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## RESEARCH ARTICLE

# STUDIES OF VEGETABLE PESTS OF RAMGARH (JHARKHAND, INDIA): A CASE STUDY OF CABBAGE PESTS

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**ABSTRACT**

Ramgarh is a beautiful district town of Jharkhand state, about 40 km from Ranchi, situated at N.H.31. Forest, hills and rivers give it an attractive looks .The local population is totally depends on agriculture especially the production of vegetables villege,Chhattarmandu, Gosa, Jara, Kankebar, Koiritola, Murrambari, Murramkala etc. are the main vegetable producing villages. Potato, Brinjal, Tomato,cabbage, cauliflower, Radish, and all types of vegetables of cucurbitacea family are the main crops.The cabbage is one of the important vegetable produced in huge amount in Ramgarh .The nutritional value and liking of taste makes it the most popular vegetable, producing throughout the year as availability of irrigation. The vegetables are get damaged by the vegetable pests*,"Crocidolomia binotalis" (Zell) and "Peiris brassicae",* Linn, *are the main pests* of cabbage . *The loss by p*est are not merely in terms of quantity but also in quality of vegetables and change the various essential chemical constituents regards the nutritive and lime carbaryl (0.1%), femitrothin (0.05 %) etc, application of pesticide minimize the pest population .



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## INTRODUCTION

Vegetables are the main source of starch and carbohydrate to produce energy for the vital activity of organism .It is also the main dietary component of human being .It is the cheap source of mainly nutrients and minerals. Ramgarh is one of the main mandi of vegetables. It supplies 50 to 70 tons. In which 50 % is the cabbage per day in the season mainly to Ranchi, Kolkata some of the vegetables are also supplied to the Delhi market. The climatic condition and poor facilities of irrigation promotes the cultivation of vegetables at Ramgarh This situation promotes the population growth of pests. Different types of pest damage different types of vegetables they do not reduce only the quality but also the quantity and nutritional value and result low marketing price. Pest control is one of the important phenomenon in the vegetable production. Author suggests the application of different types of pesticides as well as the biological control methods of pest control.

## MATERIALS AND METHODS

The life cycle of pest and the nature of damage of vegetables were studied.

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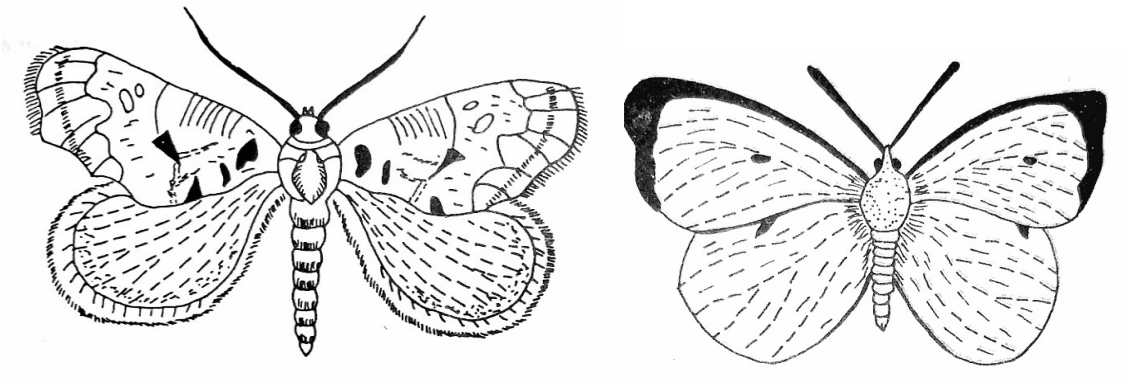
It was studied in the crop field and in the laboratory. There were seven villages, selected for the observation Those were 1) Chhatar Mandu 2) Gosa 3) Jara 4) Kankebar 5) Koiritola 6) Murrambari and 7) Murram kala . A small plant were totally covered by a small mesh mosquito net .Two pairs of pest (male and female ) were introduced on the healthy plant and take observation daily. In other hand two pairs of pests (male and female ) were kept for egg laying in a cage of size 20 cm X 20 cm X 30 cm, and provided them fresh leaves of the prepare the table. The eggs were kept for hatching at room temperature. After hatching the larvae were reared on the fresh leaves of the host plant. Fresh leaves of the host plant provided to the larvae daily, the observation were recorded. Methods of prevention and control of pests were recorded by the help of records of private agencies, the records of Birsa agriculture university, Ranchi, and the records prepared by the experimental laboratories.

