Management of *Corcyra cephalonica* Stain. by botanicals and its effect of infestation on stored sesamum seeds

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**Abstract**

Eight plant products, viz. neem leaf powder, NSK powder, curry leaf powder, custard apple leaf powder, citrus peel powder, turmeric powder, begonia leaf powder and karanj leaf powder, each @ 5 g/kg seeds were used for management study of *Corcyra cephalonica* on two sesamum varieties (Smarak and Amrit). Highest larval mortality, pupal mortality and minimum adult emergence were recorded on seeds treated with NSK powder up to a tune of 81.67%, 8.33% and 10.00% as compared to 5.00%, 0% and 95.00% in control in Smarak whereas 83.33%, 6.67% and 10.00% with respect to 6.67%, 0% and 93.33% in control in Amrit respectively. NSK powder treated sesamum seeds showed highest germination of 91.67% in Smarak and 92.00% in Amrit. Per cent adult emergence of *Corcyra cephalonica* and weight loss of seeds were recorded on three sesamum varieties, viz. Smarak (white), Amrit (brown) and Prachi (black) after two months of infestation. Variety Prachi showed minimum infestation by *Corcyra cephalonica* exhibiting lowest adult emergence (36.67%) with highest phenol (2.72 mg/g) and protein (17.10%) content as compared to variety Smarak (93.67%), where phenol and protein content was 1.30 mg/g and 13.74%, respectively. In Amrit, the adult emerged was recorded 85.33%.

**Keywords:** *Corcyra cephalonica*, management, botanicals, sesamum seeds, varieties

**Introduction**

Sesamum (*Sesamum indicum*) is an ancient oilseed crop, regarded as “queen of oilseeds”, cultivated throughout the tropical and subtropical regions of the world. Sesamum seeds are rich source of fatty acids like oleic acid (40-50%) and linoleic acid (35-45%), protein, mineral ash, crude fibre, oxalates, soluble carbohydrates and vitamins like A, E and B complex including calcium and phosphorus (Annual report 2014-15, Dept. of Agriculture, Cooperation and Farmers Welfare, GOI). India is the 5th largest producer of sesame in the world. The crop is grown in an area of 17.78 lakh hectares with an annual production of 0.67 million tonnes in India (Annual report 2016-17, Dept. of Agriculture, Cooperation and Farmers Welfare, GOI). Sesame occupies 2nd position after groundnut as far as export of oilseeds is concerned. In Odisha, sesamum is grown over an area of about 212.85 thousand hectares and the annual production is around 0.55 lakh tonnes (Annual report 2015-16, Directorate of Agriculture and Food Production, Odisha). In the state, sesame varieties like Nirmala, Prachi, Amrit, Subhra and Smarak are grown mainly in the districts like Ganjam, Malkangiri, Sundargarh, Sambalpur, Dhenkanal, Angul and Bolangir (Pathaik et al., 2013) [11].

According to the report of All India Coordinated Research Project (AICRP) on sesamum and niger (2013-14), rice moth (*Corcyra cephalonica*) and red flour beetle (*Tribolium castaneum*) were found to be the most serious pests of sesamum in storage. *C. cephalonica* causes a great loss to stored sesame seeds by feeding. In case of higher infestation, the entire seed stock is converted into a black webbed mass that emits a characteristic foul smell and becomes unfit for human consumption (Wadaskar et al., 2016) [13]. Qualitative loss leads to reduction in seed vigour and germination percentage. A loss in germinability of sesame seed up to 95% was noticed which seems to be a major threat to the farmer (Kumar, 2012) [9].

In storage, use of botanicals is eco-friendly and these are easily available, low cost alternatives to the hazardous synthetic chemical pesticides for pest management and they reportedly pose no harm to the environment and human health. In the present study, botanicals like neem leaf,
neem seed, curry leaf, custard apple leaf, citrus leaf, begonia leaf, karanj leaf and turmeric powder are used to determine the best protection of sesamum seeds against storage pests.

**Materials and Methods**

Laboratory experiments were conducted to study the management of *Corcyra cephalonica* on sesamum varieties during the year 2018-19 in the Department of Entomology, Odisha University of Agriculture and Technology (OUAT), Bhubaneswar, Odisha. Several seed quality parameters like protein content, phenol content, oil content, seed germination and vigour on both uninsected and infested sesame seeds at pre- and post-experimental periods were also estimated.

