>2% Mortality</th>
<th>Mean (± S.E.M)</th>
<th>Mean (± S.E.M)</th>
<th>Mean (± S.E.M)</th>
<th>Mean (± S.E.M)</th>
<th>Mean (± S.E.M)</th>
<th>Mean (± S.E.M)</th>
<th>Mean (± S.E.M)</th>
<th>Mean (± S.E.M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Azadirachta indica (SKE)</td>
<td>11.000</td>
<td>22.000</td>
<td>12.666</td>
<td>25.333</td>
<td>15.000</td>
<td>30.000</td>
<td>18.666</td>
<td>37.333</td>
<td>22.333</td>
</tr>
<tr>
<td>5</td>
<td>Datura alba (FE)</td>
<td>8.000</td>
<td>16.000</td>
<td>9.666</td>
<td>19.333</td>
<td>12.000</td>
<td>24.000</td>
<td>14.666</td>
<td>29.333</td>
<td>17.666</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.333</td>
<td>0.666</td>
<td>1.000</td>
<td>2.000</td>
<td>0.666</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water.

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality.
Table 10A. Ovicidal action of some plant extracts against *Helicoverpa armigera* (eggs)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract</th>
<th>2% Mean (± S.E.M)</th>
<th>2% % Mortality</th>
<th>4% Mean (± S.E.M)</th>
<th>4% % Mortality</th>
<th>6% Mean (± S.E.M)</th>
<th>6% % Mortality</th>
<th>8% Mean (± S.E.M)</th>
<th>8% % Mortality</th>
<th>10% Mean (± S.E.M)</th>
<th>10% % Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>6.333 (±0.272)</td>
<td>12.666</td>
<td>7.333 (±0.272)</td>
<td>14.666</td>
<td>8.333 (±0.544)</td>
<td>16.666</td>
<td>10.666 (±0.544)</td>
<td>21.333</td>
<td>16.000 (±0.471)</td>
<td>32.000</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>5.666 (±0.272)</td>
<td>11.333</td>
<td>6.333 (±0.544)</td>
<td>12.666</td>
<td>7.000 (±0.816)</td>
<td>14.000</td>
<td>8.333 (±0.272)</td>
<td>16.666</td>
<td>13.666 (±0.272)</td>
<td>27.333</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>2.666 (±0.272)</td>
<td>5.333</td>
<td>3.666 (±0.544)</td>
<td>7.333 (±0.272)</td>
<td>5.333 (±0.816)</td>
<td>10.666</td>
<td>7.333 (±0.816)</td>
<td>14.666</td>
<td>9.333 (±0.272)</td>
<td>18.666</td>
</tr>
<tr>
<td>4</td>
<td><em>Agaratum conyzoides</em> (LE)</td>
<td>4.666 (±0.544)</td>
<td>9.333</td>
<td>5.666 (±0.272)</td>
<td>11.333</td>
<td>6.333 (±0.544)</td>
<td>12.666</td>
<td>7.000 (±0.272)</td>
<td>14.000</td>
<td>10.333 (±0.272)</td>
<td>20.666</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>4.000 (±0.471)</td>
<td>8.000</td>
<td>4.666 (±0.544)</td>
<td>9.333</td>
<td>5.666 (±0.272)</td>
<td>11.333</td>
<td>7.000 (±0.272)</td>
<td>15.333</td>
<td>9.666 (±1.361)</td>
<td>19.333</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>2.666 (±0.272)</td>
<td>5.333</td>
<td>3.333 (±0.544)</td>
<td>6.666</td>
<td>4.000 (±0.272)</td>
<td>8.000</td>
<td>5.333 (±0.272)</td>
<td>10.666</td>
<td>7.666 (±0.272)</td>
<td>15.333</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>1.333 (±0.272)</td>
<td>2.666</td>
<td>2.000 (±0.471)</td>
<td>4.000</td>
<td>3.000 (±0.816)</td>
<td>6.000</td>
<td>4.666 (±0.272)</td>
<td>9.333</td>
<td>5.666 (±0.544)</td>
<td>11.333</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>4.000 (±0.471)</td>
<td>8.000</td>
<td>5.000 (±0.816)</td>
<td>10.000</td>
<td>6.000 (±0.272)</td>
<td>12.000</td>
<td>7.000 (±0.272)</td>
<td>14.000</td>
<td>8.333 (±0.544)</td>
<td>16.666</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>3.666 (±0.471)</td>
<td>7.333</td>
<td>4.333 (±0.1088)</td>
<td>8.666</td>
<td>5.666 (±0.544)</td>
<td>11.333</td>
<td>7.333 (±0.981)</td>
<td>14.666</td>
<td>10.666 (±0.272)</td>
<td>21.333</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>2.333 (±0.272)</td>
<td>4.666</td>
<td>3.000 (±0.816)</td>
<td>6.000</td>
<td>4.000 (±0.272)</td>
<td>8.000</td>
<td>4.666 (±0.272)</td>
<td>9.333</td>
<td>7.333 (±0.272)</td>
<td>14.666</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000 (0.000)</td>
<td>0.000</td>
<td>0.000 (0.000)</td>
<td>0.000</td>
<td>0.000 (0.000)</td>
<td>0.000</td>
<td>0.000 (0.000)</td>
<td>0.000</td>
<td>0.333 (0.272)</td>
<td>0.666</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE= fruit extract, BE=bulb extract, DDW=distilled water
Values in parentheses are standard error of mean (±S.E.M.)
% Mortality is Transformed % Mortality
Table 10B. Ovicidal action of some plant extracts against *Helicoverpa armigera* (eggs)

Per cent Mortality of two days old eggs at various concentrations

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Plant extract</th>
<th>2% % Mortality</th>
<th>4% % Mortality</th>
<th>6% % Mortality</th>
<th>8% % Mortality</th>
<th>10% % Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (± S.E.M)</td>
<td>(± S.E.M)</td>
<td>(± S.E.M)</td>
<td>(± S.E.M)</td>
<td>(± S.E.M)</td>
<td>(± S.E.M)</td>
</tr>
<tr>
<td>1</td>
<td>Azadirachta indica</td>
<td>8.333</td>
<td>16.666</td>
<td>24.666</td>
<td>32.000</td>
<td>37.333</td>
</tr>
<tr>
<td></td>
<td>(SKE)</td>
<td>(±0.720)</td>
<td>(±0.981)</td>
<td>(±0.720)</td>
<td>(±0.471)</td>
<td>(±0.272)</td>
</tr>
<tr>
<td>2</td>
<td>Azadirachta indica</td>
<td>7.333</td>
<td>14.666</td>
<td>19.333</td>
<td>25.333</td>
<td>32.666</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td>(±0.272)</td>
<td>(±0.272)</td>
<td>(±0.720)</td>
<td>(±1.186)</td>
<td>(±0.544)</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td>(±0.272)</td>
<td>(±0.544)</td>
<td>(±0.720)</td>
<td>(±0.272)</td>
<td>(±0.544)</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td>(±0.272)</td>
<td>(±0.272)</td>
<td>(±0.272)</td>
<td>(±0.272)</td>
<td>(±0.272)</td>
</tr>
<tr>
<td>5</td>
<td>Datura alba</td>
<td>6.333</td>
<td>12.666</td>
<td>9.000</td>
<td>12.000</td>
<td>14.666</td>
</tr>
<tr>
<td></td>
<td>(FE)</td>
<td>(±0.272)</td>
<td>(±0.272)</td>
<td>(±0.816)</td>
<td>(±0.816)</td>
<td>(±0.544)</td>
</tr>
<tr>
<td>6</td>
<td>Nerium indicum</td>
<td>4.333</td>
<td>8.666</td>
<td>13.333</td>
<td>18.000</td>
<td>11.666</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td>(±0.272)</td>
<td>(±0.272)</td>
<td>(±0.720)</td>
<td>(±0.471)</td>
<td>(±0.272)</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td>(±0.272)</td>
<td>(±0.272)</td>
<td>(±0.272)</td>
<td>(±0.544)</td>
<td>(±0.544)</td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara</td>
<td>6.666</td>
<td>13.333</td>
<td>15.333</td>
<td>19.333</td>
<td>24.000</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td>(±0.272)</td>
<td>(±0.720)</td>
<td>(±0.544)</td>
<td>(±0.816)</td>
<td>(±0.272)</td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procerae</td>
<td>5.666</td>
<td>11.333</td>
<td>13.333</td>
<td>18.666</td>
<td>23.333</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td>(±0.272)</td>
<td>(±0.272)</td>
<td>(±0.272)</td>
<td>(±0.272)</td>
<td>(±0.272)</td>
</tr>
<tr>
<td>10</td>
<td>Allium sativum</td>
<td>4.333</td>
<td>8.666</td>
<td>11.333</td>
<td>13.333</td>
<td>17.333</td>
</tr>
<tr>
<td></td>
<td>(BE)</td>
<td>(±0.272)</td>
<td>(±0.272)</td>
<td>(±0.981)</td>
<td>(±0.720)</td>
<td>(±0.471)</td>
</tr>
<tr>
<td>11</td>
<td>Control</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.333</td>
<td>0.666</td>
</tr>
<tr>
<td></td>
<td>(DDW)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.272)</td>
<td>(0.272)</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality
Table 10C. Ovicidal action of some plant extracts against *Helicoverpa armigera* (eggs)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Plant extract</th>
<th>Mean (± S.E.M)</th>
<th>2% Mortality (± S.E.M)</th>
<th>4% Mortality (± S.E.M)</th>
<th>6% Mortality (± S.E.M)</th>
<th>8% Mortality (± S.E.M)</th>
<th>10% Mortality (± S.E.M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>8.666</td>
<td>17.333</td>
<td>10.000</td>
<td>20.000</td>
<td>13.666</td>
<td>27.333</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>7.333</td>
<td>14.666</td>
<td>8.666</td>
<td>17.333</td>
<td>11.333</td>
<td>22.666</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>7.000</td>
<td>14.000</td>
<td>8.666</td>
<td>17.333</td>
<td>11.000</td>
<td>22.000</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>4.333</td>
<td>8.666</td>
<td>5.666</td>
<td>11.333</td>
<td>7.333</td>
<td>14.666</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>7.333</td>
<td>14.666</td>
<td>9.000</td>
<td>18.000</td>
<td>11.333</td>
<td>22.666</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.333</td>
<td>0.666</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water
Values in parentheses are standard error of mean (±S.E.M.)
% Mortality is Transformed % Mortality
Table 11A. Summary of statistical calculations for mortality response of *Spodoptera litura* (eggs) on treatment with different plant extracts

