

A survey of agricultural pests and predators on cole crops in Kanpur region, Uttar Pradesh, India

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ABSTRACT :

The study was conducted from October to December 2015 in Kanpur region, U.P. to survey on agricultural pests and predators on cole crops (cabbage and cauliflower). Cole crops are a large and increasingly important crop groups. A number of insects feed exclusively on cole crops and affect all of the crops. A survey was conducted at four sites (COD, Katri, Pukhrayan and Ghatampur) in Kanpur region and inspected in two types of field *i.e.* insecticides sprayed field and organic field (unsprayed). The present study resulted that a small number of predators and some pests were found in pesticides sprayed field of cole crops due to chemical pesticides and in organic field large quantity of predators but few pests were recorded in cole crops. These crops were the focus of the study because they are locally important to organic growers.

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INTRODUCTION

Indian agriculture is predominantly characterised by the cultivation of a wide variety of food and non-food crops. The food crops refer to cereals, pulses, oilseeds, vegetables, fruits and others (Singh and Sandhu, 1986 and Rangarajan *et al.*, 2000). The protection of agricultural crops from various kinds of pests is a chronic problem. Several insect orders cause the damage of agricultural crops by defoliating, leaf mining, sucking the cell sap, boring various parts, forming galls etc. During last 50 years, the use of chemical insecticides has been increased enormously resulting many serious problems like air, water pollution, health hazards, killing of beneficial

organisms destruction of natural balance and ecological cycle, pest resistance, pest resurgence and secondary pest out-break, etc. Among them, synthetic insecticides have long been used which have serious drawbacks (Sharaby, 1988) and affect non- target organisms and environment (Islam *et al.*, 2003). This clearly indicates that there is an urgent need of alternative for chemical insecticides. Biological pest control is living weapon over chemical control (Weeden *et al.*, 2007). Enhancing efforts have been directed towards biological pest control since it is very effective alternative for chemical control. Cole crops (cruciferous vegetables) are a large and increasingly important crop group (Vegetable

programme, 2013) A number of insects feed exclusively on cole crops and affect all of the crops (Mustard, turnip, radish, cabbage, cauliflower, Broccoli etc.) Predation has been found effective against many pests (Huffaker and Gutierrez, 1991).

An understanding of farmers' indigenous knowledge and the strategies they adopt in solving problems helps in conducting research which involves farmers participation and that will lead to adoptable and effective pest control option which meet farmers need (Nyeko *et al.*, 2002). In Africa, the majority of farmers still depend on indigenous pest management approaches to manage pest problem (Abate and Van Huis, 2000).

MATERIAL AND METHODS

The study area :

Insect pests and their natural enemies occurring on cole crops were observed in four field sites (COD, Katri, Pukhrayan and Ghatampur) in Kanpur region during the period from October to December 2015. Survey conducted on treated and untreated cole crops.

The study concentrated on pests and their predators on cole crops (radish, cabbage and cauliflower). The

insects and predators were survey and collected from October to December 2015. For the survey, four field sites (COD, Katri, Pukhrayan and Ghatampur) were surveyed. Sweep net was used for pests collection .The pests and predators collected by the above method were transferred to killing bottles, killed and preserved. Caterpillars, pre-pupae and pupae were collected from each field. Insects were sorted out and taken help from Department of entomology, Chandra Shekhar Azad University of Agriculture and Technology, Kanpur, U.P. for identification and for confirmation.

RESULTS AND DISCUSSION

The information recorded with respect to incidence of different insect pests on different crops during survey. Most fields surveyed were managed as commercial processing vegetables and treated with conventional two were managed organically. The present study showed (Table 1) that 2 species of pests (*Lipaphis erysimi*, and *Pieris brassicae*) and 3 species of predators (*Coccinella septumpunctata*, *Chrysoperla carnea* and fire ant) belonging to four orders were observed in unsprayed cabbage, cauliflower (cole crops) in four different

Table 1: Pest and their predators recorded in four different locations of Kanpur region on cabbage, cauliflower (Cole crops) in untreated condition

Sr. No.	Field sites	Pests			Predators			
		Common name	Scientific name	Order	Family	Scientific name	Order	Family
1.	COD	Mustard aphid	<i>Lipaphis erysimi</i> Kalt.	Hemiptera	Aphididae	<i>Coccinella septumpunctata</i>	Coleoptera	Coccinellidae
2.	Katri	Cabbage butterfly	<i>Pieris brassicae</i> Linn.	Lepidoptera	Pierriidae	<i>Coccinella septumpunctata</i>	Coleoptera	Coccinellidae
3.	Pukhrayan	Nil	-	-	-	<i>Coccinella septumpunctata</i>	Coleoptera	Coccinellidae
						<i>Chrysoperla carnea</i>	Neuroptera	Chrysopidae
4.	Ghatampur	Nil	-	-	-	<i>Coccinella septumpunctata</i>	Coleoptera	Coccinellidae

Table 2: Pest and their predators recorded in four different locations of Kanpur region on cabbage, cauliflower (Cole crops) in treated conditions

Sr. No.	Field sites	Pests			Predators				
		Common name	Scientific name	Order	Family	Common name	Scientific name	Order	Family
1.	COD	Diamond back moth	<i>Plutella xylostella</i> Linn.	Lepidoptera	Plutellidae	Nil	-	-	-
2.	Katri	Nil	-	-	-	Nil	-	-	-
3.	Pukhrayan	Mustard aphid	<i>Lipaphis erysimi</i> Kalt	Hemiptera	Aphididae	Lady bird beetle	<i>Coccinella septumpunctata</i>	Coleoptera	Coccinellidae
4.	Ghatampur	Diamond back moth	<i>Plutella xylostella</i> Linn.	Lepidoptera	Plutellidae	Nil	-	-	-

locations of Kanpur region. All these pests were recorded in low to medium numbers causing moderate damage. Predation have been found many pests (Mathur *et al.*, 2001 and Tripathi *et al.*, 1988).

The increased use of insecticides enhances the resistance of insect pests (*Plutella xylostella* and *Lipaphis erysimi*) and only one species of predator (*Coccinella septempunctata*) as recorded in the month of October, November, December 2015 as presented in Table 2 on sprayed conditions of cabbage and cauliflower crops in four various region of Kanpur. The dominant species of *Plutella xylostella* exhibited the tendency to be the most serious key pest of cole crops in Kanpur region, U.P. Comparing the pests and predator of four sites, the unsprayed plot seemed to have more diverse habitat. In the present study were observed the different insect species communities could be useful for a better understanding of insect biodiversity interaction and for enhancing pest management strategies in cole crops growing areas. The indiscriminate use of chemical pesticides to achieve higher vegetable yields could lead to disruption of natural control systems; increase the risk of contamination of the farm environment, pesticide residues in fresh produce and health risk to consumers. This highlights the importance of identifying and promoting safer and low alternatives to the synthetic products. Despite the high level of pest awareness, some farmers did not report any specific control measure used. It is specifically noted that none of farmers had an awareness of host plant resistance and biological control. Besides strict implementation of the policies related to the use of pesticides, there is a great need of creating awareness among the farmers, and other stakeholders by both governments and non-government organizations (Dwivedi and Sheth, 2008). Most of the pesticides applied are potent toxins and their intensive use poses potential hazards to humans, livestock and the environment (Chamber *et al.*, 2001 and Ngowi *et al.*, 2007) A search through the pages of literature reveals that no doubt, considerable work has so far been done on survey of predators and pest of cole crops in Kanpur region.

In India, there is need to have a detailed survey of predator. There is endless scope to do research on the different aspects of pests and predators in India.

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