

# **Preliminary Studies on the Inoculative Releases of Exotic ladybirds, *Cryptolaemus montrouzieri* Mulsant and *Scymnus coccivora* Aiyar Against the Hibiscus Mealybug, *Maconellicoccus hirsutus* (Green) in County St George**

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## **Abstract**

The effect of inoculative releases of an Australian Ladybird *Cryptolaemus montrouzieri* Mulsant and an Indian Ladybird, *Scymnus coccivora* Aiyar, recently introduced into Trinidad from India was studied. It was observed that the beetles have shown potential for establishment and are breeding well in Arouca, Tacarigua, Bamboo No.1, El Dorado and Tunapuna.

## **Introduction**

The introduction of the Hibiscus Mealybug (HMB) into Trinidad in 1995 was followed by a rapid spread of the pest throughout several parts of the island, including many areas in the county of St George.

With the importation of ladybirds, *Cryptolaemus montrouzieri* Mulsant and *Scymnus coccivora* Aiyar from India, and the subsequent multiplication of these coccinellid predators, it was decided to target key infested areas for inoculative releases. Thirty release sites were planned for this county, the boundaries being Arouca in the East, Aranguez/El Socorro in the West, Bamboo and Orange

Grove/Trincity in the South and St Joseph, Tunapuna and Tacarigua in the North.

## Materials and Methods

The ladybirds were reared at Central Experimental Station, Centeno following the method described by Gautam (1994 and 1996).

The following infested protected sites were identified within the villages chosen:

- Victoria Street, Arouca
- No.11 Eastern Main Road, Tacarigua
- Eastern Main Road, El Dorado
- Wilkinson Street, El Dorado
- Karamat Street, El Dorado
- Bamboo No.1.

Infested trees were randomly selected at different points on the compound and numbered as plants 1, 2 or 3 and tagged. On each plant, three sites 15 cm from the tip were selected and marked. A count of the mealybug population was taken and recorded.

A specified number of *C. montrouzieri* and *S. coccivora* adults and larvae was then released. The determination of the numbers released was based on the infestation levels present.

The first observation was made 10 days after inoculation. A count of the following were made on tagged sites:

1. number of HMB ovisacs with eggs
2. number of adult HMB females
3. presence or absence of HMB crawlers.

## Results

The inoculative releases made on all sites have revealed very encouraging and impressive results. The population of the Hibiscus Mealybug was recorded as very high before release. Observations noted on the population of mealybugs as well as ladybird predators are listed in Table I. After 10 days, the population of the mealybug had been arrested, with an average of 20% - 40% reduction in all areas. The successful trend of control was observed through Day 20 and Day 30 with as many as 100 larvae on one site being recorded at Arouca. By Day 45 the percentage control of the mealybug was noted between 80% - 99% with new growth being noticed in all areas.

The first observation on 23 March 1996, at Wilkinson street, El Dorado, recorded 25 larvae on the hibiscus plants actively feeding with an approximate 50% reduction in Hibiscus Mealybug infestation.

Also on 23 March 1996, 15 larvae were found feeding on a mango fruit at Karamat Street, El Dorado, with a 40-50% decrease in Hibiscus Mealybug infestation.

On 9 March 1996, 200 adults of *C. montrouzieri* adults and 200 *S. coccivora* adults were released at Bamboo No.1. Fifteen larvae, 4 *C. montrouzieri* adults and 1 *S. coccivora* adult were recovered from this site on 29 March 1996. An approximate 40-50% reduction in the HMB infestation levels was noted.

## Discussion

It is evident from the observations that between 30-45 days, the HMB population was brought down substantially by the recently introduced ladybirds from India. This is supported by Gautam et al. (1988) but is not in agreement with earlier reports on the introduction of *C. montrouzieri* into Trinidad from India during 1973 to suppress *Puto barberi* Ckll on avocado. At that time the predator did not establish itself. Similar efforts made by the CIBC in the past in the Caribbean (Bahamas, Barbados, Bermuda, Montserrat and St Kitts) also did not show any promise. (Alam, 1972, Cock, 1985).



Table 1 Releases and Recovery of Ladybirds and Control of the Hibiscus Mealybug for the Period 17 February to 19 March, 1996

Date of Release	Initial Level of HMB Infestation	Host Plants	No. of ladybirds Released			Recovery of ladybirds After				% Control of HMB Population After			
			CM(A)	CM(G)	SC(A)	10 Days	20 Days	30 Days	45 Days	10 Days	20 Days	30 Days	45 Days
17.02.96 Victoria St Arouca	+ 50 ovisacs + 50 adults	hibiscus chataigne soursop	20	200	-	9(G)	10(G) 2(P) 4(A)	100(G)	60(G) 40(P) 60(a)	40%	50%	70%	95% (NG)
09.03.96 Victoria St Arouca	+ 50 ovisacs + 50 adults	hibiscus	30	100	-	12(G)	20(G) 15(P) 10(A)	60(G) 10(P) 20(A)	30(G) 40(P) 10(A)	50%	70%	90%	99% (NG)
12.03.96 11 E.M.R. Tacarigua	+ 50 ovisacs + 50 adults	mango chataigne pawpaw	50	-	50	1(G) 8(P)	15(L)	3(P) 2(A)	10(L) 20(P) 2(A)	20%	40%	50%	80%
12.03.96 E.M.R. El Dorado	+ 50 ovisacs + 50 adults	soursop chataigne	25	-	25	38(G)	8(P)	2(P) 4(A)	15(G) 6(P) 8(A)	30%	40%	60%	80%
13.03.96 Karamat St El Dorado	+ 50 ovisacs + 50 adults	mango	25	-	25	7(G) 2(A)	25(G)	20(L)	25(G) 15(A)	20%	40%	50%	90%
13.03.96 Wilkinson St El Dorado	+ 50 ovisacs + 50 adults	hibiscus	25	-	25	25(G)	20(G) 6(A)	50(G) 10(A)	40(G)	40%	60%	70%	95%
19.03.96 Bamboo No.1	+ 50 ovisacs + 50 adults	chataigne soursop hibiscus	200	-	200	15(G) 2(A)	10(G) 8(P)	150(G) 10(A)	100(L) 200(P)	40%	60%	90%	99%

C.M. - *Cryptolaemus montrouzieri* S.C. - *Scymnus coccivora* HMB - Hibiscus Mealybug  
 G - Grub P - Pupa A - Adult  
 L - Larva N.G. - New Growth

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## References

- Alam, M. M. (1972) The establishment of *Anagyrus saccharicola* Timb (Hymenoptera: Encyrtidae) in Barbados, West Indies against the sugarcane mealybug, *Saccharicoccus sacchari* Ckll (Homoptera: Coccidae). *Entomophaga* 17 (4): 357-363
- Cock, M. J. W. (1985) A review of biological control of pests in the Commonwealth Caribbean and Bermuda up to 1982. Tech. Communication No. CAB International.
- Gautam, R. D. (1994) Biological Pest Suppression. Westville Publishing House, New Delhi.
- Gautam, R. D. (1996) A manual on multiplication and use of exotic ladybirds. Caribbean Agricultural Research and Development Institute (CARDI), St Augustine, Trinidad and Tobago. (in press).
- Gautam, R. D., Navarajan Paul, A. V. and Srivastava, K. P. (1988) Preliminary studies on *Cryptolaemus montrouzieri* (Muls.) against the white tailed mealybug, *Ferrisia virgata* Cockerall infesting tobacco plants. *Journal of Biological Control* 2(1): 12-13