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Research Note

Biological suppression of *Planococcus citri* (Risso) (Homoptera: Pseudococcidae) on *Crossandra undulifolia* Salisb. in India

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ABSTRACT: The citrus mealybug, *Planococcus citri* (Risso) (Homoptera: Pseudococcidae) was observed infesting *Crossandra undulifolia* Salisb. in 2006 at the Indian Institute of Horticultural Research Farm, Bangalore. It is a new host plant for the pest in India and elsewhere. Since the application of conventional insecticides fails to control the mealy bugs, possibilities of its biological control were explored on crossandra. A total of 500 larvae of the Australian ladybird beetle, *Cryptolaemus montrouzieri* Mulsant were released in an area of 100 sq. metre planted with crossandra. Following the release of *C. montrouzieri*, the plants were almost cleared of the mealybugs after 3 months. Since the weather parameters such as maximum and minimum temperatures, relative humidity and rainfall did not show any significant relationship with the citrus mealybug population on crossandra, the decline in the mealybug population was attributed to the activity of the biotic agents, chiefly *C. montrouzieri*.

KEY WORDS: *Crossandra undulifolia*, *Cryptolaemus montrouzieri*, *Planococcus citri*, predator

Six species of insect pests are known to attack *Crossandra undulifolia* Salisb. in India (Jhansi Rani, 2001). During 2006, several crossandra plants were found severely infested with the citrus mealybug, *Planococcus citri* (Risso) (Homoptera: Pseudococcidae) at the Indian Institute of Horticultural Research Farm, Bangalore North. The mealybugs suck the sap from the leaves, stem, tender spikes, spikelets and developing buds. Heavy mealybug infestation was observed on lower surface of leaves and inside the spikelets, and they excrete honeydew leading to the development of sooty mold interfering with the photosynthetic activity of the plants. *P. citri* is highly polyphagous, but *Crossandra undulifolia* appears to be a new host plant for *P. citri* in India and elsewhere (Scale Net, 2007). Application of insecticides such as dimethoate (0.05%) and monocrotophos (0.05%) failed to control the mealybugs on crossandra. Since the insecticides are not effective, possibilities of its biological control were explored.

Planococcus citri was observed in severe form on crossandra in September 2006 in an experimental plot of 100 m^2 at IIHR Farm. *Cryptolaemus montrouzieri* Mulsant was multiplied on *P. citri* - infested pumpkin fruits (*Cucurbita moschata* Linn.) as described by Chacko

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Table 1. Population of citrus mealybug *P. citri* and *C. montrouzieri* on crossandra

Date of observation	Population (Mean ± S.D)		Reduction in mealybug population(%)
	Mealybugs / plant (per 4 shoots)	*C. montrouzieri* / plant	
26-10-2006	99.80 ± 12.10	-	-
10-11-2006	87.40 ± 10.15	5.24 ± 4.98	12.42
25-11-2006	74.25 ± 7.25	4.58 ± 1.45	25.60
09-12-2006	52.50 ± 4.86	6.54 ± 2.14	47.40
24-12-2006	43.46 ± 3.57	5.38 ± 1.86	56.45
10-01-2007	12.28 ± 1.42	3.71 ± 1.14	87.69
25-01-2007	6.85 ± 0.96	2.46 ± 0.50	93.13
10-02-2007	1.52 ± 0.48	0.94 ± 0.54	98.47

S.D Standard deviation

et al. (1978) at 26°C and 60-70% RH in the laboratory. A total of 500 larvae were released on the mealybug infested crossandra plants in the last week of October 2006. Subsequent to the release, the population of mealybugs, *C. montrouzieri* and other natural enemies, if any, were observed at about 15 days interval on 20 randomly selected infested plants. Four shoots of 30 cm length were removed from each plant and brought to the laboratory. After counting the live mealybugs and predators, the samples were kept over the pumpkins in wooden cages to record the emergence of natural enemies, if any. During the study period, the mealybugs were found attacked by other coccinellid predators, namely, *Brumoides suturalis* (F.) and *Cheilomenes* (=*Menochilus*) *sexmaculata* (F.) in negligible numbers. During October 2006 – February 2007, sampling of crossandra plants infested with *P.citri* did not yield any parasitoid, though several parasitoids were reported on *P.citri* infesting acidlime, pomegranate, guava, sapota, etc. in India (Krishnamoorthy and Singh, 1987; Mani, 1994 a & b) and elsewhere.

The results on the population trend of *P.citri* on crossandra plants revealed a mean of 99.80 mealybugs / plant on 26th October 2006. Following the release of *C. montrouzieri*, the mealybug population declined to 74.25 / plant on 25th November 06 and 43.46 / plant on 24th December 2006. The plants were almost cleared of the mealybugs in the second week of February 2007 (Table 1). *C. montrouzieri* was found feeding on the citrus mealybugs throughout the study period. Since the weather parameters such as maximum and minimum temperatures, relative humidity and rainfall did not show any significant relationship with the citrus mealybug population on crossandra, the decline in the mealybug population was attributed to the activity of the biotic agents, chiefly *C. montrouzieri*.

In the present investigation, a mean of 93.13% reduction in the population of *P.citri* was recorded three months after *Cryptolaemus* release on crossandra plants. The effectiveness of *C. montrouzieri* against *P. citri* infesting citrus in Australia (Wilson, 1960), South Africa (Greathead, 1971), and India (Mani and Krishnamoorthy, 2007) had been reported earlier.

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