Eggs of *Corcyra cephalonica* were collected from the Biocontrol Laboratory of Department of Entomology and were mass-cultured by spreading 0.2 cc eggs of rice moth in one kg of broken sesame seeds in a plastic jar (25 cm long x 10 cm diameter). Three cultures were prepared on three sesame varieties (Smarak, Amrit and Prachi). All jars were covered with muslin cloth and tied with rubber band. Regular observation of moth emergence was done. Adults obtained from the culture were released in egg laying apparatus that was made with a plastic funnel (18 cm long x 13 cm diameter), with the lower side fitted with a wire gauge (60 mm mesh) and eggs were collected beneath on a glass plate on which the apparatus was placed. Collected eggs were further released into jars containing sesame seeds and a series of culture also maintained to obtain sufficient adults for further investigation.

In both infested and uninsected seeds, total protein and oil content was estimated by Lowry’s method (Lowry et al., 1951) [10] and Soxhlet extraction method (Sadasivam and Manickam, 1992) [12] respectively. Total phenol content was estimated by the method as described by Bray and Thorpe (1954) [9]. The laboratory test for germination of sesame seed was conducted as per the ISTA rules by adopting top of paper method. Four hundred seeds from each treatment were placed in petri dishes containing moistened blotting paper and covered with lid to maintain the moisture or prevent evaporation. Petri dishes were kept in the germinator maintained at constant temperature of 25±1°C and relative humidity of 95%. The first count was taken after three days and final count after six days. On the day of final count, the number of normal seedlings was counted and the per cent germination was calculated as follows:

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\text{Germination (\%)} = \frac{\text{Number of normal seedlings}}{\text{Total number of seeds}} \times 100
\]

Twenty normal seedlings were randomly selected in each treatment from all the replications on the final count day of germination test. The seedling length was measured for the twenty seedlings and their mean calculated in centimetres. The dry weight of twenty seedlings was taken using an electronic balance and the dry weight per seedling was calculated and expressed in grams. The seed vigour indices were calculated as per the following formulae suggested by Abdul-Baki and Anderson (1973) [1],

Seed vigour index-I = Seed germination (%) \times Mean seedling length (cm)

Seed vigour index-II = Seed germination (%) \times Mean seedling dry weight (g)

The observations recorded in various experiments were subjected to appropriate transformation and data analysis was carried out as per the standard procedures (Gomez and Gomez, 1984) [6].

**Result and Discussion**

Per cent adult emerged and weight loss of seeds from three sesamum varieties, viz. Smarak (white), Amrit (brown) and Prachi (black) after 2 months of infestation was recorded (Table 2). It is evident from the table that highest adult emerged from variety Smarak was 93.67% and the lowest emergence was found in variety Prachi (36.67%). In Amrit,
the adult emerged was recorded 85.33%. These findings are in close agreement with the observation taken by Kumar (2012) [9]. Highest weight loss of 20.51% was found in the variety Smarak and the lowest of 5.11% was recorded in Prachi. In case of Amrit the weight loss was 18.85%.

Table 2: Varietal seed characters of sesame cultivars and adult emergence of Corcyra cephalonica Stain

| Varieties | Colour | No. of adult emerged (%) | Weight loss of seeds (%) |
|-----------|--------|--------------------------|--------------------------|
| Smarak    | White  | 93.67 (76.60)**          | 20.51 (4.52)**           |
| Amrit     | Brown  | 85.33 (67.66)**          | 18.85 (4.33)**           |
| Prachi    | Black  | 36.67 (37.24)**          | 5.11 (2.20)**            |

S.E.m(±) 1.075 0.093 C.D.(0.05) 4.10 0.35

*Mean of 15 replications
** figures in parentheses are square root transformed values
** figures in parentheses are angular transformed values

Effect of plant products on survival of rice moth Corcyra cephalonica Stain.

To find out the relative efficacy of the plant products from Corcyra cephalonica attack, products of eight plant species including neem leaf powder, NSK powderum, curry leaf powder, custard apple leaf powder, citrus peel powder, turmeric powder, begunia and karanj leaf powder (at a rate of 5g/kg seeds) were thoroughly mixed with sesame seeds and 1st instar larva of C. cephalonica were released and kept for differential storage period. Effect of these products on larval mortality, pupal mortality and adult emergence were recorded.

