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CASE REPORT

STUDY OF A CASE HISTORY OF THE VEGETABLE PEST *PIERIS BRASSICAE* LINNAEUS (LEPIDOPTERA, PIERIDAE) ON THE VEGETABLE PLANT *BRASSICAOLERACEA* VAR. BOTRYTIS, OF RAMGARH, (JHARKHAND, INDIA)

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ABSTRACT

The green vegetable *Brassica oleracea* var.Botrytis.is one of the most delicious food item for the common people. It is cosmopolitan in distribution and the farmers cultivate it as cash crop throughout the year. *Brassica oleracea var. Botrytis*. The cauliflower is commonly called as fulgobhi. *Brassica oleracea var. botrytis* is a delicious as well as nutritive vegetable .It is rich in potassium, sodium, calcium, vitamin B6, very low quantity of fat, and carbohydrate. Cholesterol is totally absent, very low calories recommends it as a healthy food for the people. The farmers of Ramgarh produces abundant quantity of cauliflower and supply it to the metro cities through road and rail .It is one of the main crop to get sound earning. The vegetable pest *Pieris brassicae* Linnaeus, is a serious pest damage the vegetables of cruciferous plant. The larvae of this pest damage the crop at every stages. The younger stage larva just scrapes the surface of the leaves and later they enter in the flower eaten voraciously and result the destruction of the host plant and the flower remain with full of excreta .The infestation is so serious that sometimes all the crop of the field destructed by the pest. The younger stage larvae eat the soft leaves and damage the foliage, later the larvae eat the flower, the complete flower was damage and the excreta of the larvae remain there. The larvae is the only destructive stage. The pest not damage the crop only but it decline the nutritive value, the taste, it also damage the marketing of the crop. The life cycle was studied during the year 2018 -2020 at Ramgarh. During the study It was found that the life-history of pest was very simple generally it completed 04 to 05overlapping generations between September to May of a year .The pest damage the cultivated vegetable plants and loss not only the quality, quantity, and taste of the vegetables but also the profit of the farmers. Ramgarh is a beautiful district town, the rural area is known for agriculture and gross vegetable production, the climatic condition is moderate and suitable for the cultivation of *Brassica oleracea var. botrytis* vegetable. The experimental pest destroy the cultivated plant. The farmers are advised to control the pest by chemical pesticide spraying carbary l 0.2%, malathion 0.05%., or diazinon 0.02%.

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INTRODUCTION

*Pieris brassicae Linnaeus.*is a serious pest of cruciferous vegetable plants. This butterfly is universally distributed in Myanmar, Sri Lanka and India. The life-history of this pestneeds moist and moderate cold climate. Ramgarh is a beautiful district town located at Lat.23.38^{o} N and Long.85.34 ^{o} E., situated very near to Ranchi, the capital of Jharkhand ,about 40 km. south-east .The temperature is moderate with more humidity. This climate is favorable for vegetable cultivation. Cabbage, Brinjal, Cauliflowers, Lady's fingers, cucurbitaceous vegetables etc. are the main vegetable crops of Ramgarh. Considerable works have been done by workers on the life history of *Pieris brassicae* Linnaeus, pest on different cabbage vegetable plants, but none of the scientist studied the life cycle of *Pieris brassicae Linnaeus.* On *Brassica oleracea var.botrytis*, plant in Ramgarh. The present author deals with the life cycle of *Pieris brassicae Linnaeus. on plant Brassica oleracea var. botrytis*, the cauliflower vegetable plant in Ramgarh. Cauliflower is a delicious as well as nutritive vegetable rich in potassium, sodium, calcium, vitamin B6 etc. absent of cholesterol and very low calories make it the recommended diet for the people. It is full of vitamins, minerals and fibers. The pest not only decline the quality, quantity and taste of the vegetable but also decline the financial condition of the farmers. The pest completed 04 to 05 overlapping generation during the month September to May of a year. On the favorable season come in the month of September the butterflies become active and after mating the females lay eggs on the leaves of the host plant and continue their lifecycle. After 03 to 20 days of incubation the eggs hatched in to small green caterpillars and they started to eat the fresh, soft leaves and the buds of the host plant .The larvae of different stages then infest the flower of the host plant .After attain full grown the larvae get pupation inside the flower. Prevention is very difficult of this pest, farmers are advised to spray the

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chemical Malathion 0.05 % or diazinon 0.02 % or carbaryl 0.2% or parathione 0.02%.