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract</th>
<th>Regression equation &amp; its analysis</th>
<th>LC&lt;sub&gt;50&lt;/sub&gt;</th>
<th>Relative Ratio</th>
<th>Order of Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>5.4x + 11.4 2.70 11.40 0.964</td>
<td>0.01320</td>
<td>0.450</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>5.2x + 8.6 2.60 8.60 0.968</td>
<td>0.01680</td>
<td>0.572</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>3.8x + 4.2 1.90 4.20 0.984</td>
<td>0.02693</td>
<td>0.918</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>4.5x + 7.3 2.25 7.30 0.976</td>
<td>0.01973</td>
<td>0.672</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>4.3x + 8.30 2.15 8.30 0.966</td>
<td>0.01973</td>
<td>0.672</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>3.5x + 4.5 1.75 4.50 0.979</td>
<td>0.02066</td>
<td>0.704</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>3.4x + 2.2 1.70 2.20 0.987</td>
<td>0.02933</td>
<td>1.000</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>4.0x + 8.40 2.00 8.40 0.966</td>
<td>0.02333</td>
<td>0.795</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>4.6x + 6.6 2.30 6.60 0.977</td>
<td>0.02213</td>
<td>0.754</td>
<td>7</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>3.8x + 4.2 1.90 4.20 0.978</td>
<td>0.02066</td>
<td>0.704</td>
<td>6</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract
m = slope,   b = intercept,   r<sup>2</sup> = determinant coefficient
Table 11B. Summary of statistical calculations for mortality response of Helicoverpa armigera (eggs) on treatment with different plant extracts

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract</th>
<th>Regression equation &amp; its analysis</th>
<th>LC50</th>
<th>Relative Ratio</th>
<th>Order of Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$y$</td>
<td>$m$</td>
<td>$b$</td>
<td>$r^2$</td>
</tr>
<tr>
<td>1</td>
<td>Azadirachta indica</td>
<td>5.3x + 8.70</td>
<td>2.65</td>
<td>8.70</td>
<td>0.971</td>
</tr>
<tr>
<td></td>
<td>(SKE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Azadirachta indica</td>
<td>4.4x + 7.80</td>
<td>2.20</td>
<td>7.80</td>
<td>0.966</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Eucalyptus globulus</td>
<td>3.9x + 3.50</td>
<td>1.95</td>
<td>3.50</td>
<td>0.984</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Ageratum conyzoides</td>
<td>4.2x + 7.00</td>
<td>2.10</td>
<td>7.00</td>
<td>0.973</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Datura alba</td>
<td>3.5x + 7.50</td>
<td>1.75</td>
<td>7.50</td>
<td>0.963</td>
</tr>
<tr>
<td></td>
<td>(FE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Nerium indicum</td>
<td>3.5x + 3.30</td>
<td>1.75</td>
<td>3.30</td>
<td>0.982</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Parthenium hysterophorus</td>
<td>2.8x + 2.80</td>
<td>1.40</td>
<td>2.80</td>
<td>0.987</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara</td>
<td>3.6x + 7.60</td>
<td>1.80</td>
<td>7.60</td>
<td>0.965</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera</td>
<td>4.3x + 4.90</td>
<td>2.15</td>
<td>4.90</td>
<td>0.984</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Allium sativum</td>
<td>3.1x + 4.50</td>
<td>1.55</td>
<td>4.50</td>
<td>0.976</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE= fruit extract, BE=bulb extract

$m$ = slope, $b$ = intercept, $r^2$ = determinant coefficient
Table 12. Ovicidal action of some pesticides against *Spodoptera litura* and *Helicoverpa armigera*

<table>
<thead>
<tr>
<th>Name of the Insecticides (% Conc.) w/v</th>
<th>Mean (± S.E.M.)</th>
<th>% Mortality</th>
<th>Mean (± S.E.M.)</th>
<th>% Mortality</th>
<th>Mean (± S.E.M.)</th>
<th>% Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24 hrs</td>
<td></td>
<td>48 hrs</td>
<td></td>
<td>72 hrs</td>
<td></td>
</tr>
<tr>
<td>1. <em>Spodoptera litura</em></td>
<td>(a) Monocrotaphos (0.04%)</td>
<td>27.666 (±1.088)</td>
<td>55.333</td>
<td>32.000 (±0.000)</td>
<td>64.000</td>
<td>35.333 (±0.272)</td>
</tr>
<tr>
<td>(b) Endosulfan (0.07%)</td>
<td>28.333 (±0.272)</td>
<td>56.666</td>
<td>32.333 (±0.272)</td>
<td>64.666</td>
<td>36.333 (±0.720)</td>
<td>72.666</td>
</tr>
<tr>
<td>(c) Control (DDW)</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.666 (±0.272)</td>
<td>1.333</td>
<td>1.000 (±0.471)</td>
<td>2.000</td>
</tr>
<tr>
<td>2. <em>Helicoverpa armigera</em></td>
<td>(a) Monocrotaphos (0.04%)</td>
<td>23.666 (±0.272)</td>
<td>47.333</td>
<td>28.666 (±0.272)</td>
<td>57.333</td>
<td>32.666 (±0.272)</td>
</tr>
<tr>
<td>(b) Endosulfan (0.07%)</td>
<td>26.333 (±0.272)</td>
<td>52.666</td>
<td>31.333 (±0.272)</td>
<td>62.666</td>
<td>35.666 (±0.272)</td>
<td>71.333</td>
</tr>
<tr>
<td>(c) Control (DDW)</td>
<td>0.333 (±0.272)</td>
<td>0.666</td>
<td>1.000 (±0.471)</td>
<td>2.000</td>
<td>0.666 (±0.272)</td>
<td>1.333</td>
</tr>
</tbody>
</table>

Values in parentheses are standard error of mean (±S.E.M.)
% Mortality is Transformed % Mortality
Where, DDW=distilled water
Table 13A. Ovicidal action of some plant extracts in combination with Monocrotrophos against *Spodoptera litura* (eggs)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Monocrotrophos (0.02%)</th>
<th>Per cent Mortality of one day old eggs at various concentrations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (± S.E.M)</td>
<td>1% % Mortality</td>
</tr>
<tr>
<td>3</td>
<td>Eucalyptus globulus (LE)</td>
<td>6.000</td>
</tr>
<tr>
<td>7</td>
<td>Parthenium hysterophorus (LE)</td>
<td>4.000</td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara (LE)</td>
<td>8.000</td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera (LE)</td>
<td>9.666</td>
</tr>
<tr>
<td>10</td>
<td>Allium sativum (BE)</td>
<td>5.000</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (+S.E.M.)

