

## Short Communication

# Insect-pests complex of cabbage in eastern Uttar Pradesh

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India is the second largest producer of vegetable in world (after China) contributing is 11.4% of world's production. India is the world's second largest cabbage grower (after China). The one and a half million cabbage and cauliflower fields occupy 440,000 hectares in India with a production of 6.4 million tonnes annually (Mohan and Gujar, 2003). Cabbage, *Brassica oleracea* var. *capitata* is important in the diets in the country where vegetarianism is widespread. In its raw state, cabbage contains iron, calcium, and potassium. Its also contains vitamin C, vitamins B<sub>1</sub>, B<sub>2</sub>, and B<sub>3</sub> in a considerable amount (Meyling *et al.*, 2010). There is not a single but several insect-pests attack on cabbage. Bhatia and Verma (1993) reported 27 insect-pests attacking on cabbage in Himanchal-Pradesh. Cabbage is a major vegetable of Varanasi and much losses loss occurs due to insect-pests is here therefore, present investigation was made in Varanasi.

The present investigation was made on Vegetable Research Farm, Banaras Hindu University, Varanasi and different farmer fields in Ramna and Tikri, Varanasi during rabi 2007 and rabi 2008, the data were recorded for insect-pests complex of cabbage, *Brassica oleracea* var. *capitata*. The crop was transplanted in the mid August in 2007 and late August in 2008 at a spacing of 60 cm x 45 cm with row to row and plant to plant, respectively at Vegetable Research Farm, Banaras Hindu University, Varanasi and approximately same spacing at different farmer fields also. The observations of insect-pests were made at ten days interval on ten randomly selected plants with five spots. Thus, the fifty plants were visited right from transplanting to harvesting of crop. The pest species were collected, pinned, stretched, dried up and stored in the laboratory of the Network Project on Insect Biosystematics, department of Entomology and Agricultural Zoology, Institute of Agricultural Sciences, B.H.U. Varanasi-221 005, India

The distributions of different insect-pests were made during rabi 2007 and rabi 2008 in Varanasi U.P. and 23 insect-pests were recorded which are providing losses and beneficial effect on cabbage are presented in Table 1. Out of which some was found in considerable number and some in very low, classified as major and minor pests, respectively. Some one was medium in population also. The insect-pests were recorded belonged to 7 orders i.e., Orthoptera, Coleoptera, Diptera, Lepidoptera, Isoptera, Hemiptera and Hymenoptera (Table. 1). Out of these orders maximum numbers of insects i.e. 31% in order Lepidoptera where as minimum number of insect-pests 5% in order Diptera and Isoptera were recorded. The 22%, 14%, 14%, and 9% insect-pests were recorded from order Coleoptera, Orthoptera, Hemiptera and Hymenoptera, respectively (Fig.1). According to Table 2 at the time of transplanting surface grasshopper, *Chrotogonus trichypterus* (Blanch) was found. During vegetative stage, the crops were infested by short horned grasshopper, *Oxya nitidula* Walker, *Acrida* sp., leaf beetle, *Altica* sp., diamond back moth, *Plutella xylostella* (L.), semilooper, *Plusia* sp., tobacco caterpillar, *Spodoptera litura* (F.), white fly, *Bemisia tabaci* Genn., saw fly and *Athalia proxima* (Klung). Some were recorded at vegetative to heading stage are leaf webber, *Crocidolomia pavonana* (F.), diamond back moth, *Plutella xylostella* (L.), semilooper, *Plusia* sp., tobacco caterpillar, *Spodoptera litura* (F.), white fly, *Bemisia tabaci* Genn. and sulfur butterfly, *Pieris brassicae* (L.) and at heading stage were cabbage head borer, *Hellula undalis* Fab., gram pod borer, diamond back moth, *Plutella xylostella* (L.), *Helicoverpa armigera* Hubner and mustard aphid, *Lipaphis Erysimi* Kalt where as at right from vegetative to harvesting stage hadda beetle, *Epilachna vigintioctopunctata* Fab red pumpkin beetle, *Aulocophora foveicallis* (Lucas), black pumpkin beetle, *Aulocophora* sp, rove beetle, *Paederus* sp., coccinellids, *Coccinella septumpunctata* L., syrphid fly, *Ischiodon scutellaris*, termites, *Odontotermes obesus* (Rambur), painted bug, *Bagarada cruciferarum* Krik

Table 1: Insect pests complex of cabbage, *Brassica oleracea* var. *capitata* in Varanasi, U.P.