MATERIALS AND METHODS

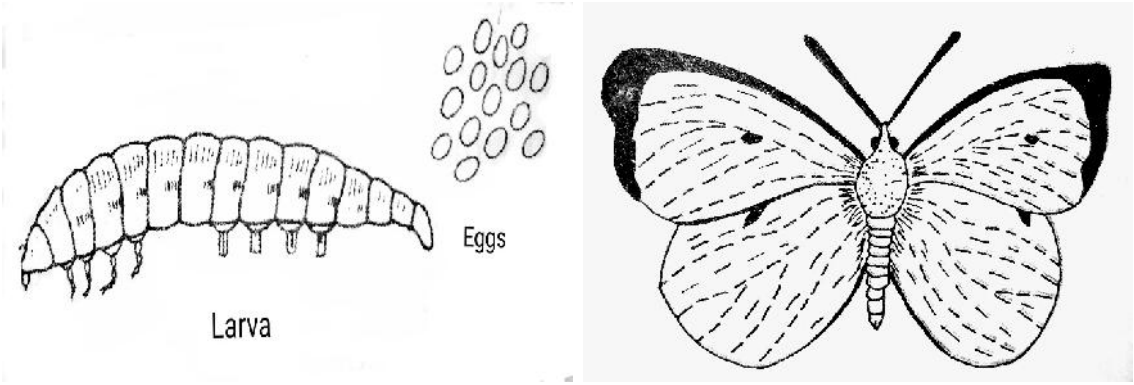
Standard methodology was applied for the study of life history of *Pieris brassicae Linnaeus*, on the vegetable *Brassica oleracea var. botrytis*. The life cycle and the nature of damage of the experimental pest were studied in the crop field as well as in the laboratory. The life history was studied during the year 2018—2020. Ten healthy selected plants of Brassica *oleracea var.botrytis*. (cauliflower) were completely and carefully covered by a small mesh mosquito net separately .One pair (one male and one female) of experimental pest were introduced on the plant covered by mosquito net and make observation daily. One pair (one male and one female) of the experimental pest were kept in the cage of 20 cm X 20 cm X 30 cm and provided them fresh leaves of host plant for egg laying and hatching, the observation were recorded for further study. Methods of prevention of crop and control of pests were applied and recorded. The records of the private agencies and the scientists of Birsa Agriculture University, Ranchi, was also keep in mind for accurate result.

caterpillar were greenish yellowin colour. The body were covered with short hairs, it was about 04 to 05 cm in length. Life cycle of pest: In the month of September the climate change, at the arrival of mild cold the butterfly took part in reproduction. After mating the female lays eggs in the cluster of 50 to 90 on the leaves of host plant .The eggs were yellowish in colors and conical in shape. The single female butterfly can lays 150 to 170 eggs. The female died after the egg laying. The caterpillar were hatched from eggs after the incubation in the month of September to October was of10 to12days, November to December was 15 to 18 days, January to February was 18 to 20 days, and March to May was07 to 03 days (table). The newly hatched caterpillar were small and green coloured. The tinny caterpillar eat voraciously the leaves of the host plants and sometimes the apical bud of the host plant, some of the caterpillar enter the flower of the crop, after passing 05 moulting the caterpillar become full grown larval stage, in the month of September to October it takes20 to 25 days in the month of November to December it was 25 to 30 days, in the month of January to February it was 30 to 40 days, in the month of March to May it was 20 to 12 days. The full grown larva was large it measure04 to 05cm in length. The full grown caterpillar was greenish yellow in color.

Table 1.

Sr. no.	Name of months	No. of eggs laid	Incubation period of eggs in days	No. of days of caterpillar mature	No. of days of pupation	No.of days as adults life span
1.	September-October	150—170	10 –12	20---25	15---20	05 -08
2	November-December	150—170	15-18	25---30	15---20	10 -12
3	January-February	150—170	18-20	30 --40	20---25	10 -12
4.	March-May	150 -170	07 - 03	20—12	10-05	03--02

Tabular representation of lifecycle of pest Pierisbrassicae Linnaeus., on host plant Brassica oleraceavar. botrytis.