% Mortality is Transformed % Mortality
Table 13B. Ovicidal action of some plant extracts in combination with Monocrotophos against Spodoptera litura (eggs)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Monocrotophos (0.02%)</th>
<th>1% Mean (± S.E.M)</th>
<th>2% Mean (± S.E.M)</th>
<th>3% Mean (± S.E.M)</th>
<th>4% Mean (± S.E.M)</th>
<th>5% Mean (± S.E.M)</th>
<th>% Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Azadirachta indica (SKE)</td>
<td>13.333 (+0.272)</td>
<td>26.666 (+0.272)</td>
<td>33.333 (+0.544)</td>
<td>40.666 (+0.720)</td>
<td>47.333 (+0.942)</td>
<td>56.000</td>
</tr>
<tr>
<td>2</td>
<td>Azadirachta indica (LE)</td>
<td>12.000 (+0.000)</td>
<td>24.000 (+0.272)</td>
<td>30.666 (+0.544)</td>
<td>37.333 (+0.272)</td>
<td>44.666 (+0.000)</td>
<td>51.333</td>
</tr>
<tr>
<td>3</td>
<td>Eucalyptus globulus (LE)</td>
<td>8.666 (+0.544)</td>
<td>17.333 (+0.272)</td>
<td>22.666 (+0.816)</td>
<td>26.666 (+0.816)</td>
<td>32.000 (+0.471)</td>
<td>40.000</td>
</tr>
<tr>
<td>4</td>
<td>Ageratum conyzoides (LE)</td>
<td>9.333 (+0.272)</td>
<td>18.666 (+0.272)</td>
<td>24.666 (+0.816)</td>
<td>30.000 (+0.981)</td>
<td>37.333 (+0.981)</td>
<td>45.333</td>
</tr>
<tr>
<td>5</td>
<td>Datura alba (FE)</td>
<td>9.666 (+0.272)</td>
<td>19.333 (+0.544)</td>
<td>25.333 (+0.942)</td>
<td>32.000 (+0.816)</td>
<td>40.000 (+0.720)</td>
<td>46.666</td>
</tr>
<tr>
<td>6</td>
<td>Nerium indicum (LE)</td>
<td>8.000 (+0.816)</td>
<td>16.000 (+0.816)</td>
<td>20.000 (+0.544)</td>
<td>25.333 (+0.272)</td>
<td>32.666 (+0.544)</td>
<td>37.333</td>
</tr>
<tr>
<td>7</td>
<td>Parthenium hysterophorus (LE)</td>
<td>7.000 (+0.816)</td>
<td>14.000 (+0.816)</td>
<td>18.000 (+1.186)</td>
<td>22.666 (+0.981)</td>
<td>27.333 (+0.816)</td>
<td>32.000</td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara (LE)</td>
<td>9.666 (+0.272)</td>
<td>19.333 (+0.272)</td>
<td>24.666 (+0.816)</td>
<td>30.666 (+0.981)</td>
<td>36.666 (+1.088)</td>
<td>42.666</td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera (LE)</td>
<td>11.666 (+0.272)</td>
<td>23.333 (+0.272)</td>
<td>29.333 (+0.816)</td>
<td>33.333 (+0.942)</td>
<td>38.000 (+0.942)</td>
<td>44.000</td>
</tr>
<tr>
<td>10</td>
<td>Allium sativum (BE)</td>
<td>8.000 (+0.471)</td>
<td>16.000 (+0.720)</td>
<td>20.666 (+0.816)</td>
<td>26.000 (+0.272)</td>
<td>28.666 (+0.544)</td>
<td>35.333</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.333 (+0.272)</td>
<td>0.666 (+0.272)</td>
<td>0.666 (0.000)</td>
<td>0.000 (0.000)</td>
<td>0.000 (0.000)</td>
<td>0.666</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water
Values in parentheses are standard error of mean (±S.E.M.)
% Mortality is Transformed % Mortality
Table 13C. Ovicidal action of some plant extracts in combination with Monocrotrophos against *Spodoptera litura* (eggs)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Monocrotrophos (0.02%)</th>
<th>Per cent Mortality of three days old eggs at various concentrations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (± S.E.M)</td>
<td>1% Mortality</td>
</tr>
<tr>
<td>1</td>
<td>Azadirachta indica (SKE)</td>
<td>16.333 (±0.544)</td>
</tr>
<tr>
<td>2</td>
<td>Azadirachta indica (LE)</td>
<td>15.333 (±0.544)</td>
</tr>
<tr>
<td>3</td>
<td>Eucalyptus globulus (LE)</td>
<td>12.333 (±0.544)</td>
</tr>
<tr>
<td>4</td>
<td>Ageratum conyzoides (LE)</td>
<td>13.333 (±0.544)</td>
</tr>
<tr>
<td>5</td>
<td>Datura alba (FE)</td>
<td>12.333 (±0.544)</td>
</tr>
<tr>
<td>6</td>
<td>Nerium indicum (LE)</td>
<td>9.666 (±0.544)</td>
</tr>
<tr>
<td>7</td>
<td>Parthenium hysterophorus (LE)</td>
<td>8.000 (±0.544)</td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara (LE)</td>
<td>12.000 (±0.544)</td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera (LE)</td>
<td>14.333 (±0.544)</td>
</tr>
<tr>
<td>10</td>
<td>Allium sativum (BE)</td>
<td>10.333 (±0.544)</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000 (±0.544)</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE= fruit extract, BE=bulb extract, DDW=distilled water
Values in parentheses are standard error of mean (±S.E.M.)
% Mortality is Transformed % Mortality
Table 14A. Ovicidal action of some plant extracts in combination with Monocrotophos against *Helicoverpa armigera* (eggs)

Per cent Mortality of one day old eggs at various concentrations

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Monocrotophos (0.02%)</th>
<th>1% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>2% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>3% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>4% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>5% Mean (± S.E.M)</th>
<th>% Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>8.000</td>
<td>16.000</td>
<td>10.666</td>
<td>13.000</td>
<td>13.000</td>
<td>26.000</td>
<td>14.666</td>
<td>29.333</td>
<td>17.666</td>
<td>35.333</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE= fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality
Table 14B. Ovicidal action of some plant extracts in combination with Monocrotophos against *Helicoverpa armigera* (eggs)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Monocrotophos (0.02%)</th>
<th>1% (± S.E.M)</th>
<th>2% (± S.E.M)</th>
<th>3% (± S.E.M)</th>
<th>4% (± S.E.M)</th>
<th>5% (± S.E.M)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>% Mortality</td>
<td>% Mortality</td>
<td>% Mortality</td>
<td>% Mortality</td>
<td>% Mortality</td>
</tr>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>14.33</td>
<td>28.666</td>
<td>18.000</td>
<td>36.000</td>
<td>21.333</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>(+0.544)</td>
<td>(+0.816)</td>
<td>(+0.720)</td>
<td>(+0.981)</td>
<td>(+1.088)</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>10.333</td>
<td>20.666</td>
<td>13.333</td>
<td>26.666</td>
<td>17.333</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>9.333</td>
<td>18.666</td>
<td>12.666</td>
<td>25.333</td>
<td>16.000</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>10.666</td>
<td>21.333</td>
<td>14.000</td>
<td>29.333</td>
<td>17.333</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>7.333</td>
<td>14.666</td>
<td>11.333</td>
<td>22.666</td>
<td>13.333</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000</td>
<td>0.000</td>
<td>0.333</td>
<td>0.666</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Where: SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality
Table 14C. Ovicidal action of some plant extracts in combination with Monocrotophos against *Helicoverpa armigera* (eggs)