Volatile mortality, adult emergence of Corcyra cephalonica Stain, and weight loss of sesame seeds on variety Smarak

On variety Smarak, the mortality of 1st instar larva C. cephalonica varied from zero to 50.00% among the treatments at 5 DAT with maximum mortality of 50.00% found in NSK powder treatment followed by 43.33% in T1. At 10 DAT, the lowest larval mortality was recorded in control, i.e. 1.67%, while highest mortality of larva was recorded 61.87% in NSK powder treatment (T2), which was at par with neem leaf powder (T1). Among the botanicals used, lowest mortality recorded in T6 was 11.67%, where the seeds were treated with turmeric powder. At 15 DAT, larval mortality varied from 3.33% to 76.67% among the treatments with lowest larval mortality 13.33% was recorded among the botanicals in T6 where turmeric powder was used. At 30 DAT, maximum mortality 81.67% was found in NSK powder treatment (T2) followed by neem leaf powder (78.33%) as compared to control (T6), where mortality was only 5%. The karanj leaf powder, custard apple leaf powder and begunia leaf powder treatments were the next best treatments showing larval mortality of 71.67%, 66.67% and 60.00%, respectively (Table 3). These findings are fully corroborated with observations of Jhala et al. (2018) [9].

Maximum Pupal mortality of 8.33% was found both in neem leaf powder (T1) and NSK powder (T2), with a minimum of 0% in curry leaf powder (T1), citrus peel powder (T3), turmeric leaf powder (T4) and control (T6). In T2 and T6, seeds treated with begunia and karanj leaf powder, pupal mortality of 1.67% and 6.67%, respectively, were recorded (Table 4). These findings are in close agreement with the findings of Kumar et al. (2012) [9]. Adult emergence varied from 10.00% in NSK powder treatment (T2) to 95.00% in control (T6) (Table 4). Maximum adult emergence among botanical treatments was noticed in turmeric powder (T2) (83.33%) followed by in citrus peel powder (T6) (70.00%). Present studies are in conformity with the findings of Kumar et al. (2012) [9], who reported the lowest number of moth emergence was 15.33% and highest was 68.66% on sesame seed treated with neem seed powder and turmeric powder, respectively.

Weight loss per cent of treated seeds was determined after two months of treatment. The initial weight of seeds in each treatment was recorded before the larval infestation. Data presented in Table 4 revealed that there is a significant difference in all the treatments as compared to control. Among the botanicals used, highest weight loss per cent was found in turmeric powder (T6) was 18.23%, followed by citrus peel powder (T3) (15.06%). The weight loss per cent in T2 (12.74%), T7 (10.42%), T4 (9.65%), T5 (8.88%) and T1 (7.34%), were recorded. The present findings are supported by the results of Kumar et al. (2012) [9] who reported the lowest weight loss per cent of 6.3% in neem seed powder treatment against 35.6% in control due to Corcyra cephalonica infestation in sesame seeds.

![Image](image-url)
Similar trends were observed during 15, 20 and 25 DAT.

Mean followed by similar letters in a column are not significantly different

** Figures in parentheses are angular transformed values

Table 4: Relative efficacy of different plant products on the pupal mortality, adult emergence and weight loss of sesamum seeds (variety Smarak)

| Tr. No. | Treatment                          | Dose (g/kg of seeds) | Pupal mortality (%) | Adult emergence (%) | Weight loss of seeds (%) after 2 months |
|---------|------------------------------------|----------------------|---------------------|---------------------|----------------------------------------|
| T1      | Neem leaf powder                   | 5.00                 | 13.33 (21.34)**    | 7.34 (2.71)**       | 6.56 (2.56)**                          |
| T2      | NSK powder                         | 5.00                 | 10.00 (18.05)      | 12.74 (3.57)**      | 9.65 (3.11)**                          |
| T3      | Curry leaf powder                  | 5.00                 | 63.33 (52.74)     | 15.06 (3.88)**      | 18.23 (4.27)**                         |
| T4      | Custard apple leaf powder          | 5.00                 | 26.67 (31.07)     | 10.42 (3.23)**      | 10.42 (3.23)**                         |
| T5      | Citrus peel powder                 | 5.00                 | 70.00 (56.84)     | 8.88 (2.89)**       | 19.30 (4.39)**                         |
| T6      | Turmeric powder                    | 5.00                 | 83.33 (65.95)     | 0.02                | 0.02                                   |
| T7      | Begunia leaf powder                | 5.00                 | 38.33 (38.19)*    | 0.02                | 0.02                                   |
| T8      | Karanj leaf powder                 | 5.00                 | 21.67 (27.60)*    | 0.02                | 0.02                                   |
| T9      | Control                            | 0.00                 | 95.00 (77.08)*    | 4.69                | 4.69                                   |

