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## Preference of *Pieris brassicae* (Linnaeus) (Lepidoptera, Pieridae) on Different *Brassica* Genotypes under Field Conditions

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**Abstract:** An experiment was conducted at the student research farms of the University of Arid Agriculture, Rawalpindi during 1999-2000 to find out the preference of *Pieris brassicae* (Linnaeus) (the cabbage butterfly (CBF)) on different *Brassica* genotypes. (Cyclone, SPS-5, CON-III, CCS-01 Oscar, CON-II and K.S-75). It was inferred that CBF showed the highest preference to *Brassica* genotype cyclone and the lowest to CON-II. It was also concluded that CBF showed variations in preferring hosts of different varieties of *Brassica* spp. and this information could be helpful in evolving varieties of *Brassica* resistant against this serious pest of cruciferous plants.

**Key words:** Preferred host plants, *Pieris brassicae* (Linnaeus), *Brassica* genotypes, susceptible, edible vegetable oil, *Aphis brassicae*

### Introduction

Oilseeds and fats occupy very important position in human life. They form the ingredients of foods and flavours, cosmetics and condiments, soaps and detergents, lubricants and laxatives and what to speak of their medicinal and therapeutic values (Maurya, 1998). They play a significant role in the economy of Pakistan to meet the requirements of oil to some extent. The total requirements of edible oils are 1.5 million tonnes and out of this 0.538 tonnes are produced in the country and 0.99 tonnes are imported (Anonymous, 1997). Government of Pakistan spends more than 612 million dollars to import edible oils (Anonymous, 1998).

Rapeseed and mustard are successfully grown in many regions of Pakistan. They are grown for the edible vegetable oil. The crop of rapeseed and mustard is attacked at various stages of plant growth by a tremendous number of insect pests including *Lipaphis erysimi* (Kelt) and *Aphis brassicae* D. (the mustard aphids), *Athalia proxima* (Klug) (the mustard sawfly), *Bagrada cruciferarum* Kirk (the painted bug), *Phytomyza atricornis* Meigen (the leaf miner), *Agrotis ipsilon* (Hfn) (the cutworm), *Chrotogonus* sp. (the surface grasshopper), *Flutella xylostella* (the diamond back moth), *Phyllotreta cruciferae* (the flea beetle) and *Pieris brassicae* (Linnaeus) (the cabbage butterfly as the serious ones. CBF is very serious and destructive pest and causes severe damage to host plants and generally attacks leaves and inflorescence (Aslam, 1984, 1994; Fresher, 1997). Sometimes the attack is so severe that the whole crop is destroyed (Atwal, 1976). It is a cosmopolitan insect, so it is distributed all around the world wherever the cruciferous plants exist (Hill, 1987). The most preferred host plants for CBF are cabbage, cauliflower and *Brassica* spp. (Shah and Hashmi, 1994; Smith, 1951). Aslam (1994) reported that larvae of CBF inflict severe damage to cruciferous plant through voracious feeding, CBF Larvae feed exclusively on the plants of family cruciferae of which 15 species are reported to have been attacked (Dethier, 1947).

Aslam and Suleman (1999) reported that larvae of *Pieris brassicae* preferred radish crop, showed medium preference to cabbage and low preference to sarson and turnip. Keeping into view the seriousness of this pest, it was the need of the day to observe the preference of *Pieris brassicae* on different genotypes of *Brassica* under field

conditions, so that those genotypes could be selected for growing which are less susceptible to this pest and the same could be recommended to be incorporated in the breeding programmes so as to reduce the losses to this crop by this serious pest (CBF). Also the information thus gained may help evolve varieties of *Brassica* resistant against this serious pest of cruciferous plants.

### Materials and Methods

Studies on the preference of *Pieris brassicae* on different *Brassica* genotypes were conducted at the student research farms of the University of Arid Agriculture Rawalpindi during 1999-2000. The experiment was conducted in a Randomized complete Block Design with three replications. The seven *Brassica* genotypes including Cyclone, SPS-5, CON-III, CCS-01 Oscar, CON-II and K.S-75 were grown in different plots. The plot size was maintained as 3 in x 1.3 m. The row to row distance was maintained as 45 cm. All the agronomic practices were kept uniform in all plots. Five plants were selected randomly from each plot and were tagged properly. The larvae of *Pieris brassicae* from lower, middle and terminal parts of the selected plants were counted so as to get total number of larvae per plant. The observations were recorded on daily basis in the morning time. The data collected were analysed using MSTATC. LSD tests, as recommended by Benedict (1983) and Aslam *et al.* (1999, 2000) were applied to the means to compare the differences amongst them.

### Results and Discussion

There were significant differences among the different *Brassica* genotypes for the preference of *Pieris brassicae* (Table 1). Table 2 reveals that the preference of *Pieris brassicae* was significantly higher on *Brassica* genotype Cyclone and the lowest on CON-II. On Oscar, CON III, CCS 01, K.S. 75 and SPS-5, the number of the larvae found was intermediate. However, K.S. 75 and SPS-5 did not differ significantly from CON II in showing the number of larvae of CBF and Oscar, CON III and CCS 01 were similar statistically in that regard. Although the number of CBF larvae was highest on Cyclone but Oscar did not differ significantly from Cyclone in showing number of larvae of CBF. However it could be inferred from these studies that

Aslam *et al.*: Preference of *Pieris brassicae* on *Brassica* genotypes

Table 1: Analysis of variance Table

K Value	Source	Degree of freedom	Sum of square	Mean square	F Value	Prob
1	Replication	2	18.446	9.223	1.2432	0.3231
2	Factor A	6	340.201	56.700	7.6428	0.0015
3	Error	12	89.026	7.419		
	Total	20	447.672			

Table 2: Number of larvae of *Pieris brassicae* found on different *Brassica* genotypes in the field during 2000.

Genotypes	Mean No. of larvae found
Cyclone	16.98 A
Oscar	13.59 AB
CON-III	11.51 BC
CCS 01	10.79 BCD
K.S.-75	7.54 CDE
SPS-5	6.20 DE
CON-II	4.65 E

means followed by the same letters are not significantly different from one another at Alpha = 0.05, LSD = 4.816 genotype cyclone was the most preferred host for the *Pieris brassicae* whereas the CON-II was the least preferred one. Other Scientists also showed the preference of *Pieris brassicae* on different host plants. Shah and Hashmi (1994) and Smith (1951) reported that the most preferred host plants for *Pieris brassicae* were cabbage, cauliflower and *Brassica* spp. Aslam and Suleman (1999) reported that the larvae of *Pieris brassicae* preferred radish crop, showed medium preference to cabbage and low preference to sarson and turnip. Bhalla *et al.* (1997) reported that late cultivars with green leafy stage coinciding with period of pest activity were preferred by larvae of *Pieris brassicae* while early maturing cultivars were not preferred. Khattak *et al.* (1982) reported that cabbage was the most preferred host for the larvae of *Pieris brassicae*, whereas toria was the least preferred one. Rehman (1969) stated that the mean pupal weight varied significantly with change of food plants. It means that the host plants which give maximum pupal weight will be preferred by the *Pieris brassicae*. The reason why the *Pieris brassicae* preferred brassica genotype cyclone may be attributed to the fact that cyclone leaves were more tender as compared to leaves of CON-II.

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