ECOLOGICAL SUCCESSION OF APHIDS AND THEIR NATURAL ENEMIES OF CAULIFLOWER

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Abstract

Four species of aphids Viz, Myzus persicae, Lipaphis erysimi, Brevicoryne brassicae Linn. And Aphis gossypii were found infesting cauliflower. The population of the first two aphids was found dominating and their period of occurrence was more or less similar. The infestation of B. brassicae started only in the later stage of the crop and followed by colonization up to harvest were as A. gossypii occurred in all the crop varieties but the colonization of the aphids were correlated with the biotic factors (predators and parasites) in order to study their effect on aphid density.

Keywords: *Ecological succession, Aphis gossypii, Brevicoryne brassicae, Lipaphis erysimi, Myzus persicae, parasitoids, predators.*

Introduction

Cauliflower, widely cultivated in Bihar and U.P. severely attack by aphids. Seasonal incidence biology and relation of the aphids with biotic factors in other cruciferous crops has been studied by Tandon et. al. (1977), Ghosh & Mitra (1983) Chandra & Kushwaha (1986, 1987), Sachan and Gangwar (1990), Roy and Pnade (1991). However its seasonal incidence and succession on cauliflower is not known in Bihar. Therefore the present study was conducted.

Materials And Methods

Observation on the incidence of the aphid along with natural enemies on the cauliflower was carried out during season 2012-2013 and 2013-2014 the abundance of the aphids as well as the natural enemies were monitored at weekly interval from the plots which were kept free from the application of insecticide. Population assessment of the insect was made by direct counting from the three leaves randomly selected from the upper middle and lower whorls of the plant (Chaurch & Strickland, 1994). Simple correlation analysis was worked out between the aphid population and biotic factors (predators and parasitoids) to study their influence on aphid density.

Result & Discussion

The study revealed the occurrence of four species of aphids viz. Myzus persicae, Lipaphis erysimi, Brevicoryne brassicae Linn. And Aphis gossypii Glover on cauliflower crop with varied incidence pattern and numerical abundance in different month of the year. The weekly counts of the aphids in the two consecutive crop seasons 2012-2013 and 2013-2014, the data were transferred to Q (X + 1) transformation. The simple correlation of aphid population with biotic are shown in Table – 1.

he M. persicae incidence initiated from second week of November, (2012-2013) and third week of October (2013-2014) when the plants were transplanted. Its population gradually increased with fluctuating density and attained its peak of about 169

aphids per three leaves during the last part of January (2012-2013). However in the year, (2013-2014) the population remained very low throughout the crop period Lerysimi appeared during the first week of December (2012-2013) and the third week of October (2013-2014). The population intensity remain very low during (2012-2013) but in (2013-2014) the population started to build up gradually and recorded a peak of about 23 aphids per three leaves during third week of November. Therefore the population declined. No infestation of A. Gossypii was recorded during (2012-2013) but in (2013-2014) its infestation started from the second week of October of third week of November with low intensity. Infestation of B. brassicae was first observed during February when the crop attained maturity. However this aphid was not observed in (2013-2014)

Table – I
Correlation of aphid population with respect to biotic factors on cauliflower

Aphid Species	Syrphids	Parasitiods	Coccinellids
M. persicae	0.94	0.31	0.06
L. erysimi	-0.34	0.09	0.08
A. Gossypii	0.16	-	0.09
B. brassicae	0.17	-	0.40

Conclusion

The natural enemies found associated with the aphid colonies were syrphid flies, coccinellid beetles and parasitoids. Five species of syrphid flies Viz. Episyruphus balteatus De Geer., Ischiodon scuterllaries Eabr., Sphaerophoria Indiana Big, Metasyrphus confrator weid and Betasyrphus seranius weid, three species of coccinellid viz., Coccenella septempunctata Linn., C. Tranversalis Linn, and Menochilus sexmaculatus (F.) and two species of parasitioids., Diaeretiella rapae, and Aphidus matricariae were recorded during the period of aphid infestation. The E. balteatus, C. septempunctata and D. rapae were observed in the crops all the ten species of natural enemy complex were found. The pattern of their incidence showed similar trend with that of the aphids. However their distribution was sporadic in nature and occurred in very small numbers during the observation period.

Relative humidity showed significant relation only with M. persicae among the biotic factors, significant density dependent prendent predation of M. persicae was observed by the syrphids whose potential as aphid predator was also recognized by other workers (Kotwal et. al. 1984: Shantibala et. al 1994) and their use in Integrated Pest Management has been recommended (Sharma and Adlakha, 1981).