C.D.(0.05)  4.48  5.60  5.75  3.38  3.95  4.69

Table 3: Relative efficacy of different plant products on larval mortality of Coreya cephalonica Stain. (variety Smarak)

| Tr. No. | Treatments                          | Dose (g/kg of seeds) | Mortality of larvae (%) | 5 DAT* | 10 DAT* | 15 DAT* | 20 DAT* | 25 DAT* | 30 DAT* | 35 DAT* |
|---------|-------------------------------------|----------------------|-------------------------|--------|--------|--------|--------|--------|--------|--------|
| T1      | Neem leaf powder                     | 5.00                 | 33.33 (52.74)           | 36.67  | 43.33  | 50.00  | 56.67  | 63.33  | 70.00  | 76.67  |
| T2      | NSK powder                           | 5.00                 | 13.33 (21.34)**         | 18.33  | 25.31  | 32.88  | 39.21  | 46.00  | 52.74  | 59.25  |
| T3      | Curry leaf powder                    | 5.00                 | 41.66 (65.95)           | 48.84  | 56.00  | 63.33  | 70.84  | 78.33  | 85.84  | 93.33  |
| T4      | Custard apple leaf powder            | 5.00                 | 65.00 (53.73)**         | 53.73  | 61.67  | 69.33  | 77.00  | 84.67  | 92.33  | 100.00 |
| T5      | Citrus peel powder                   | 5.00                 | 18.33 (25.31)           | 25.31  | 32.88  | 40.00  | 47.33  | 54.67  | 62.00  | 69.33  |
| T6      | Turmeric powder                      | 5.00                 | 26.67 (31.07)           | 31.07  | 38.08  | 45.00  | 52.00  | 59.00  | 66.00  | 73.33  |
| T7      | Begunia leaf powder                  | 5.00                 | 63.33 (52.74)           | 52.74  | 59.24  | 66.67  | 74.17  | 81.67  | 89.17  | 96.67  |
| T8      | Karanj leaf powder                   | 5.00                 | 80.00 (65.95)           | 65.95  | 73.33  | 80.67  | 88.00  | 95.33  | 102.67 | 110.00 |
| T9      | Control                              | 0.00                 | 0.00 (0.64)             | 0.64   | 1.25   | 1.93   | 2.64   | 3.33   | 4.02   | 4.73   |

C.D.(0.05)  4.48  5.60  5.75  3.38  3.95  4.69

*Mean of three replications

** Figures in parentheses are angular transformed values

Mean followed by similar letters in a column are not significantly different

Larval mortality, adult emergence of Coreya cephalonica Stain. and weight loss of sesamum seeds on variety Amrit

On 5 DAT the mortality of 1st instar larva of C. cephalonica was found to be maximum in NSK powder treatment (43.3%) followed by 38.33% in T1 where the seeds were treated with neem leaf powder. In control minimum larval mortality was found (1.67%). On the 10 DAT, the lowest larval mortality recorded in control was 5.00%. The highest mortality of larva was recorded 58.33% in NSK powder (T2) followed by neem leaf powder (T1) was 48.33%. Similar trends were observed during 15, 20 and 25 DAT.

Observation on 30 DAT revealed that, the maximum mortality of 83.33% was found in NSK powder treatment (T2) followed by neem leaf powder in (T1) was 75.00% and in control only 6.67% mortality was found. In treatments karanj leaf powder (T8), custard apple leaf powder (T4) the larval mortality was found to be 65.00% each followed by in begunia leaf powder (T7) was the next best treatments showing 58.33% larval mortality (Table 5). These findings are in close agreement with the findings of Jhala et al. (2018) [8].

Maximum pupal mortality mortality of (6.67%) was found in neem leaf powder (T1), NSK powder (T2) and karanj leaf powder (T8) followed by neem leaf powder in (T1) was 75.00% and in control only 6.67% mortality was found. In treatments karanj leaf powder (T8), custard apple leaf powder (T4) the larval mortality was found to be 65.00% each followed by in begunia leaf powder (T7) was the next best treatments showing 58.33% larval mortality (Table 5). These findings are in close agreement with the findings of Jhala et al. (2018) [8].