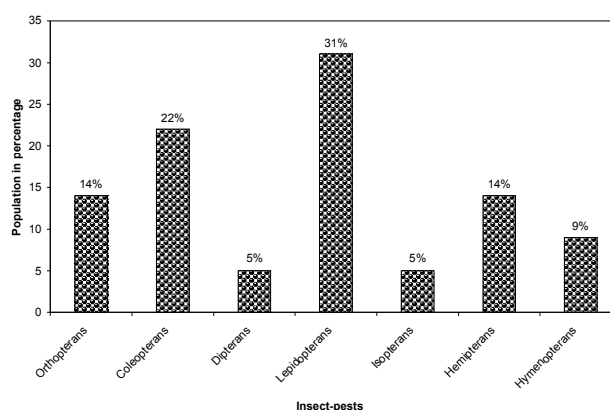
S. No	Common name	Zoological name	family
<b>1</b>	<b>Orthoptera</b>		
A	Rice short horned grasshopper	<i>Oxya nitidula</i> Walker	Acrididae
B	Short horned grasshopper	<i>Acrida</i> sp.	Acrididae
C	Surface grasshopper	<i>Chrotogonus trachypterus</i> (Blanchard)	Acrididae
<b>2</b>	<b>Coleoptera</b>		
A	Blue beetle/Leaf beetle	<i>Altica</i> sp.	Chrysomelidae
B	Hadda beetle	<i>Epilachna vigintioctopunctata</i> Fab.	Coccinellidae
C	Pumpkin beetle	<i>Aulocophora foveicallis</i> (Lucas)	Chrysomelidae
D	Rove beetle	<i>Aulocophora</i> sp	Chrysomelidae
E	Lady bird beetle	<i>Paederus</i> sp.	Staphylinidae
		<i>Coccinella septempunctata</i> L.	Coccinellidae
<b>3</b>	<b>Diptera</b>		
A	Syrphid fly	<i>Ischiodon scutellaris</i>	Syrphidae
<b>4</b>	<b>Lepidoptera</b>		
A	DBM	<i>Plutella xylostella</i> (L.)	Plutellidae
B	Cabbage borer	<i>Hellula undalis</i> Fab.	Pyralidae
C	Leaf webber	<i>Crociodolomia pavonana</i> (F.)	Pyralidae
D	Gram pod borer	<i>Helicoverpa armigera</i> Hubner	Noctuidae
E	Semilooper	<i>Plusia</i> sp.	Noctuidae.
F	Tobacco caterpillar	<i>Spodoptera litura</i> (F.)	Noctuidae
G	Cabbage butterfly	<i>Pieris brassicae</i> (L.)	Pieridae
<b>5</b>	<b>Isoptera</b>		
A	Termite	<i>Odontotermes obesus</i> (Rambur)	Termitidae
<b>6</b>	<b>Hemiptera</b>		
A	Mustard aphid	<i>Lipaphis Erysimi</i> Kalt	Aphidae
B	Painted bug	<i>Bagarada cruciferarum</i> Krik	Penttomidae
C	White fly	<i>Bemisia tabaci</i>	Aleyrodidae
<b>7</b>	<b>Hymenoptera</b>		
A	Mustard sawfly	<i>Athalia proxima</i> (Klung)	Tenthredinidae
B	Hymenopteran	<i>Diaeretiella rapae</i>	Braconidae