Per cent Mortality of three days old eggs at various concentrations

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Monocrotophos (0.02%)</th>
<th>1% Mean (± S.E.M)</th>
<th>1% % Mortality</th>
<th>2% Mean (± S.E.M)</th>
<th>2% % Mortality</th>
<th>3% Mean (± S.E.M)</th>
<th>3% % Mortality</th>
<th>4% Mean (± S.E.M)</th>
<th>4% % Mortality</th>
<th>5% Mean (± S.E.M)</th>
<th>5% % Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Azadirachta indica (SKE)</td>
<td>17.33 ± 0.720</td>
<td>34.66</td>
<td>20.66 ± 0.544</td>
<td>41.33</td>
<td>24.33 ± 0.272</td>
<td>48.66</td>
<td>27.66 ± 0.272</td>
<td>55.33</td>
<td>30.66 ± 0.544</td>
<td>61.33</td>
</tr>
<tr>
<td>2</td>
<td>Azadirachta indica (LE)</td>
<td>15.66 ± 0.272</td>
<td>31.33</td>
<td>19.00 ± 0.544</td>
<td>38.00</td>
<td>22.66 ± 0.272</td>
<td>45.33</td>
<td>24.66 ± 0.981</td>
<td>49.33</td>
<td>27.00 ± 0.816</td>
<td>54.00</td>
</tr>
<tr>
<td>3</td>
<td>Eucalyptus globulus (LE)</td>
<td>13.66 ± 0.272</td>
<td>27.33</td>
<td>17.33 ± 0.544</td>
<td>34.66</td>
<td>20.33 ± 0.720</td>
<td>40.66</td>
<td>22.00 ± 0.471</td>
<td>44.00</td>
<td>24.33 ± 0.544</td>
<td>48.66</td>
</tr>
<tr>
<td>4</td>
<td>Ageratum conyzoides (LE)</td>
<td>12.33 ± 0.720</td>
<td>24.66</td>
<td>15.66 ± 0.981</td>
<td>31.33</td>
<td>18.66 ± 1.186</td>
<td>37.33</td>
<td>20.66 ± 0.981</td>
<td>41.33</td>
<td>23.66 ± 1.360</td>
<td>47.33</td>
</tr>
<tr>
<td>5</td>
<td>Datura alba (FE)</td>
<td>11.00 ± 0.816</td>
<td>22.00</td>
<td>14.66 ± 0.720</td>
<td>29.33</td>
<td>17.33 ± 0.544</td>
<td>34.66</td>
<td>20.00 ± 0.471</td>
<td>40.00</td>
<td>23.33 ± 0.544</td>
<td>46.66</td>
</tr>
<tr>
<td>6</td>
<td>Nerium indicum (LE)</td>
<td>11.00 ± 0.471</td>
<td>22.00</td>
<td>14.66 ± 0.544</td>
<td>29.33</td>
<td>18.00 ± 0.471</td>
<td>36.00</td>
<td>20.33 ± 0.272</td>
<td>40.66</td>
<td>24.33 ± 0.544</td>
<td>48.66</td>
</tr>
<tr>
<td>7</td>
<td>Parthenium hysterophorus (LE)</td>
<td>10.33 ± 0.720</td>
<td>20.66</td>
<td>12.00 ± 0.816</td>
<td>24.00</td>
<td>14.66 ± 0.720</td>
<td>29.33</td>
<td>17.66 ± 0.720</td>
<td>35.33</td>
<td>20.33 ± 0.544</td>
<td>40.66</td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara (LE)</td>
<td>14.66 ± 0.272</td>
<td>29.33</td>
<td>18.33 ± 0.272</td>
<td>36.66</td>
<td>20.33 ± 1.186</td>
<td>40.66</td>
<td>21.66 ± 0.942</td>
<td>43.33</td>
<td>25.00 ± 0.942</td>
<td>50.00</td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera (LE)</td>
<td>13.33 ± 0.720</td>
<td>26.66</td>
<td>17.00 ± 1.247</td>
<td>34.00</td>
<td>19.66 ± 0.720</td>
<td>39.33</td>
<td>21.33 ± 0.544</td>
<td>42.66</td>
<td>23.33 ± 0.544</td>
<td>46.66</td>
</tr>
<tr>
<td>10</td>
<td>Allium sativum (BE)</td>
<td>8.66 ± 0.544</td>
<td>17.33</td>
<td>14.00 ± 0.942</td>
<td>38.00</td>
<td>16.00 ± 0.942</td>
<td>32.00</td>
<td>18.66 ± 0.544</td>
<td>37.33</td>
<td>22.33 ± 0.272</td>
<td>44.66</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.00 ± 0.000</td>
<td>0.00</td>
<td>0.00 ± 0.000</td>
<td>0.00</td>
<td>0.66 ± 0.272</td>
<td>1.33</td>
<td>0.00 ± 0.000</td>
<td>0.00</td>
<td>0.66 ± 0.272</td>
<td>1.33</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE= fruit extract, BE= bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality
Table 15A. Ovicidal action of some plant extracts in combination with Endosulfan against Spodoptera litura (eggs)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Endosulfan (0.035%)</th>
<th>1% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>2% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>3% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>4% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>5% Mean (± S.E.M)</th>
<th>% Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Azadirachta indica (SKE)</td>
<td>10.333 (±0.272)</td>
<td>20.666</td>
<td>13.333 (±0.272)</td>
<td>26.666</td>
<td>16.666 (±0.544)</td>
<td>33.333</td>
<td>19.666 (±0.272)</td>
<td>39.333</td>
<td>24.333 (±0.272)</td>
<td>48.666</td>
</tr>
<tr>
<td>2</td>
<td>Azadirachta indica (LE)</td>
<td>9.333 (±0.544)</td>
<td>18.666</td>
<td>12.666 (±0.720)</td>
<td>25.333</td>
<td>16.000 (±0.471)</td>
<td>32.000</td>
<td>19.000 (±0.471)</td>
<td>38.000</td>
<td>22.000 (±0.816)</td>
<td>44.000</td>
</tr>
<tr>
<td>3</td>
<td>Eucalyptus globulus (LE)</td>
<td>7.333 (±0.272)</td>
<td>14.666</td>
<td>11.000 (±0.471)</td>
<td>22.000</td>
<td>13.666 (±0.544)</td>
<td>27.333</td>
<td>16.666 (±0.544)</td>
<td>33.333</td>
<td>19.333 (±0.272)</td>
<td>38.666</td>
</tr>
<tr>
<td>4</td>
<td>Ageratum conyzoides (LE)</td>
<td>7.666 (±0.272)</td>
<td>15.333</td>
<td>11.333 (±0.544)</td>
<td>22.666</td>
<td>14.333 (±0.544)</td>
<td>28.666</td>
<td>18.333 (±0.544)</td>
<td>36.666</td>
<td>21.333 (±0.272)</td>
<td>42.666</td>
</tr>
<tr>
<td>5</td>
<td>Datura alba (FE)</td>
<td>8.333 (±0.272)</td>
<td>16.666</td>
<td>11.666 (±0.544)</td>
<td>23.333</td>
<td>14.000 (±0.981)</td>
<td>28.000</td>
<td>17.666 (±0.720)</td>
<td>35.333</td>
<td>21.333 (±0.272)</td>
<td>42.666</td>
</tr>
<tr>
<td>6</td>
<td>Nerium indicum (LE)</td>
<td>6.000 (±0.471)</td>
<td>12.000</td>
<td>9.666 (±0.272)</td>
<td>19.333</td>
<td>11.666 (±0.544)</td>
<td>23.333</td>
<td>14.333 (±0.720)</td>
<td>28.666</td>
<td>17.000 (±0.816)</td>
<td>34.000</td>
</tr>
<tr>
<td>7</td>
<td>Parthenium hysterophorus (LE)</td>
<td>5.000 (±0.471)</td>
<td>10.000</td>
<td>7.666 (±0.544)</td>
<td>15.333</td>
<td>10.000 (±0.816)</td>
<td>20.000</td>
<td>13.000 (±0.816)</td>
<td>26.000</td>
<td>16.333 (±0.720)</td>
<td>32.666</td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara (LE)</td>
<td>8.333 (±0.720)</td>
<td>16.666</td>
<td>11.333 (±0.544)</td>
<td>22.666</td>
<td>14.333 (±0.272)</td>
<td>28.666</td>
<td>17.666 (±0.272)</td>
<td>35.333</td>
<td>20.666 (±0.720)</td>
<td>41.333</td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera (LE)</td>
<td>9.000 (±0.471)</td>
<td>18.000</td>
<td>12.333 (±0.544)</td>
<td>24.666</td>
<td>14.666 (±0.544)</td>
<td>29.333</td>
<td>18.333 (±0.720)</td>
<td>36.666</td>
<td>21.000 (±0.816)</td>
<td>42.000</td>
</tr>
<tr>
<td>10</td>
<td>Allium sativum (BE)</td>
<td>5.666 (±0.272)</td>
<td>11.333</td>
<td>8.666 (±0.544)</td>
<td>17.333</td>
<td>11.333 (±0.720)</td>
<td>22.666</td>
<td>14.333 (±0.272)</td>
<td>28.666</td>
<td>15.666 (±0.544)</td>
<td>31.333</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.000 (±0.000)</td>
<td>0.000</td>
<td>0.333 (±0.272)</td>
<td>0.666</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality
Table 15B. Ovicidal action of some plant extracts in combination with Endosulfan against Spodoptera litura (eggs)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Endosulfan (0.035%)</th>
<th>1% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>5% Mean (± S.E.M)</th>
<th>% Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Azadirachta indica (SKE)</td>
<td>13.000</td>
<td>26.000</td>
<td>17.333</td>
<td>34.666</td>
<td>20.666</td>
<td>41.333</td>
<td>24.000</td>
<td>48.000</td>
<td>26.333</td>
<td>52.666</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Ageratum conyzoides (LE)</td>
<td>10.000</td>
<td>20.000</td>
<td>14.333</td>
<td>28.666</td>
<td>17.666</td>
<td>35.333</td>
<td>20.666</td>
<td>41.333</td>
<td>23.333</td>
<td>46.666</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Datura alba (FE)</td>
<td>11.000</td>
<td>22.000</td>
<td>14.666</td>
<td>29.333</td>
<td>18.000</td>
<td>36.000</td>
<td>20.333</td>
<td>40.666</td>
<td>23.000</td>
<td>46.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara (LE)</td>
<td>10.000</td>
<td>20.000</td>
<td>14.333</td>
<td>28.666</td>
<td>16.666</td>
<td>35.333</td>
<td>20.333</td>
<td>40.666</td>
<td>23.000</td>
<td>46.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera (LE)</td>
<td>11.000</td>
<td>22.000</td>
<td>14.666</td>
<td>29.333</td>
<td>18.333</td>
<td>36.666</td>
<td>21.333</td>
<td>42.666</td>
<td>24.000</td>
<td>48.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE= fruit extract, BE=bulb extract, DDW=distilled water
Values in parentheses are standard error of mean (±S.E.M.)
% Mortality is Transformed % Mortality
Table 15C. Ovicidal action of some plant extracts in combination with Endosulfan against *Spodoptera litura* (eggs)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Endosulfan (0.035%)</th>
<th>1% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>2% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>3% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>4% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>5% Mean (± S.E.M)</th>
<th>% Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>16.666</td>
<td>33.333</td>
<td>20.666</td>
<td>41.333</td>
<td>24.000</td>
<td>48.000</td>
<td>27.666</td>
<td>55.333</td>
<td>31.666</td>
<td>63.333</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>13.333</td>
<td>26.666</td>
<td>16.666</td>
<td>33.333</td>
<td>19.000</td>
<td>38.000</td>
<td>20.666</td>
<td>41.333</td>
<td>24.000</td>
<td>54.666</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>15.000</td>
<td>30.000</td>
<td>18.666</td>
<td>37.333</td>
<td>22.000</td>
<td>44.000</td>
<td>24.000</td>
<td>48.000</td>
<td>27.333</td>
<td>54.666</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>12.000</td>
<td>24.000</td>
<td>15.333</td>
<td>30.666</td>
<td>17.666</td>
<td>35.333</td>
<td>20.333</td>
<td>40.666</td>
<td>23.333</td>
<td>47.333</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>8.333</td>
<td>16.666</td>
<td>12.000</td>
<td>24.000</td>
<td>15.333</td>
<td>30.666</td>
<td>17.666</td>
<td>35.333</td>
<td>20.000</td>
<td>40.000</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>14.666</td>
<td>29.333</td>
<td>18.333</td>
<td>36.666</td>
<td>21.000</td>
<td>42.000</td>
<td>24.000</td>
<td>48.000</td>
<td>27.333</td>
<td>54.666</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>15.000</td>
<td>30.000</td>
<td>19.333</td>
<td>38.666</td>
<td>22.333</td>
<td>44.666</td>
<td>25.333</td>
<td>50.666</td>
<td>28.666</td>
<td>57.333</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BD)</td>
<td>10.333</td>
<td>20.666</td>
<td>14.666</td>
<td>29.333</td>
<td>17.000</td>
<td>34.000</td>
<td>19.333</td>
<td>38.666</td>
<td>22.000</td>
<td>44.000</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.333</td>
<td>0.666</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.333</td>
<td>0.666</td>
<td>0.000</td>
<td>1.333</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE= fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality
Table 16A. Ovicidal action of some plant extracts in combination with Endosulfan against *Helicoverpa armigera* (eggs)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Endosulfan (0.035%)</th>
<th>1% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>2% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>3% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>4% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>5% Mean (± S.E.M)</th>
<th>% Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>9.333</td>
<td>18.666</td>
<td>11.000</td>
<td>22.000</td>
<td>12.000</td>
<td>24.000</td>
<td>16.333</td>
<td>32.666</td>
<td>21.333</td>
<td>42.666</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>5.666</td>
<td>11.333</td>
<td>8.000</td>
<td>16.000</td>
<td>9.666</td>
<td>19.333</td>
<td>13.666</td>
<td>27.333</td>
<td>17.333</td>
<td>34.666</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>8.000</td>
<td>16.000</td>
<td>10.666</td>
<td>21.333</td>
<td>11.333</td>
<td>22.666</td>
<td>14.000</td>
<td>28.000</td>
<td>19.000</td>
<td>38.000</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>7.666</td>
<td>15.333</td>
<td>10.000</td>
<td>20.000</td>
<td>10.666</td>
<td>21.333</td>
<td>14.666</td>
<td>29.333</td>
<td>19.000</td>
<td>38.000</td>
</tr>
<tr>
<td>11</td>
<td>Control</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water
Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is transformed % Mortality.
Table 16B. Ovicidal action of some plant extracts in combination with Endosulfan against Helicoverpa armigera (eggs)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Endosulfan (0.035%)</th>
<th>1% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>2% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>3% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>4% Mean (± S.E.M)</th>
<th>% Mortality</th>
<th>5% Mean (± S.E.M)</th>
<th>% Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Azadirachta indica (SKE)</td>
<td>13.666 ± 0.720</td>
<td>27.333</td>
<td>18.666 ± 0.720</td>
<td>37.333</td>
<td>23.000 ± 0.471</td>
<td>46.000</td>
<td>25.333 ± 0.981</td>
<td>50.666</td>
<td>27.333 ± 0.544</td>
<td>54.666</td>
</tr>
<tr>
<td>2</td>
<td>Azadirachta indica (LE)</td>
<td>12.666 ± 0.720</td>
<td>25.333</td>
<td>16.333 ± 0.720</td>
<td>32.666</td>
<td>20.666 ± 0.981</td>
<td>41.333</td>
<td>24.000 ± 0.471</td>
<td>48.000</td>
<td>25.666 ± 0.544</td>
<td>51.333</td>
</tr>
<tr>
<td>3</td>
<td>Eucalyptus globulus (LE)</td>
<td>11.000 ± 0.272</td>
<td>22.000</td>
<td>14.333 ± 0.272</td>
<td>28.666</td>
<td>19.333 ± 0.720</td>
<td>38.666</td>
<td>21.333 ± 0.272</td>
<td>42.666</td>
<td>24.000 ± 0.471</td>
<td>48.000</td>
</tr>
<tr>
<td>4</td>
<td>Ageratum conyzoides (LE)</td>
<td>9.666 ± 0.544</td>
<td>19.333</td>
<td>12.666 ± 0.544</td>
<td>25.333</td>
<td>17.333 ± 0.272</td>
<td>34.666</td>
<td>20.000 ± 0.471</td>
<td>40.000</td>
<td>22.666 ± 0.272</td>
<td>45.333</td>
</tr>
<tr>
<td>5</td>
<td>Datura alba (FE)</td>
<td>8.333 ± 0.720</td>
<td>16.666</td>
<td>11.333 ± 0.720</td>
<td>22.666</td>
<td>16.666 ± 0.544</td>
<td>33.333</td>
<td>19.666 ± 0.544</td>
<td>39.333</td>
<td>22.333 ± 0.272</td>
<td>44.666</td>
</tr>
<tr>
<td>6</td>
<td>Nerium indicum (LE)</td>
<td>7.000 ± 0.471</td>
<td>14.000</td>
<td>10.666 ± 0.544</td>
<td>21.333</td>
<td>15.000 ± 0.471</td>
<td>30.000</td>
<td>17.333 ± 0.272</td>
<td>34.666</td>
<td>20.333 ± 0.544</td>
<td>40.666</td>
</tr>
<tr>
<td>7</td>
<td>Parthenium hysterophorus (LE)</td>
<td>6.333 ± 0.272</td>
<td>12.666</td>
<td>11.333 ± 0.272</td>
<td>22.666</td>
<td>14.333 ± 0.272</td>
<td>28.666</td>
<td>15.666 ± 0.272</td>
<td>31.333</td>
<td>19.666 ± 0.272</td>
<td>39.333</td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara (LE)</td>
<td>11.333 ± 0.272</td>
<td>22.666</td>
<td>14.666 ± 0.272</td>
<td>29.333</td>
<td>19.000 ± 0.720</td>
<td>38.000</td>
<td>19.666 ± 0.544</td>
<td>39.333</td>
<td>22.333 ± 0.720</td>
<td>44.666</td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera (LE)</td>
<td>9.666 ± 0.272</td>
<td>19.333</td>
<td>12.666 ± 0.272</td>
<td>27.333</td>
<td>17.666 ± 0.544</td>
<td>35.333</td>
<td>18.666 ± 1.440</td>
<td>37.333</td>
<td>21.333 ± 0.720</td>
<td>42.666</td>
</tr>
<tr>
<td>10</td>
<td>Allium sativum (BE)</td>
<td>7.666 ± 0.544</td>
<td>15.333</td>
<td>9.666 ± 0.544</td>
<td>19.333</td>
<td>14.333 ± 0.272</td>
<td>28.666</td>
<td>16.000 ± 0.272</td>
<td>32.000</td>
<td>19.666 ± 0.720</td>
<td>39.333</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000 ± 0.000</td>
<td>0.000</td>
<td>0.000 ± 0.000</td>
<td>0.000</td>
<td>0.333 ± 0.272</td>
<td>0.666</td>
<td>0.000 ± 0.000</td>
<td>0.000</td>
<td>0.000 ± 0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)