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No pupal mortality was noticed in case of curry leaf powder (T5), citrus peel powder (T3), turmeric leaf powder (T6) and in control (T0).

In both T7 and T4 where the seeds were treated with beguния and custard apple leaf powder respectively, the pupal mortality was hardly 3.33% (Table 6). These findings are supported by Jhala et al. (2018) [8].

Adult emergence varied from 10.00% (T2) to 93.33% (T5) among the treatments. The maximum per cent of adult emergence was noticed in turmeric powder (T6) was 85.00% followed by in citrus peel powder (T3) and curry leaf powder (T3) were 71.67% and 63.33% respectively. The lowest adult emergence recorded in NSK powder treatment (T2) was only 10.00% (Table 6). Present studies are in conformity with the findings of Kumar et al. (2012) [9].

Among the treatments, the weight loss percentage varied from 6.46% in NSK powder treatment (T2) to 19.01% in control (T0). The highest weight loss per cent of 18.01% was seen in T6 (turmeric powder) followed by citrus peel powder (T3) was 14.89%. In T5, T7, T4, T5 and T1 the weight loss per cent was 12.00%, 10.34%, 9.00%, 7.90% and 7.28% were recorded in curry leaf powder, beguния leaf powder, custard apple leaf powder, karanj leaf powder and neem leaf powder treatments respectively (Table 6). All these findings are supported by Jhala et al. (2018) [8] and Kumar et al. (2012) [9].

Table 5: Relative efficacy of different plant products on larval mortality of Corcyra cephalonica Stain. (variety Amrit)

| Tr. No. | Treatment       | Dose (g/kg of seeds) | Mortality of larvae (%) | S.E.(±) |
|---------|-----------------|----------------------|-------------------------|---------|
|         |                 |                      | 5DAT* | 10DAT* | 1SDAT* | 20DAT* | 25DAT* | 30DAT* | 35DAT* |
| T1      | Neem leaf powder| 5.00                 | 38.33 (38.24)* | 48.38 (44.04)* | 65.00 (53.76)* | 71.67 (57.91)* | 73.33 (58.93)* | 75.00 (60.00)* | 75.00 (60.00)* |
| T2      | NSK powder      | 5.00                 | 43.33 (41.16)* | 58.33 (49.83)* | 76.67 (61.14)* | 76.67 (61.14)* | 78.33 (62.29)* | 83.33 (65.95)* | 83.33 (65.95)* |
| T3      | Curry leaf powder| 5.00               | 20.00 (26.45)* | 25.00 (29.93)* | 28.33 (32.09)* | 30.00 (33.16)* | 33.33 (35.25)* | 36.67 (37.26)* | 36.67 (37.26)* |
| T4      | Custard apple leaf powder | 5.00 | 33.33 (35.25)* | 38.33 (38.24)* | 46.67 (43.09)* | 56.67 (48.84)* | 63.33 (52.74)* | 65.00 (53.73)* | 65.00 (53.73)* |
| T5      | Citrus peel powder| 5.00              | 10.00 (18.05)* | 16.67 (24.05)* | 26.67 (31.07)* | 26.67 (31.07)* | 28.33 (32.09)* | 28.33 (32.09)* | 28.33 (32.09)* |
| T6      | Turmeric powder | 5.00                | 6.67 (14.76)* | 10.00 (18.43)* | 11.67 (19.89)* | 13.33 (21.34)* | 15.00 (22.79)* | 15.00 (22.79)* | 15.00 (22.79)* |
| T7      | Beguния leaf powder| 5.00       | 33.33 (35.25)* | 36.67 (37.26)* | 48.33 (44.04)* | 50.00 (45.00)* | 56.67 (48.87)* | 58.33 (49.80)* | 58.33 (49.80)* |
| T8      | Karanj leaf powder| 5.00             | 35.00 (36.27)* | 43.33 (41.16)* | 60.00 (50.79)* | 60.00 (50.79)* | 63.33 (52.74)* | 65.00 (53.73)* | 65.00 (53.73)* |
| T9      | Control         | 5.00                | 1.67 (4.73)* | 5.00 (4.73)* | 5.00 (10.67)* | 6.67 (14.76)* | 6.67 (14.76)* | 6.67 (14.76)* | 6.67 (14.76)* |
|         | S.E.(±)         |                      | 2.017 | 2.193 | 2.219 | 1.467 | 1.483 | 1.259 | 1.259 |
|         | C.D.(0.05)      |                      | 5.99  | 6.52  | 6.59  | 4.36  | 4.41  | 3.74  | 3.74  |

