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DIVERSITY OF PREDATORS AND MANAGEMENT OF *APHIS ODINAE* (VAN DER GOOT) IN CASHEW

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ABSTRACT

Field experiments were conducted to assess the diversity, abundance and role of aphidophagous predators in cashew during 2015 and 2016 at Goa. The aphid *Aphis odinae* (=*Toxoptera odinae*) (Van der Goot) is an occasional sporadic insect pest of cashew. The aphid was preyed upon by six species of predators, including three species of coccinellids, viz., *Scymnus castaneus* Sicard, *Cheilomenes sexmaculata* (F.) and *Pseudaspidimerus flaviceps* (Walker) and three species of syrphids, viz., *Paragus serratus* (F.), *Dideopsis aegrota* (F.) and *Ischidon scutellaris* (F.). Among these, *S. castaneus* (11.05 grubs/nut/leaf) was the most abundant followed by *P. serratus* (5.02 larvae/nut). Their populations followed an almost similar trend with that of the prey aphid with maximum populations being observed during 6th standard meteorological week. Significant positive correlation was observed between the aphid and the predators except for *I. scutellaris*. These predators were effective in managing the aphid.

Key words: Cashew, *Aphis odinae*, predators, coccinellids, syrphids, abundance, seasonal incidence, correlation coefficients, population dynamics

Cashew (*Anacardium occidentale* L., Family: Anacardiaceae) is one of the economically important commercial plantation crops in India. It is affected by more than 60 species of insect pests in India (Pillai et al., 1976; Maruthadurai and Singh, 2015). The mango aphid, *Aphis odinae* (=*Toxoptera odinae*) (Van der Goot) (Hemiptera: Aphididae) is a polyphagous, occasional sucking insect pest. It has a broader host range and feeds on trees and shrubs of more than 45 plant families (Blackman and Eastop, 2000). It is widely distributed in eastern and south eastern Asia and Africa (Barbagallo and Santos, 1989; Martin, 1989). Recently sporadic occurrence of *A. odinae* was observed on leaves and nuts of cashew. Its heavy infestation leads to shedding and drying of inflorescences or distorted and malformed nuts and apples. The damage was heavier on young plantations (Maruthadurai and Singh, 2017). Knowledge of the diversity of natural enemies is important in biological control and for ecofriendly IPM. Therefore, the present study on the diversity and abundance of aphidophagous predators of *A. odinae* in cashew.

MATERIALS AND METHODS

The present study was carried out at the experimental farm of ICAR-Central Coastal Agricultural Research Institute, Ela, Old Goa, Goa ($15^0$29'N, $73^0$55'E) during 2015 and 2016. The plantation was eight years old with various varieties and hybrids, and maintained without any insecticides, but following all the recommended agricultural practices. Twenty trees were randomly selected as samples with observations made on the incidence of aphids and its predators. These observations were made starting from the initial appearance of aphis to up to nil populations at weekly intervals. Observations were made on leaves, shoots, inflorescences of apple and nuts on all four sides quadrants (north, south, east and west) of marked trees. Grubs, larvae and adults of predators were identified with available keys (Poorani, 2002). Mean population of *A. odinae* and its predators/leaf/nut was calculated and relative density was computed as given below:

$$\text{Relative density (RD)} = \frac{\text{Number of individual of one species}}{\text{Total number of individual of all species}} \times 100$$

Shannon-Weiner index of diversity, Mergalef Richness Index and Berger-Parker index of dominance were computed as given below:

Shannon- Weiner diversity index (H') = $-\sum$ pi ln pi, where, pi- Proportion of the i^{th} species, and ln pi- natural logarithm of pi.

Margalef richness index = $\frac{S-1}{\ln N,}$ where, S - Species number (S), and ln N - Logarithm of the total number of individuals (N); and Berger-Parker dominance