% Mortality is Transformed % Mortality
Table 16C. Ovicidal action of some plant extracts in combination with Endosulfan against *Helicoverpa armigera* (eggs)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Treatment Plant extract + Endosulfan (0.035%)</th>
<th>Mean % Mortality (± S.E.M)</th>
<th>Mean % Mortality (± S.E.M)</th>
<th>% Mortality (± S.E.M)</th>
<th>Mean % Mortality (± S.E.M)</th>
<th>Mean % Mortality (± S.E.M)</th>
<th>Mean % Mortality (± S.E.M)</th>
<th>Mean % Mortality (± S.E.M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Azadirachta indica (SKE)</td>
<td>18.333 (-0.272)</td>
<td>36.666 (-0.544)</td>
<td>22.666 (-0.720)</td>
<td>45.333 (-0.544)</td>
<td>27.333 (-0.720)</td>
<td>54.666 (-0.981)</td>
<td>31.333 (-0.981)</td>
</tr>
<tr>
<td>2</td>
<td>Azadirachta indica (LE)</td>
<td>15.666 (-0.272)</td>
<td>31.333 (-0.471)</td>
<td>20.000 (-0.471)</td>
<td>40.000 (-0.544)</td>
<td>24.333 (-0.544)</td>
<td>48.666 (-0.7)</td>
<td>29.000 (-0.7)</td>
</tr>
<tr>
<td>3</td>
<td>Eucalyptus globules (LE)</td>
<td>14.666 (-0.544)</td>
<td>29.333 (-0.720)</td>
<td>18.666 (-0.720)</td>
<td>37.333 (-0.544)</td>
<td>22.666 (-0.544)</td>
<td>45.333 (-0.544)</td>
<td>26.666 (-0.544)</td>
</tr>
<tr>
<td>4</td>
<td>Ageratum conyzoides (LE)</td>
<td>13.333 (-0.272)</td>
<td>26.666 (-0.720)</td>
<td>17.333 (-0.720)</td>
<td>34.666 (-0.720)</td>
<td>21.000 (-0.816)</td>
<td>42.000 (-0.942)</td>
<td>25.000 (-1.247)</td>
</tr>
<tr>
<td>5</td>
<td>Datura alba (FE)</td>
<td>10.666 (-0.272)</td>
<td>21.333 (-0.272)</td>
<td>14.666 (-0.272)</td>
<td>29.333 (-0.272)</td>
<td>18.666 (-1.186)</td>
<td>37.333 (-0.942)</td>
<td>22.000 (-1.247)</td>
</tr>
<tr>
<td>6</td>
<td>Nerium indicum (LE)</td>
<td>10.666 (-0.720)</td>
<td>21.333 (-0.720)</td>
<td>14.333 (-0.720)</td>
<td>28.666 (-0.544)</td>
<td>19.333 (-0.544)</td>
<td>38.666 (-0.272)</td>
<td>22.666 (-1.440)</td>
</tr>
<tr>
<td>7</td>
<td>Parthenium hysterophorus (LE)</td>
<td>9.666 (-0.272)</td>
<td>19.333 (-0.720)</td>
<td>12.666 (-0.720)</td>
<td>25.333 (-0.720)</td>
<td>16.666 (-0.720)</td>
<td>33.333 (-0.942)</td>
<td>20.000 (-1.360)</td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara (LE)</td>
<td>14.666 (-0.272)</td>
<td>29.333 (-0.720)</td>
<td>18.666 (-0.720)</td>
<td>37.333 (-0.720)</td>
<td>23.333 (-0.720)</td>
<td>46.666 (-0.544)</td>
<td>27.666 (-0.720)</td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera (LE)</td>
<td>13.666 (-0.272)</td>
<td>27.333 (-0.272)</td>
<td>17.666 (-0.272)</td>
<td>35.333 (-0.272)</td>
<td>22.333 (-0.272)</td>
<td>44.666 (-0.544)</td>
<td>25.666 (-0.720)</td>
</tr>
<tr>
<td>10</td>
<td>Allium sativum (BE)</td>
<td>9.000 (-0.816)</td>
<td>18.000 (-0.471)</td>
<td>13.000 (-0.816)</td>
<td>26.000 (-0.816)</td>
<td>17.000 (-0.816)</td>
<td>34.000 (-0.981)</td>
<td>20.666 (-0.816)</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.000 (-0.000)</td>
<td>0.000 (-0.000)</td>
<td>0.000 (-0.000)</td>
<td>0.000 (-0.000)</td>
<td>0.000 (-0.000)</td>
<td>0.000 (-0.272)</td>
<td>0.666 (-0.272)</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (+S.E.M.)