*Mean of three replications

Table 6: Relative efficacy of different plant products on the pupal mortality, adult emergence and weight loss of sesamum seeds (variety Amrit)

| Tr. No. | Treatment       | Dose (g/kg of seeds) | Pupal mortality (%) | Adult emergence (%) | Weight loss of seeds (%) after 2 months |
|---------|-----------------|----------------------|---------------------|---------------------|----------------------------------------|
| T1      | Neem leaf powder| 5.00                 | 6.67 (2.64)* **     | 18.33 (25.31)*     | 7.28 (2.70)* **                        |
| T2      | NSK powder      | 5.00                 | 6.67 (2.64)* **     | 10.00 (18.43)*     | 12.00 (3.46)* **                       |
| T3      | Curry leaf powder| 5.00               | 0.00 (0.71)* **     | 63.33 (52.74)*     | 9.00 (3.00)* **                        |
| T4      | Custard apple leaf powder | 5.00 | 3.33 (1.80)* **     | 31.67 (34.23)*     | 14.89 (3.86)* **                      |
| T5      | Citrus peel powder| 5.00              | 0.00 (0.71)* **     | 71.67 (57.91)*     | 18.01 (4.24)* **                      |
| T6      | Turmeric powder | 5.00                | 3.33 (1.80)* **     | 38.33 (38.22)*     | 10.34 (3.22)* **                      |
| T7      | Beguния leaf powder| 5.00       | 0.00 (0.71)* **     | 85.00 (67.21)*     | 7.90 (2.81)* **                       |
| T8      | Karanj leaf powder| 5.00             | 6.67 (2.64)* **     | 28.33 (32.09)*     | 19.01 (4.36)* **                      |
| T9      | Control         | 5.00                | 0.310              | 1.473              | 6.03                                    |
|         | S.E.(±)         |                      | 0.92               | 4.38               | 0.10                                    |

*Mean of three replications

*Figures in parentheses are angular transformed values

** Figures in parentheses are (√x + 0.5) transformed values

Mean followed by similar letters in a column are not significantly different
Effect of infestation of *Corcyra cephalonica* on seed quality parameters of sesame seeds (variety Smarak)

After two months of treatment, germination per cent, Seedling length and Seed vigour index of treated seeds were determined. Germination per cent varied from 52.33% in control (T₀) to 91.67% in T₁ where the seeds were treated with NSK powder. The highest being found in T₁ was 91.67% followed by 88.33% (T₄), 84.33% (T₃), 82.33% (T₅), 78.33% (T₆), 67.33% (T₇) and 59.67% (T₈) in neem leaf powder, karanj leaf powder, custard apple leaf powder, begunia leaf powder, curry leaf powder and turmeric powder treatment respectively. Seedling length varied from 7.51cm to 8.74cm in T₀ to T₁. There was no significant variation observed among treatments with respect to seedling dry weight and was varied from 0.023g to 0.034g. Highest seed vigour index-I (765.71) was obtained in NSK powder powder treatment (T₂) and lowest of 393.19 was found in control. In case of neem leaf powder (T₁) seed vigour index-I was found to be 728.06 followed by T₈ (714.55), T₅ (649.61), T₆ (649.61), T₁ (523.23), T₉ (496.09) and T₈ (455.83). The highest seed vigour index-II (3.15) was obtained from T₁ and the lowest (1.22) was recorded in control (Table 7). These findings support the observations taken by Kumar (2012) [⁹] who reported that rice moth infestation causes up to 94% seed damage was accompanied with rapid loss of germination per cent (2 to 54%) and vigour index of sesame seeds was 733.12 with least infestation and was 266.56 with high infestation of *Corcyra cephalonica*.

Effect of infestation of *Corcyra cephalonica* on seed quality parameters of sesame seeds (variety Amrit)

Parameters of sesamum seeds (variety Amrit) were determined, where it was found that infestation causes up to 94% seed damage was accompanied with rapid loss of germination per cent (2 to 54%) and vigour index of sesame seeds was 733.12 with least infestation and was 266.56 with high infestation of *Corcyra cephalonica*.