Life cycle of *Pierisbrassicae* Linnaeus. on the host plant *Brassica oleracea* var. botrytis

Observation

Moderate temperature and moist weather is suitable for the vegetable cultivation. *Pieris brassicae* Linnaeus.is one of the serious cruciferous pest, now the present author deals the life history of *Pieris brassicae Linnaeus*. On vegetable *Brassica oleracea var. botrytis. The cauliflower*. It is a common vegetable of Ramgarh (Jharkhand), cultivated throughout the year. Morphology of the pest: The experimental adult butterfly is large in size it is about 06.5 cm across the spread wings .The body was pale white in color the dorsal surface of the body was provided with smoky shade. The female butterfly was little larger in size having two black dots on the dorsal side of each fore wing ,whereas the male butterfly was smaller in size and provided two black spots on the underside of each wing. Morphology of caterpillar: The newly hatched caterpillar were small, green in color. The full grown

The full grown caterpillar undergoes pupation either on the leaf or inside the flower or any suitable place near the host plant. The butterfly emerges out from pupa in the month of September to October 15 to20 days, in the month of November to December 15 to 20 days, in the month of January to February 20 to 25 days, and in the month of March to May it was 10 to 05 days. The life span of adult butterfly varies from 02 to12 days, it was in the month of September to October 05 to 08 days, in the month of November to December it was 10 to12 days, in the month of January to February it was 10 to12 days and in the month of March to May it was 03 to 02 days. The only destructive stage was the caterpillar. The 1st instar larvae just scrapes the surface of the leaves but later instars enters the flowers and eaten voraciously result was completely destruction of the host plant.

Suggestion for Pest Control: Farmers are advised to spraying chemical pesticides as diazinon(0.2%)Parathion (0.02%) or Malathion (0.05 %) can be minimized the pest population on host plant.

- If the infestation occur during later stage, carbaryl 0.2% can also be spray

DISCUSSION

The cruciferous vegetable *Brassica oleracea var. botrytis* is a delicious vegetable and is one of the main dietary component of the common people. It is also the main vegetable item of the restaurant also. It is the main component of a variety of food items. The production of cauliflower is so abundant in Ramgarh that it control the vegetable market in price hike. The main crop of farmers of Ramgarh are chiefly vegetable cultivation and the vegetable yielding is abundant. Ramgarh is situated on the 4 lane N.H.33 and good connectivity of railway makes it very convenient to transport make the Ramgarh good and prime market for vegetable sale (Upadhyay 2017, Upadhyay & Bakshi 2020, and Upadhyay 2020). The vegetable *Brassica oleracea*var. botrytus is full of vitamins, fibres and minerals. Its ingredients help to strengthen the bones, boost the cardiovascular systems. It is one of the best recommended healthy food for the people. The experimental pest *Pieris brassicae* Linnaeus. is a serious pest of cruciferous plant. The present paper deals the life cycle of the pest on *Brassica oleracea var. botrytus*, it is a common yielding vegetable crop of Ramgarh its production is abundent throughout the year. The farmers cultivated this vegetable commercially as well as for their own family consumption (Upadhyay et. al. 2012, Upadhyay & Bakshi2019, 2020). The life history 0f the pest *Pieris brassicae* Linnaeus is very short and simple, it was 03 weeks in summer and 11 weeks in winter. In March to May the life *cycle* completed in 03 weeks, in the month of September to October the life cycle completed in 07weeks but when the temperature fall the life cycle delayed in the month of November to December the life cycle completed in 08 weeks and in the month of January to February the life cycle completed in 11 weeks. The life cycle was directly influenced by the temperature. All the metabolic activities directly affected by the temperature, humidity, pH etc. (Upadhyay & Verma 2004, 2005, Upadhyay 2009 and Upadhyay 2020). Prevention and control of the pest is a very difficult phenomena.

The spray of carbaryl 0.2%, diazinon 0.2% or, malathion 0.05% or parathion 0.02%,endrin 0.04% kill the eggs, larvae and adults on the surface (Kumar & Tiwari 2009, Prabhakar & Roy 2009). Destroy the infected parts of plants.

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