% Mortality is Transformed % Mortality
Table 17. Numerical values of $\chi^2$ and rank correlation of hourly treatments against insects larvae/eggs

<table>
<thead>
<tr>
<th>Insects and Treatments</th>
<th>$\chi^2$</th>
<th>Rank Correlation (Hourly treatments)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>X on Y (24-48)</td>
</tr>
<tr>
<td><strong>LARVAE:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Plant Extracts (P.E.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. <em>Spodoptera litura</em></td>
<td>1.91</td>
<td>0.95</td>
</tr>
<tr>
<td>2. <em>Helicoverpa armigera</em></td>
<td>5.82</td>
<td>0.89</td>
</tr>
<tr>
<td>2. PE + Monocrotophos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. <em>Spodoptera litura</em></td>
<td>1.38</td>
<td>0.95</td>
</tr>
<tr>
<td>2. <em>Helicoverpa armigera</em></td>
<td>6.33</td>
<td>0.92</td>
</tr>
<tr>
<td>3. PE + Endosulfan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. <em>Spodoptera litura</em></td>
<td>0.73</td>
<td>0.98</td>
</tr>
<tr>
<td>2. <em>Helicoverpa armigera</em></td>
<td>0.61</td>
<td>0.96</td>
</tr>
<tr>
<td><strong>EGGS:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Plant Extracts (P.E.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. <em>Spodoptera litura</em></td>
<td>0.88</td>
<td>0.91</td>
</tr>
<tr>
<td>2. <em>Helicoverpa armigera</em></td>
<td>1.02</td>
<td>0.80</td>
</tr>
<tr>
<td>2. PE + Monocrotophos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. <em>Spodoptera litura</em></td>
<td>1.52</td>
<td>0.81</td>
</tr>
<tr>
<td>2. <em>Helicoverpa armigera</em></td>
<td>2.08</td>
<td>0.80</td>
</tr>
<tr>
<td>3. PE + Endosulfan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. <em>Spodoptera litura</em></td>
<td>4.24</td>
<td>0.86</td>
</tr>
<tr>
<td>2. <em>Helicoverpa armigera</em></td>
<td>7.12</td>
<td>0.55</td>
</tr>
</tbody>
</table>

All the $\chi^2$ values were significant at 5% level of significance ($P<0.05$, df=8).
Tables 18A: Number of eggs laid by *S. litura* and their viability on treated strips/sectors of different plant extracts

(Choice method)

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Treatments plant extracts</th>
<th>Average number of eggs laid by female</th>
<th>Average number of eggs hatched (Viability)</th>
<th>Average hatching period (Incubation Period)</th>
<th>Oviposition index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Concentration (%)</td>
<td>Concentration (%)</td>
<td>Concentration (%)</td>
<td>Concentration (%)</td>
</tr>
</tbody>
</table>
| 1     | *Azadirachta indica*  
       | (SKE)                        | 33.333                               | 26.333                                     | 5                                         | 0.359            |
| 2     | *Azadirachta indica*        
       | (LE)                         | 38.333                               | 31.666                                     | 4                                         | 0.413            |
| 3     | *Eucalyptus globulus*       
       | (LE)                         | 43.333                               | 35.333                                     | 4                                         | 0.467            |
| 4     | *Ageratum conyzoides*       
       | (LE)                         | 62.333                               | 53.666                                     | 5                                         | 0.672            |
| 5     | *Datura alba*               
       | (FE)                         | 45.000                               | 35.333                                     | 4                                         | 0.485            |
| 6     | *Nerium indicum*            
       | (LE)                         | 56.666                               | 45.333                                     | 4                                         | 0.611            |
| 7     | *Parthenium hysterophorus*  
       | (LE)                         | 70.000                               | 59.333                                     | 3                                         | 0.755            |
| 8     | *Lantana camara*            
       | (LE)                         | 45.666                               | 37.333                                     | 4                                         | 0.492            |
| 9     | *Calotropis procera*        
       | (LE)                         | 41.333                               | 31.333                                     | 4                                         | 0.446            |
| 10    | *Allium sativum*            
       | (BE)                         | 55.333                               | 46.333                                     | 4                                         | 0.597            |
| 11    | Control                     
       | (DDW)                        | 92.333                               | 86.000                                     | 3                                         | 1.000            |

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water
Tables 18B: Number of eggs laid by *H. armigera* and their viability on treated strips / sectors of different plant 

(Choice method)

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Treatments plant extracts</th>
<th>Average number of eggs laid by female</th>
<th>Average number of eggs hatched (Viability)</th>
<th>Average hatching period (in days) (Incubation Period)</th>
<th>Oviposition index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Concentration (%)</td>
<td>Concentration (%)</td>
<td>Concentration (%)</td>
<td>Concentration (%)</td>
</tr>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>41.000 30.666 24.666</td>
<td>34.666 25.666 16.666</td>
<td>4 5 6</td>
<td>0.442 0.347 0.293</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>44.666 37.000 27.000</td>
<td>37.333 32.000 20.333</td>
<td>4 4 5</td>
<td>0.482 0.418 0.321</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>58.000 48.333 37.333</td>
<td>51.666 43.000 26.333</td>
<td>4 4 4</td>
<td>0.625 0.547 0.444</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>46.000 37.000 28.333</td>
<td>40.333 32.333 23.333</td>
<td>4 4 4</td>
<td>0.496 0.418 0.337</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>44.000 34.666 28.000</td>
<td>38.333 28.666 19.666</td>
<td>4 4 5</td>
<td>0.474 0.392 0.333</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>62.000 52.000 36.333</td>
<td>55.666 47.333 27.666</td>
<td>4 4 4</td>
<td>0.669 0.588 0.432</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorous</em> (LE)</td>
<td>78.666 68.000 54.666</td>
<td>71.333 62.000 47.000</td>
<td>3 3 4</td>
<td>0.848 0.769 0.650</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>48.000 42.333 33.333</td>
<td>39.666 36.333 22.666</td>
<td>4 5 5</td>
<td>0.517 0.479 0.396</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>49.333 41.666 32.666</td>
<td>42.666 35.333 21.000</td>
<td>4 4 5</td>
<td>0.532 0.471 0.388</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>63.000 52.000 39.333</td>
<td>57.000 50.666 34.666</td>
<td>4 4 4</td>
<td>0.679 0.588 0.468</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>92.666 88.333 84.000</td>
<td>90.000 82.333 79.333</td>
<td>3 3 3</td>
<td>1.000 1.000 1.000</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE= fruit extract, BE=bulb extract, DDW=distilled water
Tables 19A: Number of eggs laid by *S. litura* and their viability on treated strips / sectors of different plant extracts in combination with Monocrotophos.

(Choice method)

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Treatments plant extracts + Monocrotophos (0.02%)</th>
<th>Average number of eggs laid by female Concentration (%)</th>
<th>Average number of eggs hatched (Viability) Concentration (%)</th>
<th>Average hatching period (in days) Concentration (%)</th>
<th>Oviposition index Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>17.000</td>
<td>13.333</td>
<td>5</td>
<td>0.197</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>18.666</td>
<td>15.000</td>
<td>5</td>
<td>0.217</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>27.333</td>
<td>23.000</td>
<td>5</td>
<td>0.317</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>29.666</td>
<td>24.333</td>
<td>5</td>
<td>0.344</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>21.666</td>
<td>18.000</td>
<td>4</td>
<td>0.251</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>29.666</td>
<td>25.333</td>
<td>4</td>
<td>0.344</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>39.000</td>
<td>31.333</td>
<td>4</td>
<td>0.453</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>21.333</td>
<td>17.000</td>
<td>4</td>
<td>0.248</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>22.666</td>
<td>17.666</td>
<td>5</td>
<td>0.263</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>25.666</td>
<td>20.000</td>
<td>4</td>
<td>0.298</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>86.000</td>
<td>81.666</td>
<td>3</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water
Tables 19B: Number of eggs laid by *H. armigera* and their viability on treated strips / sectors of different plant extracts in combination with Monocrotophos.

(Choice method)

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Treatments plant extracts + Monocrotophos (0.02%)</th>
<th>Average number of eggs laid by female Concentration (%)</th>
<th>Average number of eggs hatched (Viability) Concentration (%)</th>
<th>Average hatching period (in days) Concentration (%)</th>
<th>Oviposition index Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1 2.5 5</td>
<td>1 2.5 5</td>
<td>1 2.5 5</td>
<td>1 2.5 5</td>
</tr>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>32.000 24.333 17.000</td>
<td>24.666 18.333 11.666</td>
<td>5 5 6</td>
<td>0.352 0.279 0.206</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>36.666 29.000 20.666</td>
<td>27.333 22.333 13.666</td>
<td>5 5 6</td>
<td>0.404 0.333 0.251</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>50.666 43.666 33.666</td>
<td>43.000 34.333 24.666</td>
<td>4 5 6</td>
<td>0.558 0.501 0.408</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>39.000 32.333 24.666</td>
<td>34.333 27.333 18.333</td>
<td>4 5 5</td>
<td>0.430 0.371 0.299</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>37.666 31.666 22.000</td>
<td>31.000 25.000 15.000</td>
<td>4 5 5</td>
<td>0.415 0.363 0.267</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>56.333 50.333 40.333</td>
<td>49.000 43.000 29.666</td>
<td>4 5 5</td>
<td>0.621 0.578 0.489</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>71.666 64.000 53.333</td>
<td>63.333 46.666 42.666</td>
<td>3 4 4</td>
<td>0.790 0.735 0.647</td>
</tr>
<tr>
<td>8</td>
<td><em>Lonchana camara</em> (LE)</td>
<td>40.333 33.333 23.666</td>
<td>34.333 24.666 17.000</td>
<td>4 5 5</td>
<td>0.444 0.383 0.287</td>
</tr>
<tr>
<td>9</td>
<td><em>Colotropis procera</em> (LE)</td>
<td>41.666 35.000 24.333</td>
<td>35.000 27.333 17.666</td>
<td>4 5 5</td>
<td>0.459 0.402 0.295</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>55.666 48.333 36.666</td>
<td>46.333 40.666 29.000</td>
<td>4 4 5</td>
<td>0.613 0.555 0.445</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>90.666 87.000 82.333</td>
<td>84.666 80.666 79.666</td>
<td>3 3 3</td>
<td>1.000 1.000 1.000</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water
Tables 20A: Number of eggs laid by *S. litura* and their viability on treated strips / sectors of different plant extracts in combination with Endosulfan (Choice method)

