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Economics of different diets used for comparative study of rice moth, *Corcyra cephalonica* (Stainton)

Kale AS, Neharkar PS, More PR and Harke GP

Abstract
Experiment was carried out to study the "Comparative performance of different diet ingredients on growth and development of rice moth, *Corcyra cephalonica* (Stainton) under laboratory condition" at Insect Parasitology laboratory, Department of Agricultural Entomology, College of Agriculture, VNMKV, Parbhani during 2020 – 2021. The study revealed that maximum cost for preparing each diet was recorded in T_5 i.e. Sorghum 2.5 kg + Groundnut 150 g with Rs. 71.75 and the minimum was recorded in T_2 i.e. Bajra 2.5 kg with Rs. 55.5. The highest egg production of *Corcyra cephalonica* was recorded 25.14 cc in Sorghum 2.5 kg + Groundnut 150 g (T_5) and the lowest 13.15 cc in Bajra 2.5 kg + Soybean 150 g (T_4). Total income of rice moth was maximum with Rs. 2514 obtained from Sorghum 2.5 kg + Groundnut 150 g (T_5) and the minimum income was recorded in Bajra 2.5 kg + Soybean 150 g (T_4) with Rs. 1315. The highest net profit was Rs. 2298.75 reported from Sorghum 2.5 kg + Groundnut 150 g (T_5) while the lowest was observed from Bajra 2.5 kg + Soybean 150 g (T_4) with Rs. 1132.75. Sorghum 2.5 kg + Groundnut 150 g given the highest egg production and net profit over all treatments but it required maximum cost for preparing diet.

Keywords: Economics, rice moth *Corcyra cephalonica*, different diets

Introduction
Our populous, fast-paced world demands quality food that is affordable and lots of it. When it comes to agriculture and need to meet our world's growing needs, pesticide use is often a topic of controversy. Pesticides often increase crop yields but an abundance of crop yields is an anachronistic when the cost is human life. Farmers has become increasingly concerned about the use of pesticides and the possible adverse effects on human health, wildlife and overall environmental quality. Among various methods of pest suppression biological pest suppression is painstaking to be the most environment friendly, economic and everlasting tool of IPM strategies forming a part of sustainable agriculture. The rearing host diet media of *Corcyra cephalonica* is potentially of status to the nutritious quality of host eggs released into the environment as biological control agents (Hunter, 2003). Rearing of *Corcyra cephalonica* on effectual food stuffs resulted in production of powerful eggs and moths.

Material and Methods
The present investigation was conducted to study the "Comparative performance of different diet ingredients on growth and development of rice moth, *Corcyra cephalonica* (Stainton) under laboratory condition" at the laboratory of Insect parasitology research scheme, Department of Entomology, College of Agriculture, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani during the academic year 2020-2021.
Price of grains, related other requirements and total egg production of *C. cephalonica* were recorded and then the net profit was calculated.

Results and Discussion
The present research analysis was carried out to study the economics of treatments i.e. total cost for preparing diet and net profit for rearing *Corcyra cephalonica* for mass production under laboratory conditions during 2020 – 2021. The data regarding total cost of diet was evaluated. Each box was filled with 2.5 kg of grains. Price required to prepare the diet along with grains and other requirements were recorded.

Table 1: Prevailing cost of grains used in the experiment

Name of grains	Price of Rs/Kg
Sorghum	22
Bajra	20
Groundnut	75
Soybean	35

Other requirements i.e. *Corcyra* diet fortified with baker's yeast @ 5 g and streptomycin sulphate @ 50 mg total cost Rs. 5.5 per container was common in all treatment.

The data according to total cost required for preparing diet to fill each box for rearing *Corcyra cephalonica* was varied from Rs. 55.5 to Rs. 71.75 with a mean of Rs. 64.19. In the present study, maximum cost for preparing a diet was recorded in Sorghum 2.5 kg + Groundnut 150 g (T_5) with Rs. 71.75 and the minimum cost for preparing the diet was recorded in Bajra 2.5 kg (T_2) with Rs. 55.5. Similarly total cost required for preparing whole diet for each of 3 replications was lowest of Rs. 166.5 for Bajra 2.5 kg and highest of Rs. 215.25 for Sorghum 2.5 kg + Groundnut 150g.