### Observation

Different types of vegetables are infested by different types of pests which causes considerable damage Two most harmful pest of cabbage were selected for study:-

***Crocidolomia binotalis,* zell.** –The adult bears pale yellow coloured wing with iron rust coloured marking and tuft hairs .Larvae are green with median and lateral white lining.



**Crocidolomiabinotalis.** ***Peirisbrassicar***

**Table 1. Showing the life cycle of Cabbage pests**

| S. N | Name of the pest | No. of eggs laid | Hatching days | Larval days | Pupation days | Total life cycle in a year |
|---|---|---|---|---|---|---|
| *1* | *CrocidomiabinotalisZell..* | 40 –100. | 5 days in summer 15 days in winter. | 24—27 days in summer 50 days in winter. | 14 days in summer 40 days in winter. | 4 generations |
| *2* | *Peirisbrassicae , Linn.* | 150—170 | 3—4 days in summer 15—18 days in winter. | 15—16 days in summer 40—41 days in winter. | 5—6 days in summer 30 days in winter. | 4 generations. |

After copulation the female lays in masses of 40 to 100, larvae hatches out in 5 days in summer and up to 15 days in winter. Larvae feeds fresh leaves of host plant. Larval period is 24 to 27 days in summer and up to 50 days in winter. The larvae developed into cocoon inside the soil, sometimes cocoon developed within the webbed up of leaves of the host plant .Pupation period lasts for 14 to 40 days ( table ). It is one of the most serious pest of cabbage, it also infest radish, turnip and other crucifers.

***Pieris brassicae,* Linn:** The adult male and female butter flies are snow white. Males are smaller than females. The apical edge of fore wings of female has black patch whereas the fore wings of male has black spots present beneath the fore wings. After copulation the female lays eggs in the batches of 50 to 70 under surface of the leaves of host plant .The total number of eggs were 150 to170.

After laying eggs the adult female dies. The total life of an adult was 3 to 15 days. The incubation period depends on temperature of atmosphere. It may be 3 to 4 days in summer and up to 15 to 18 days in winter. The larvae were small in size and green in colour. They voraciously feeds up on the leaves of the host plant .After five moulting it attains its full grown size. The mature larvae undergoes pupation .Pupation occurs on the stem of near by tree or in any shelter place ;not on host plant. After 5 to 30 days pupa hatch into adult. Generally 4 generations are completed in a year.

**CONRTOL:**

- The adult moths and butter flies can be killed through light trap method.
- Dust DDT (10 %) or Carbaryl (10 %) is quite effective.
- Spray with malathion (0.05% ) or Diazinon (0.02 %) is more effective to applied 3 times in life cycle .
- Formers are advised to apply biological control for pests, it may be introduced 1.*Apanteles glomeratus, 2 Diplazonorientalis.* The larva of pests were parasitized by these agents.

## DISCUSSION

Cabbage is the important crop of Ramgarh. The farmers cultivated the it throughout the year as the availability of irrigation. The cabbage pests *Crocidolomia binotalis,* Zell. and *Pieris brassicae,* Linn are the most serious pests of cabbage. They not only destroy the quality and quantity of the cabbage but change the various essential components regards the nutritive value and taste of the vegetables. Considerable works has been by various workers but this area is neglected by the scientists. The present study is an attempt to highlight the various issue and visualise the importance of the vegetable production and pest control by the help of pesticides and biological control. The climatic condition of Ramgarh is quite moderate. During the normal temperature population of pests remain very high. The variation in temperature have a great affect up on its productivity. All the metabolic, physiological and life processes influenced (Upadhyayand Verma 2004, Upadhyay et.al. 2010). Climatic condition of Ramgarh is so favourable that along with pest other animals also damage the crops (Upadhyay 2017). The pest can be control after the destruction of eggs, larva, pupa and adults (Kumar & Tiwari 2009; Prabhakar & Roy 2009). The pest control can be done by biological control method, if the attack is serious than the application of pesticide is also practicable.

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