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Treatments plant extracts + Endosulfan (0.035%)</th>
<th>Average number of eggs laid by female</th>
<th>Average number of eggs hatched (Viability)</th>
<th>Average hatching period (Incubation Period)</th>
<th>Oviposition index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Concentration (%)</td>
<td>Concentration (%)</td>
<td>Concentration (%)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>22.33 16.00 9.33</td>
<td>16.33 10.33 5.666</td>
<td>5 6 7</td>
<td>0.283 0.192 0.106</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>24.00 18.00 10.666</td>
<td>18.33 12.33 6.666</td>
<td>4 5 6</td>
<td>0.305 0.216 0.121</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>28.666 21.33 13.000</td>
<td>21.666 15.666 7.666</td>
<td>5 5 5</td>
<td>0.364 0.256 0.148</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>31.000 22.666 15.000</td>
<td>23.000 16.333 9.000</td>
<td>5 5 5</td>
<td>0.394 0.272 0.171</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>26.000 20.666 14.000</td>
<td>21.333 16.333 9.333</td>
<td>5 5 5</td>
<td>0.330 0.248 0.159</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>37.666 29.666 21.666</td>
<td>13.333 23.666 16.333</td>
<td>4 4 4</td>
<td>0.478 0.356 0.247</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>47.666 38.666 29.333</td>
<td>39.333 32.000 22.333</td>
<td>4 4 4</td>
<td>0.605 0.464 0.334</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>31.333 24.666 18.666</td>
<td>24.333 19.000 13.000</td>
<td>4 5 5</td>
<td>0.398 0.296 0.212</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>30.000 23.000 17.000</td>
<td>23.333 17.333 11.333</td>
<td>5 5 5</td>
<td>0.381 0.276 0.193</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>45.333 37.333 29.000</td>
<td>37.000 28.666 21.333</td>
<td>4 4 5</td>
<td>0.576 0.448 0.330</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>78.666 82.333 87.666</td>
<td>73.333 79.000 82.333</td>
<td>3 3 3</td>
<td>1.000 1.000 1.000</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE= fruit extract, BE=bulb extract, DDW=distilled water
Tables 20B: Number of eggs laid by *H. armigera* and their viability on treated strips / sectors of different plant extracts in combination with Endosulfan

(Choice method)

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Treatments plant extracts + Endosulfan (0.035%)</th>
<th>Average number of eggs laid by female</th>
<th>Average number of eggs hatched (Viability)</th>
<th>Average hatching period (in days)</th>
<th>Oviposition index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Concentration (%)</td>
<td>Concentration (%)</td>
<td>Concentration (%)</td>
<td>Concentration (%)</td>
</tr>
<tr>
<td>1</td>
<td>Azadirachta indica (SKE)</td>
<td>26.000</td>
<td>22.000</td>
<td>15.000</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Azadirachta indica (LE)</td>
<td>29.666</td>
<td>24.666</td>
<td>18.666</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Eucalyptus globulus (LE)</td>
<td>45.000</td>
<td>41.000</td>
<td>28.000</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Ageratum conyzoides (LE)</td>
<td>35.333</td>
<td>29.000</td>
<td>21.000</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>Datura alba (FE)</td>
<td>36.333</td>
<td>28.000</td>
<td>20.000</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Nerium indicum (LE)</td>
<td>54.666</td>
<td>42.000</td>
<td>29.666</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Parthenium hysterophorus (LE)</td>
<td>67.333</td>
<td>58.000</td>
<td>44.333</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>Lantana camara (LE)</td>
<td>38.333</td>
<td>35.000</td>
<td>24.000</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>Calotropis procera (LE)</td>
<td>41.666</td>
<td>34.333</td>
<td>22.333</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>Allium sativum (BE)</td>
<td>57.000</td>
<td>43.333</td>
<td>28.333</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>82.666</td>
<td>80.666</td>
<td>77.333</td>
<td>3</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE= fruit extract, BE=bulb extract, DDW=distilled water
Table 21 A. Effect of various plant extracts on the feeding activity of *S. litura* larva.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Treatments</th>
<th>Mean feeding area (cm²) (±SEM)</th>
<th>Preference index (C-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em></td>
<td>2.733 (±0.303)</td>
<td>0.577</td>
</tr>
<tr>
<td></td>
<td>(SKE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em></td>
<td>3.266 (±0.303)</td>
<td>0.653</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em></td>
<td>3.733 (±0.217)</td>
<td>0.713</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em></td>
<td>3.333 (±0.272)</td>
<td>0.662</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em></td>
<td>5.700 (±0.286)</td>
<td>0.916</td>
</tr>
<tr>
<td></td>
<td>(FE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em></td>
<td>3.500 (±0.235)</td>
<td>0.684</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em></td>
<td>4.933 (±0.474)</td>
<td>0.845</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em></td>
<td>5.166 (±0.593)</td>
<td>0.868</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em></td>
<td>2.800 (±0.377)</td>
<td>0.587</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em></td>
<td>5.733 (±0.303)</td>
<td>0.919</td>
</tr>
<tr>
<td></td>
<td>(BE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Control</td>
<td>6.733 (±0.303)</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>(DDW)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)
Table 21 B. Effect of various plant extracts on the feeding activity of *H. armigera* larva.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Treatments Plant extract concentrations (2%)</th>
<th>Mean feeding area (cm²) (±SEM)</th>
<th>Preference index (C-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>5.333 (±0.272)</td>
<td>0.879</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>5.166 (±0.136)</td>
<td>0.863</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>4.933 (±0.190)</td>
<td>0.840</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>6.233 (±0.118)</td>
<td>0.956</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>6.366 (±0.259)</td>
<td>0.967</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>5.833 (±0.360)</td>
<td>0.923</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>6.433 (±0.190)</td>
<td>0.972</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>5.233 (±0.232)</td>
<td>0.869</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>5.666 (±0.272)</td>
<td>0.909</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>5.300 (±0.286)</td>
<td>0.876</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>6.800 (±0.339)</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water.
Values in parentheses are standard error of mean (±S.E.M.)
Table 22A. Effect of various plant extracts in combination with monocrotophos on the feeding activity of *S. litura* larva.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Treatments</th>
<th>Mean feeding area (cm$^2$) (±SEM)</th>
<th>Preference index (C-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>1.400 (±0.169)</td>
<td>0.353</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>1.333 (±0.144)</td>
<td>0.339</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>2.333 (±0.136)</td>
<td>0.526</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>2.000 (±0.235)</td>
<td>0.468</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>2.163 (±0.180)</td>
<td>0.497</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>2.133 (±0.151)</td>
<td>0.492</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>2.400 (±0.169)</td>
<td>0.537</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>1.533 (±0.217)</td>
<td>0.380</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>1.666 (±0.136)</td>
<td>0.406</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>2.233 (±0.054)</td>
<td>0.509</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>6.533 (±0.212)</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)
Table 22B. Effect of various plant extracts in combination with monocrotophos on the feeding activity of *H. armigera* larva.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Treatments</th>
<th>Plant extract concentrations (2%)</th>
<th>Mean feeding area (cm$^2$) (±SEM)</th>
<th>Preference index (C-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em></td>
<td>SKE</td>
<td>1.266 (±0.217)</td>
<td>0.299</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em></td>
<td>LE</td>
<td>1.600 (±0.244)</td>
<td>0.363</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em></td>
<td>LE</td>
<td>1.900 (±0.047)</td>
<td>0.417</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em></td>
<td>LE</td>
<td>1.916 (±0.183)</td>
<td>0.420</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em></td>
<td>FE</td>
<td>2.033 (±0.072)</td>
<td>0.440</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em></td>
<td>LE</td>
<td>2.043 (±0.126)</td>
<td>0.442</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em></td>
<td>LE</td>
<td>2.333 (±0.136)</td>
<td>0.489</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em></td>
<td>LE</td>
<td>1.520 (±0.071)</td>
<td>0.348</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em></td>
<td>LE</td>
<td>1.730 (±0.053)</td>
<td>0.387</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em></td>
<td>BE</td>
<td>2.800 (±0.124)</td>
<td>0.560</td>
</tr>
<tr>
<td>11</td>
<td>Control</td>
<td>(DDW)</td>
<td>7.200 (±0.141)</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water
Values in parentheses are standard error of mean (±S.E.M.)
Table 23 A. Effect of various plant extracts in combination with endosulfan on the feeding activity of *S. litura* larva.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Treatments</th>
<th>Plant extract concentrations (2%)</th>
<th>Mean feeding area (cm²) (±SEM)</th>
<th>Preference index (C-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td></td>
<td>1.333 (±0.136)</td>
<td>0.337</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td></td>
<td>1.866 (±0.072)</td>
<td>0.442</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td></td>
<td>1.833 (±0.072)</td>
<td>0.436</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td></td>
<td>2.200 (±0.124)</td>
<td>0.501</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td></td>
<td>2.366 (±0.151)</td>
<td>0.529</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td></td>
<td>2.366 (±0.190)</td>
<td>0.529</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td></td>
<td>2.566 (±0.284)</td>
<td>0.562</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td></td>
<td>2.333 (±0.136)</td>
<td>0.524</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td></td>
<td>2.433 (±0.190)</td>
<td>0.540</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td></td>
<td>2.366 (±0.165)</td>
<td>0.509</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td></td>
<td>6.566 (±0.222)</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)
Table 23B. Effect of various plant extracts in combination with endosulfan on the feeding activity of *H. armigera* larva.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Treatments</th>
<th>Plant extract concentrations (2%)</th>
<th>Mean feeding area (cm²) (±SEM)</th>
<th>Preference index (C-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td></td>
<td>1.333 (±0.272)</td>
<td>0.333</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td></td>
<td>1.633 (±0.259)</td>
<td>0.393</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td></td>
<td>1.766 (±0.320)</td>
<td>0.419</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td></td>
<td>2.100 (±0.169)</td>
<td>0.479</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td></td>
<td>2.166 (±0.136)</td>
<td>0.490</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td></td>
<td>2.400 (±0.169)</td>
<td>0.529</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td></td>
<td>2.733 (±0.118)</td>
<td>0.581</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td></td>
<td>1.800 (±0.169)</td>
<td>0.425</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td></td>
<td>2.050 (±0.154)</td>
<td>0.470</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td></td>
<td>2.333 (±0.136)</td>
<td>0.518</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td></td>
<td>6.667 (±0.360)</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water