Table 7: Seed quality parameters of treated seeds of Smarak variety after two months of infestation

| Treatments | Germination (%) | Seedling length (cm) | Seedling dry weight (g) | Seed vigour index-I | Seed vigour index-II |
|------------|----------------|----------------------|------------------------|---------------------|---------------------|
| T₀         | 88.33 (70.04)  | 8.24                 | 0.034                  | 728.06              | 3.03                |
| T₁         | 91.67 (73.23) | 8.35                 | 0.034                  | 765.71*             | 3.15*               |
| T₂         | 67.33 (55.14) | 7.80                 | 0.025                  | 525.23               | 1.68                |
| T₃         | 82.33 (65.15) | 7.89                 | 0.029                  | 649.61               | 2.39                |
| T₄         | 63.33 (52.73) | 7.83                 | 0.025                  | 496.09               | 1.60                |
| T₅         | 59.67 (50.57) | 7.64                 | 0.023                  | 455.83               | 1.39                |
| T₆         | 78.33 (62.26) | 8.74                 | 0.028                  | 684.63               | 2.23                |
| T₇         | 84.33 (66.69) | 8.47                 | 0.032                  | 714.55               | 2.70                |
| T₈         | 52.33 (46.34) | 7.51                 | 0.023                  | 393.19               | 1.23                |
| S.E.m(±)   | 0.335          | 0.052                | 0.0004                 | 4.185                | 0.029               |
| C.D.(0.05) | 0.99           | 0.15                 | 0.001                  | 12.44                | 0.09                |

*Mean of 3 replications

Figures in parentheses are angular transformed values

Mean followed by similar letters in a column are not significantly different

Table 8: Seed quality parameters of treated seeds of Amrit variety after two months of infestation

| Treatments | Germination (%) | Seedling length(cm) | Seedling dry weight(g) | Seed vigour index-I | Seed vigour index-II |
|------------|----------------|---------------------|------------------------|---------------------|---------------------|
| T₀         | 89.00 (70.64)  | 8.47                | 0.038                  | 756.81              | 3.17                |
| T₁         | 92.00 (73.59)  | 8.23                | 0.039                  | 759.09              | 3.52                |
| T₂         | 70.33 (57.00)  | 7.63                | 0.031k                | 531.91              | 2.32                |
| T₃         | 84.33 (66.69)  | 8.64                | 0.034h                | 728.92              | 2.76                |
| T₄         | 64.33 (53.33)  | 7.19                | 0.029                  | 474.89              | 1.76                |
| T₅         | 59.33 (50.38)  | 7.42                | 0.028                  | 442.40              | 1.48                |
| T₆         | 79.00 (62.73)  | 8.18                | 0.035                  | 672.53              | 2.74                |
| T₇         | 83.67 (66.16)  | 8.21                | 0.034                  | 696.65              | 2.84                |
| T₈         | 54.00 (47.29)  | 6.99                | 0.029                  | 379.27              | 1.50                |
| S.E.m(±)   | 0.363          | 0.098               | 0.0014                 | 8.05                | 0.102               |
Mean followed by similar letters in a column are not significantly different

**Table 9:** Oil, protein and phenol content of healthy and infested seeds of sesame varieties

| Varieties | Oil content (%) | Protein content (%) | Phenol content (mg/g) |
|-----------|-----------------|---------------------|-----------------------|
| Uninfested seeds | | | |
| Smarak | 48.65 | 13.74 | 1.30 |
| Amrit | 42.05 | 15.18 | 2.02 |
| Prachi | 45.75 | 17.10 | 2.72 |
| Infested seeds | | | |
| Smarak | 42.60 | 17.44 | 1.87 |
| Amrit | 40.35 | 18.14 | 2.37 |
| Prachi | 43.10 | 19.26 | 2.80 |

**Conclusions**

Under Bhubaneswar agro-climatic conditions of Odisha the rice moth *Corcyra cephalonica* Staint. is a major pest of stored sesame. White seeded variety (Smarak) was found to be more vulnerable to rice moth infestation than the black seeded variety (Prachi). Sesamum cultivars having higher level of proteins and phenolic content proved more resistance to *Corcyra cephalonica* infestation. The relative efficacy of plant products revealed that NSK powder is most effective as it inhibits larval development as well as adult emergence. Viability of seeds is found to be least affected in case of NSK powder and neem leaf powder treatments.

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