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Short Note

Incidence of the green peach aphid [*Myzus persicae* (Sulzer)] on sweet pepper under greenhouse environment

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Abstract

Incidence of *Myzus persicae* (Sulzer) (Hemiptera: Aphididae), an economically important polyphaous species of aphids, was recorded on *Capsicum annuum* L. under greenhouse environment in different parts of Himachal Pradesh. The aphid was observed to infest the crop at seedling, flowering and fruiting stages at all the locations. The incidence varied from 19.25 to 68.95, 42.25 to 73.25, 37.58 to 74.85 and 30.56 to 88.54 per cent in Bilaspur, Hamirpur, Kangra and Mandi districts, respectively. High incidence of the aphid on *C. annuum*, under greenhouse environment thus warrants careful considerations for its management.

Key words: Incidence, *Myzus persicae, Capsicum annuum,* greenhouse.

The green peach aphid, *Myzus persicae* (Sulzer) (Aphididae: Hemiptera) is a polyphagous species of aphids with worldwide distribution which has been reported to feed on more than five hundred host plants (van Emden and Harrington, 2007). Both nymphs and adults suck the vital cell sap from various parts of the plant thereby inducing premature senescence. It also excretes honeydew on which sooty mould grows which inhibits the photosynthesis. In addition to direct losses, the aphid is also capable of transmitting more than one hundred and fifty viral diseases in different hosts particularly Solanaceous vegetables (Cloyd and Sadof, 1998).

M. persicae is one of the most important insect-pests of crops grown under greenhouse environments (Sanchez *et al*., 2010, Mehta, 2012). The practice of growing many suitable host-plants of the aphid in greenhouses has provided very congenial conditions for the aphid to survive and multiply round the year under protected environments in areas with inclement weather. The aphid being an important vector of viral diseases can be very serious even at very low population levels, therefore, regular monitoring of its population is very essential and foremost step in order to devise an effective management strategy for this pest. In the present study, the incidence of *M. persicae* was recorded on sweet pepper, *Capsicum annuum* L. grown under greenhouse environment in different parts of Himachal Pradesh, India.

Surveys were conducted to record incidence of *M. persicae* on sweet pepper, *C. annuum* grown under greenhouse environment by the farmers in four districts *viz*. Bilaspur, Hamirpur, Kangra and Mandi of Himachal Pradesh. The per cent incidence of *M.*

persicae was recorded during July, September and December, 2011 at seedling, flowering and fruiting stages of different varieties of *C. annuum* in ten greenhouses at different locations in each of the four districts. For this purpose, fifty plants of the crop were randomly selected in each greenhouse at different growth stages of the crop. Three leaves on the top canopy of each selected plant were observed with the use of 20X magnifying lens for the presence of nymphs and adults of the aphid. The plants having even a small number of aphids (less than ten) were counted as aphid infested plants. From these counts the per cent incidence of the aphid was calculated by using the following formula:

$$\text{Per cent incidence (\%)} = \frac{\text{Number of Infested plants}}{\text{Total Number of plants observed}} \text{X100}$$

The incidence of *M. persicae* on the crop was recorded under greenhouse environment in all the four districts surveyed during the present study. The aphid was observed to infest the crop at seedling, flowering and fruiting stages at all the locations from July to September. The per cent incidence, at different stages of the crop, varied from 19.25 to 68.95, 42.25 to 73.25, 37.58 to 74.85 and 30.56 to 88.54 in Bilaspur, Hamirpur, Kangra and Mandi districts, respectively (Table 1). The incidence of the aphid was high in Mandi district whereas, it was low in Bilaspur. The maximum incidence of the aphid was observed in the month of September on the seedling and flowering stages of the crop in all the districts. It was 68.95, 73.25, 74.85 and 88.54 per cent in Bilaspur, Hamirpur, Kangra and Mandi districts, respectively. The variations in the incidence of the aphid at different locations may be explained on the basis of varied agro-climatic conditions prevailing in different districts in general and differences in the temperature and RH in the greenhouses maintained by different farmers in particular. The incidence of the aphid was observed to be more in greenhouses which were not maintained properly.

Earlier *M. persicae* has been reported to infest many important crops *viz*. sweet pepper, tomato and cucumber under greenhouse environments in Himachal Pradesh (Vashisth, 2009). The aphid has also been reported as a major pest of sweet pepper under greenhouse conditions in other parts of the world (Tatsumi and Takada, 2005; Perdikis *et al.,* 2008). Round the year availability of preferred secondary hosts of the aphid, its minute size, high reproductive potential and presence of migratory alate forms and favourable microclimatic conditions

Table 1. Incidence of *M. persicae* on *C. annuum* under greenhouse environments in different parts of Himachal Pradesh

District	Period of observation	Crop stage (s)	Incidence* (%)
Bilaspur	July	Flowering, fruiting	19.25 (18- 22)
	September	Seedling, flowering	68.95 (68-70)
	December	Fruiting	52.65 (48-55)
Hamirpur	July	Flowering, fruiting	42.25 (40- 45)
	September	Seedling, flowering	73.25 (70- 75)
	December	Fruiting	62.24 (58- 65)
Kangra	July	Flowering, fruiting	37.58 (35-40)
	September	Seedling, flowering	74.85 (75-80)
	December	Fruiting	42.23 (40-45)
Mandi	July	Flowering, fruiting	30.56 (28-35)
	September	Seedling, flowering	88.54 (86- 90)
	December	Fruiting	41.23 (40-42)

*Average of 10 greenhouses, Figures in parentheses indicate range

under the greenhouse environments are some of the factors which may explain the high incidence of *M. persicae* on sweet pepper in different parts of the state as recorded in the present study. This may have serious implications for the successful cultivation of sweet pepper, one of the most remunerative cash crops for the farmers practicing greenhouse cultivation. Of late, cultivation of vegetables and ornamental plants under greenhouse environment has emerged as an important venture among farmers of Himachal Pradesh as a result of the state sponsored schemes with incentives in the form of subsidies for the farmers adopting protected cultivation. However, the problem of insect-pests of greenhouse crops is one of the major concerns of the farmers, researchers and policy makers for the success of this ambitious programme. High incidence of *M. persicae*, an efficient vector of plant viruses, may pose serious threat to the greenhouse famers. The solution of this problem cannot be found in the use of pesticides only as the aphid is also known to have developed resistance to several insecticides in many parts of the world (Foster *et al*., 2000). Therefore, there is an urgent need to have careful considerations for adopting proper management strategy against the aphid based on population monitoring and ecological principles.

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