Values in parentheses are standard error of mean (±S.E.M.)
Table 24 A. Effect of plant extracts on growth and development of *Spodoptera litura*

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Treatment Plant Extracts</th>
<th>Larval period (days)</th>
<th>Pupal days (days)</th>
<th>Per cent Pupation</th>
<th>Normal adult emergence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>13.67</td>
<td>7.00</td>
<td>86.67</td>
<td>33.33</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>15.00</td>
<td>8.00</td>
<td>100.00</td>
<td>40.00</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>13.33</td>
<td>7.00</td>
<td>93.33</td>
<td>66.67</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>11.33</td>
<td>8.67</td>
<td>100.00</td>
<td>80.00</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>14.33</td>
<td>9.00</td>
<td>80.00</td>
<td>66.66</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>16.33</td>
<td>7.00</td>
<td>100.00</td>
<td>46.67</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>16.00</td>
<td>10.33</td>
<td>93.33</td>
<td>40.00</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>14.33</td>
<td>7.33</td>
<td>86.67</td>
<td>60.00</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>17.00</td>
<td>7.00</td>
<td>100.00</td>
<td>40.00</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>17.00</td>
<td>6.33</td>
<td>93.33</td>
<td>66.67</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>15.00</td>
<td>8.67</td>
<td>100.00</td>
<td>93.33</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water
Table 24 B. Effect of plant extracts on deformities in *Spodoptera litura*

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Treatment</th>
<th>Number of larval-pupal intermediates</th>
<th>Number of deformed adults</th>
<th>Total deformity</th>
<th>Per cent total deformities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>0.33</td>
<td>0.33</td>
<td>0.67</td>
<td>13.00</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>0.00</td>
<td>1.00</td>
<td>1.00</td>
<td>20.00</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>0.00</td>
<td>0.67</td>
<td>0.67</td>
<td>13.33</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE= fruit extract, BE=bulb extract, DDW=distilled water
Table 24 C. Effect of plant extracts on fecundity, hatching and incubation period of *Spodoptera litura*

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Treatment Plant Extracts</th>
<th>Fecundity (eggs/♀)</th>
<th>Number of eggs hatched</th>
<th>Per cent hatching</th>
<th>Incubation period (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>193.33</td>
<td>159.33</td>
<td>82.19</td>
<td>4.67</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>189.33</td>
<td>185.67</td>
<td>98.18</td>
<td>4.60</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>240.80</td>
<td>239.33</td>
<td>99.67</td>
<td>4.33</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water
Table 25 A. Effect of plant extracts on growth and development of *Helicoverpa armigera*

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Treatment Plant Extracts</th>
<th>Larval period (days)</th>
<th>Pupal days (days)</th>
<th>Per cent Pupation</th>
<th>Normal adult emergence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>18.33</td>
<td>11.00</td>
<td>80.00</td>
<td>13.33</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>18.67</td>
<td>19.33</td>
<td>73.33</td>
<td>20.00</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>19.33</td>
<td>12.67</td>
<td>80.00</td>
<td>40.00</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>17.00</td>
<td>7.00</td>
<td>80.00</td>
<td>60.00</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>16.3</td>
<td>8.67</td>
<td>93.33</td>
<td>0.00</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>14.33</td>
<td>9.67</td>
<td>100.00</td>
<td>66.67</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>17.00</td>
<td>12.33</td>
<td>100.00</td>
<td>80.00</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>15.67</td>
<td>6.33</td>
<td>100.00</td>
<td>26.66</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>16.33</td>
<td>6.00</td>
<td>86.67</td>
<td>33.33</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>14.67</td>
<td>10.33</td>
<td>93.33</td>
<td>40.00</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>17.00</td>
<td>7.00</td>
<td>100.00</td>
<td>90.00</td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water
<table>
<thead>
<tr>
<th>S.No.</th>
<th>Treatment Plant Extracts</th>
<th>Number of larval – pupal intermediates</th>
<th>Number of deformed adults</th>
<th>Total deformity</th>
<th>Per cent total deformities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em> (SKE)</td>
<td>0.00</td>
<td>1.00</td>
<td>1.00</td>
<td>20.00</td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em> (LE)</td>
<td>1.00</td>
<td>0.67</td>
<td>1.67</td>
<td>33.33</td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em> (LE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em> (LE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em> (FE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em> (LE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em> (LE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em> (LE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em> (LE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em> (BE)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>11</td>
<td>Control (DDW)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Where, SKE = seed kernel extract, LE = leaf extract, FE = fruit extract, BE = bulb extract, DDW = distilled water
Table 25 C. Effect of plant extracts on fecundity, hatching and incubation period of *Spodoptera litura*

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Treatment Plant Extracts</th>
<th>Fecundity (eggs/♀)</th>
<th>Number of eggs hatched</th>
<th>Per cent hatching</th>
<th>Incubation period (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Azadirachta indica</em></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>(SKE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td><em>Azadirachta indica</em></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td><em>Eucalyptus globulus</em></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td><em>Ageratum conyzoides</em></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td><em>Datura alba</em></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>(FE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td><em>Nerium indicum</em></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td><em>Parthenium hysterophorus</em></td>
<td>204.67</td>
<td>192.67</td>
<td>94.66</td>
<td>4.00</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td><em>Lantana camara</em></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td><em>Calotropis procera</em></td>
<td>165.33</td>
<td>160.33</td>
<td>64.57</td>
<td>4.67</td>
</tr>
<tr>
<td></td>
<td>(LE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td><em>Allium sativum</em></td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>(BE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Control</td>
<td>240.80</td>
<td>239.33</td>
<td>99.67</td>
<td>4.33</td>
</tr>
<tr>
<td></td>
<td>(DDW)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Where, SKE=seed kernel extract, LE=leaf extract, FE=fruit extract, BE=bulb extract, DDW=distilled water
Fig. 3A. Regression graphs showing Mortality of *Spodoptura litura* larvae against various concentrations of plant extracts.
Fig. 3B. Regression graphs showing Mortality of *Helicoverpa armigera* larvae against various concentrations of plant extracts.
Fig. 4A. Regression graphs showing Mortality of *Spodoptera litura* eggs against various concentrations of plant extracts.
Fig. 4B. Regression graphs showing Mortality of Helicoverpa armigera eggs against various concentrations of plant extracts.
Fig. 5. Bar diagrams showing the corresponding change in the correlation values plotted between the mean mortality of insects/eggs at different treatment durations and various concentrations of (A) plant extracts, (B) plant extracts in combination with monocrotophos and (C) plant extracts in combination with endosulfan.

S.I. = *Spodoptera litura*; H.a. = *Heliothis armigera*

(All the r-values were highly significant at 5% level)
Fig. 6A. *Spodoptera litura*. Comparative graphical representation of number of eggs laid and hatched at 2, 5 and 10 percent concentrations of various plant extracts.
Fig. 6B. *Spodoptera litura*. Comparative graphical representation of number of eggs laid and hatched at 1, 2.5 and 5 percent concentrations of various plant extracts in combination with monocrotophos (0.02%).
Fig. 6C. *Spodoptera litura*. Comparative graphical representation of number of eggs laid and hatched at 1, 2.5 and 5 percent concentrations of various plant extracts in combination with endosulfan (0.035%).
Fig. 7. Comparative graphical representation of the incubation period of *Spodoptera litura* eggs on various treatments:
A. Plant extracts (2%, 5% and 10%)
B. Plant extracts (1%, 2.5% and 5%) + Monocrotophos (0.02%)
C. Plant extracts (1%, 2.5% and 5%) + Endosulfan (0.035%)
Fig. 8A. *Helicoverpa armigera*. Comparative graphical representation of number of eggs laid and hatched at 2, 5 and 10 percent concentrations of various plant extracts.
Fig. 8B. *Helicoverpa armigera*. Comparative graphical representation of number of eggs laid and hatched at 1, 2.5 and 5 percent concentrations of various plant extracts in combination with monocrotophos (0.02%).
Fig. 8C. *Helicoverpa armigera*. Comparative graphical representation of number of eggs laid and hatched at 1, 2.5 and 5 percent concentrations of various plant extracts in combination with endosulfan (0.035%).
Fig. 9. Comparative graphical representation of the incubation period of *Helicoverpa armigera* eggs on various treatments:

A. Plant extracts (2%, 5% and 10%)

B. Plant extracts (1%, 2.5% and 5%) + Monocrotophos (0.02%)

C. Plant extracts (1%, 2.5% and 5%) + Endosulfan (0.035%)
Fig. 10. Pie chart showing the percent transformed feeding area by *S. litura* larvae

A. In the presence of plant extracts alone

B. In the presence of plant extracts and monocrotophos

C. In the presence of plant extracts and endosulfan
Fig. 11. Pie chart showing the percent transformed feeding area by *H. armigera* larvae

A. In the presence of plant extracts alone

B. In the presence of plant extracts and monocrotophos

C. In the presence of plant extracts and endosulfan