Egg production

The observations of the total egg production of rice moth, *Corcyra cephalonica* reared on different diets have the egg production ranged from 13.15 to 25.14 cc with an average of 19.74 cc. The maximum egg production of *Corcyra cephalonia* was recorded 25.14 cc in Sorghum 2.5 kg + groundnut 150 g (T_5). The next effective treatments for egg production was Bajra 2.5 kg + Groundnut 150 g (T_6) with 23.75 cc. The minimum egg production of *Corcyra cephalonica* was recorded in Bajra 2.5 kg + Soybean 150 g (T_4) with 13.15 cc. Treatment Sorghum 2.5 kg + Groundnut 150 g (T_5) was considered superior over all treatment as per research observations.

The observations made in the present study were in agreement with Kumar *et al.* (2018) [2] who worked out on diet T_6 (Sorghum 1000 g + groundnut 50 g) showed the best result and surpassed other diet formulations with excessive egg production i.e. 21.73 cc. During the current experiment Kumar *et al.* (2019) [3] recorded the total egg production upto 10.49 cc. Lavanya (2020) recorded the highest fecundity was assessed in diets T_6 i.e. bajra + sorghum + additives (0.038 cc).

Total income

The observations of total income obtained from egg production of rice moth reared on different diet varied from Rs.1315 to 2514 with an average of Rs.1974.25. The maximum income was Rs.2514 obtained from Sorghum 2.5 kg + Groundnut 150 g (T_5) and the minimum income was recorded in Bajra 2.5 kg + Soybean 150 g (T_4) with Rs. 1315.

The present findings are in agreement with Neharkar *et al.* (2019) [4] who reported that among nine treatments to find best rearing diet for Corcyra cephalonica under laboratory condition and concluded that shortest life cycle and maximum fecundity were found in diet sorghum 2500g + Groundnut 150g followed by Bajra 2500g + Groundnut 150g However the cheapest diet found was Bajra 2500g and most expensive was Soeghum 2500g.

Tirthkar (2006) [5] who worked on the rearing of *Corcyra cephalonica* on bajra based diet has given the maximum net profit of Rs. 771.75. Deulkar (2010) [1] analyzed the data on economics of diets and proven that Bajra based diets given maximum level of net profit i.e. Rs. 711.50.

Kumar *et al.* (2018) [2] worked out that among nine diet media used in experiment, diet i.e. Sorghum 1000 g + Groundnut 50 g showed net profit i.e. Rs. 283/-.

Net profit

The observations concluded that the net profit obtained from rearing *Corcyra cephalonica* on different diets varied from Rs. 1132.75 to 2298.75 with an average of Rs. 1776.7. The highest net profit was Rs. 2298.75 reported from T_5 i.e. Sorghum 2.5 kg + Groundnut 150 g. The lowest net profit was observed from Bajra 2.5 kg + Soybean 150 g (T_4) with Rs. 1132.75.

These values are in close agreement with Kumar *et al.* (2018) [2] worked out that among nine diet media used in experiment, diet Sorghum 1000 g + groundnut 50 g showed highest total income i.e. Rs. 426.

Table 2: Total cost for preparing diet and net profit from rearing of rice moth, *Corcyra cephalonica* (Stainton) on different diets

Tr. No.	Treatments	Total cost for preparing diet (In Rs.)	Total cost for 3 replications diet	Total egg production (In cc)	Total income (In Rs.)	Net profit (In Rs.)
T_1	Sorghum 2.5 kg	60.5	181.5	15.07	1507	1325.5
T_2	Bajra 2.5 kg	55.5	166.5	19.74	1974	1807.5
T_3	Sorghum 2.5 kg + Soybean 150 g	65.75	197.25	20.00	2000	1802.75
T_4	Bajra 2.5 kg + Soybean 150 g	60.75	182.25	13.15	1315	1132.75
T_5	Sorghum 2.5 kg + Groundnut 150 g	71.75	215.25	25.14	2514	2298.75
T_6	Bajra 2.5 kg + Groundnut 150 g	66.75	200.25	23.75	2375	2174.75
T_7	Sorghum 1.25 kg + Bajra 1.25 kg + Soybean 150g	63.25	189.75	18.64	1864	1674.25
T_8	Sorghum 1.25 kg + Bajra 1.25 kg + Groundnut 150g	69.25	207.75	22.05	2205	1997.25
	Range	55.5 – 71.75	166.5 – 215.25	13.15 – 25.14	1315 – 2514	1132.75 –2298.75
	Mean	64.19	192.56	19.74	1974.25	1776.7

Rice moth, *Corcyra cephalonica* (Stainton) eggs @ Rs. 100 per cc.

Conclusion

These research finding concluded that among all the eight treatment used for rearing *Corcyra cephalonica* T_5 i.e. sorghum + groundnut had given the highest total egg production, total income and net profit as compared to other diets.

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