

Natural Parasitisation of *Pieris brassicae* (Lepidoptera: Pieridae) by Tachinid flies (Diptera) on some vegetable crops in Kashmir

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ABSTRACT

The cabbage large white butter fly, *Pieris brassicae* L. (Lepidoptera: Pieridae) is one the major insect pests of cruciferous vegetable crops in Kashmir causing considerable damage to the host crops. A field survey was carried out from 2006-2007 in different areas of Kashmir to explore tachinid fly parasitoids of this pest in the *Brassica* agro-ecosystem. The field and laboratory investigation revealed that the larvae of *P. brassicae* were found to be parasitized by 2 tachinid flies, viz., *Exorista larvarum* L. and *Compsilura cocinnata* Meign (Diptera: Tachinidae). The parasitism was observed on various crops such as *Brassica oleracea* var. *campestris*, *B. o.* var. *gongylodes*, *B. o.* var. *capitata* and *B. o.* var. *acephala* and *Raphanus sativus*. However, the overall percentages of the parasitism was recorded to be quite low in the range of 0-1.9% in 2006 and 0-1.4% in 2007 in case of *E. larvarum* and 0-2.7% in 2006 and 0-2.1% in 2007 in case of *C. cocinnata* respectively. These parasitoids are being reported for the first time on *P. brassicae* from Kashmir region.

Key words: Tachinidae, parasitoid, *Pieris brassicae*, *Exorista*, *Brassica*, Kashmir.

The cabbage large white butter fly, *Pieris brassicae* L. (Lepidoptera: Pieridae) is a cosmopolitan insect, and is found wherever cruciferous plants are grown⁷. Some-times massive outbreaks of this pest may occur and injury on cabbage cultures may be severe⁶. *P. brassicae* is one the major insect pests of cruciferous vegetable crops such as cabbage,

cauliflower, knol-khol, turnip, kale, mustard, radish *etc.* in Kashmir also³. There have been many successful cases of insect parasitoids being used to control harmful native arthropods^{4,5,9}. The role of beneficial organisms (such as parasitoids) as natural enemies of insect pests on cabbage is of great consequence¹. Parasitoids play an important role in reducing the population density of *P. brassicae*. Many natural enemies (parasitoids and predators) of *P. brassicae* are known to occur across the world, like wise, some natural enemies of *P. brassicae* have also been reported from the Kashmir region by Bhat *et al*², however no published record of parasitisation of *P. brassicae* by tachinid flies has been found in Kashmir. So there was a need to conduct investigations and gather information on the tachinid fly parasitoids of *P. brassicae* and to assess their parasitism rate in this unexplored region.

The field surveys were conducted during the years 2006-2007 in various cruciferous crop growing areas in 7 districts of Kashmir, *viz.*, Anantnag, Baramulla, Badgam, Bandipora, Pulwama, Ganderbal and Srinagar. Samples were collected randomly on weekly basis from the selected sites in the said districts. Although the investigation was primarily undertaken to explore hymenopterous parasitoids of *P. brassicae*, however, along side this, observations were also recorded on the tachinid parasitoids of this pest. All the life-history stages of this pest were collected from the fields and reared under laboratory conditions. The rearing was done at room temperature in cylindrical glass containers (15 cm dia. 20 cm height), covered with fine muslin cloth. Larvae were fed on

foliage of host plants. Emerged parasitoids were identified by experts and the percentage of parasitism by each parasitoid was estimated.

The rearing of *P. brassicae* in the laboratory revealed the occurrence of few tachinid fly parasitoids of which 2 were identified as *Exorista larvarum* Lin. and *Compsilura cocinnata* Meign (Diptera: Tachinidae). The parasitoids were recovered from the host pest samples of *P. brassicae* collected from several crops like *Brassica oleracea* var. *campestris*, *B. o.* var. *gongyloides*, *B. o.* var. *capitata*, *B. o.* var. *acephala* and *Raphanus sativus*. This is the first report of natural parasitism of *P. brassicae* by these tachinid flies from Kashmir region. Earlier, Bhat *et al.*² reported the occurrence of 5 hymenopteran parasitoids of *P. brassicae* in vegetable ecosystems of Kashmir. Razmi *et al.*¹⁰ have reported 2 sp. of *Exorista* such as *Exorista segregate* and *Exorista larvarum* attacking *P. brassicae* from Iran. Mushtaque and Mohyuddin⁸ report the occurrence of parasitoid *C. cocinnata* on *P. brassicae* in Pakistan.

Results showed (table-1) that the overall rates of parasitism by *E. larvarum* in the collected pest samples remained quite low in the range of 0-1.9% in year 2006 and 0-1.4% in year 2007. Like wise, the rates of parasitism by *C. cocinnata* Meign in the collected pest samples were also found low in the range of 0-2.7% in year 2006 and 0-1.7% in year 2007. The parasitism of *P. brassicae* by said parasitoids was observed from last week of May to last week of August, and highest level of parasitism was recorded in the month of July.

Table-1. Weekly percentage of parasitism of *P. brassicae* by parasitoids, *E. larvarum* and *C. cocinnata* recorded in vegetable eco-systems during 2006-2007

Month / week	%age parasitism by <i>E. larvarum</i>		% age parasitism by <i>C. cocinnata</i>	
	2006	2007	2006	2007
May				
I	0	0	0	0
II	0	0	0	0
III	0	0	0	0
IV	0.3	0.1	0	0.4
June				
I	1.9	0	0	0.5
I	0	0	0	0
III	0	0	0	0
IV	0.8	0	0	0
July				
I	0.9	1.4	0.2	0.09
II	0.5	0.5	0	0
III	0	0	0	0
IV	0	0	2.7	1.7
August				
I	0	0	0	0
II	0.3	0	0.8	0.4
III	0.3	0	0.3	0
IV	0.1	0	0	0.03

The present work provided an opportunity to explore the possibility of utilizing the recorded parasitoids for biological control, after standardization of their rearing techniques in Kashmir Valley.

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