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Predation rates of *Coccinella septumpunctata* Linnaeus and *Chilocorus infernlais* Mulsant on aphids

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The functional response of the *Coccinella septumpunctata* Linnaeus and *Chilocorus infernalis* Mulsant to increase the predatory potential of aphids and numerical response with fixed density of prey (aphids) and increasing densities of *C. septumpuctata* and *C. infernalis* were examined. The functional response curve having a curvilinear rise to plateau as prey densities increased from 1 to 64 and curve predicted by the Holling disk equation did not differ significantly from the observed functional response curve. The rate of successful search and the handling time predicted by disk equation were 0.0566 and 1.473 in case of *C. septumpuctata* and 0.0602 and 2.833 in case of *C. infernalis*, respectively. The numerical response having a linear rise to a plateau as aphid density fixed (20) with varying densities of *C. septumpuctata* and *C. infernalis* from 1to7. this response is consist with the view the *Coccinellids* as a group was involved under condition of food limitation and rate of attack was also decrease with interference of other C*occinellids.*

Key word : *Coccinella septumpunctata*, *Chilocorus infernalis*, Functional response, Numerical response and Aphid.

INTRODUCTION

Around the world about 420 genera and 5500 species of *Coccinellids* have been recorded, while In India, 401 species belonging to 79 genera have been recorded so for (Poorani, 2002). Worldwide, these have 155 attempts to control aphids by introducing ladybirds (Joshi *et al.*, 2003). The out come of these attempts indicate that effectiveness of aphidophagous ladybird beetles (Dixon and Kindlmann.1998).

The ladybird beetle, *Coccinella septumpunctata* Linnaeus and *Chilocorus infernalis* Mulsant is natural predator of the aphids in Kashmir. During the month of June-July this beetle reached high population level which aided significantly in reducing aphid infestations. Hence, as prey population increase in numbers, the predation pressure exerted on them must increases well. The reverse is also true: predator pressure should relax with decreases in prey populations' increase in numbers. Thus, the greater the importance of a given prey to the diet of the predator, the lower the population size at which the predator will effect control (Huffaker and Messenger, 1964). Density-dependent predation is affected by two characteristics of the predator: (i) Feeding behaviour (the functional response) and (ii) Densities (the numerical response) (Huffaker *et al.*, 1971). A response has three essential components: the exposure of preys to predators, instantaneous attack rate and the handling time required for each prey (Hassell *et al*., 1976, Holling, 1959). This paper presents the predation rate of (functional and numerical response) of *Coccinellids* on aphids.

MATERIALS AND METHODS

The response of *Coccinella septumpunctata* Linnaeus and *Chilocorus infernalis* Mulsant adults exposed to aphids were assessed in the laboratory (60-80% humidity, 17—29^{0}C temperature). The *Coccinellids* captured from fields and starved for two days. The aphids were collected from Eunonymous hedge and maintained culture in cage (25x25x25 cm) for experiments. Twenty four hour before the experiments, aphids were introduced in separate cage. The functional response was evaluated at densities of 1,2,4,8,16,32,64 aphids per predator per cage and numerical response was evaluated at fixed densities 20 aphids with varying densities of predators was 1,2,3,4,5,6,7 per cage. The experiment lasted for 24 hrs for each three replication.

The differences in the two response curves are possibility related to the substrates on which the experiments were preformed. Holling's disk equation (Holling, 1959, 1965, 1966, Hassell *et al.*, 1976) for type II functional response can be written as

$$Na = aT_t N/1 + a Th N \text{.....[1]}$$

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