and a parasitoids, *Diaeretiella rapae*. In other hand rice short horned grasshopper, *Oxya nitidula* Walker, *Atractomorpha* sp., surface grasshopper, *Chrotogonus trachypterus* (Blanch), leaf beetle, *Altica* sp., hadda beetle, *Epilachna vigintioctopunctata* Fab. red pumpkin beetle, *Aulocophora foveicallis*(Lucas), black pumpkin beetle, *Aulocophora* sp., rove beetle, *Paederus* sp., syrphid fly, *Ischiodon scutellaris*, termites, *Odontotermes obesus* (Rambur), sulfur butterfly, *Pieris brassicae* (L.), gram pod borer, *Helicoverpa armigera* Hubner, mustard aphid, *Lipaphis Erysimi* Kalt painted bug, *Bagarada cruciferarum*, white fly, *Bemisia tabaci* Genn., saw fly and *Athalia proxima* (Klung), tobacco caterpillar, *Spodoptera litura* (F.), and a parasitoids, *Diaeretiella rapae* were collected through mummified aphid and *Cotesia plutellae* (L.) through parasitoid larvae, found

Table 2: Status and time of occurrence of surveyed insect pests on cabbage, *Brassica oleracea* var. *capitata* in Varanasi, U.P.

S. No.	Zoological name	Status	Time of occurrence
1	<i>Oxya nitidula</i> walker	*	Vegetative stage
2	<i>Acrida</i> sp.	*	Vegetative stage
3	<i>Chrotogonus trachypterus</i> (Blanchard)	*	Transplanting stage
4	<i>Altica</i> sp.	*	Vegetative stage
5	<i>Aulocophora foveicallis</i> (Lucas)	*	Vegetative – harvesting
6	<i>Aulocophora</i> sp	*	Vegetative – harvesting
7	<i>Epilachna vigintioctopunctata</i> Fab.	*	Vegetative – harvesting
8	<i>Paederus</i> sp.	*	Vegetative – harvesting
9	<i>Coccinella septempunctata</i> L.	**	Vegetative – harvesting
10	<i>Ischiodon scutellaris</i>	*	Vegetative – harvesting
11	<i>Plutella xylostella</i> (L.)	***	Vegetative-harvesting
12	<i>Hellula undalis</i> Fab.	***	Vegetative-harvesting
13	<i>Crociodolomia pavonana</i> (F.)	***	Vegetative – heading
14	<i>Helicoverpa armigera</i> Hubner	*	Heading stage
15	<i>Plusia</i> sp.	**	Vegetative – heading
16	<i>Spodoptera litura</i> (F.)	*	Vegetative – heading
17	<i>Pieris brassicae</i> (L.)	*	Vegetative – heading
18	<i>Odontotermes obesus</i> (Rambur)	*	Vegetative – harvesting
19	<i>Lipaphis Erysimi</i> Kalt	*	Heading stage
20	<i>Bagarada cruciferarum</i> Krik	*	Vegetative – harvesting
21	<i>Bemisia tabaci</i> Genn.	*	Vegetative – harvesting
22	<i>Athalia proxima</i> (Klung)	*	Vegetative stage
23	<i>Diaeretiella rapae</i>	*	Late Heading

Note: \*\*\* = High, \*\* = Medium and \* = low

Fig.1: Populations of of surveyed insect-pests on cabbage, *Brassica oleracea* var. *capitata* in Varanasi, U.P.

in low population and coccinellids, *Coccinella septempunctata* L. and semilooper, *Plusia* sp. were medium in population where as diamond back moth, *Plutella xylostella* (L.) and cabbage head borer, *Hellula undalis* Fab. were high in population and were major pest while rest of the minor pest.

The present results are in the support with the finding of Rao and Lal (2004) who have recorded 19 insect pest and 4 natural enemies, during rabi season out of which two major mustard aphid, *Lipaphis erysimi* Kalt and DBM, *Plutella xylostella* (L.) Similar results found in different crops and location such as Thakur *et al.* (2008), Olfert *et al.* (2005), Balevski *et al.* (2007) and Meyling *et al.* (2010).

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- Thakur A, Singh NK, Singh J (2008) Biodiversity of lepidoptrous insects in the field crops under Varanasi climatic conditions. *Journal of Applied Zoological Researches* 19: 127-131. Table 1: Insect pests complex of cabbage, *Brassica oleracea* var. *capitata* in Varanasi, U.P.