



## Occurrence of papaya mealybug, *Paracoccus marginatus* Williams and Granara de Willink (Hemiptera: Pseudococcidae), on cotton

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**ABSTRACT:** The papaya mealy bug, *Paracoccus marginatus* Williams and Granara de Willink, was recorded in severe form on cotton in Coimbatore in 2008-09. Infestation leads to drying of the sympodial branches and both Bt and non-Bt cotton hybrids have been observed to be infested. *Spalgis epius* (Westwood) (Lepidoptera: Lycaenidae) was recorded as a predator on *P. marginatus* infesting cotton and other hosts like papaya, silk cotton, subabul, *Ixora* sp., Crotons, *Gliricidia* sp. and *Hibiscus* sp. The larvae of *S. epius* were found to be voraciously feeding on the egg masses, nymphs and adults of the mealybugs.

**KEY WORDS:** Cotton, papaya mealybug, *Paracoccus marginatus*, *Spalgis epius*

Mealybugs have recently emerged as major pests of cotton in all the cotton growing states of India and pose a severe threat to cotton cultivation in India. Apart from the two reported species, namely, *Phenacoccus solenopsis* Tinsley and *Maconellicoccus hirsutus* (Green), another species, the papaya mealybug, *Paracoccus marginatus* Williams and Granara de Willink, was recorded on cotton in Coimbatore in 2008. *P. marginatus* attacks several genera of host plants, including economically important tropical fruits and ornamentals. The papaya mealybug is believed to be native to Mexico and Central America. The first specimens were collected in Mexico in 1955. The papaya mealybug was described in 1992 from the Neotropical Region in Belize, Costa Rica, Guatemala, and Mexico (Williams and Granara de Willink, 1992). Since 1994, it has been recorded in many Caribbean countries, viz., St. Martin, Guadeloupe,

St. Barthelemy, Antigua, Bahamas, British Virgin Islands, Cuba, Dominican Republic, Haiti, Puerto Rico, Montserrat, Nevis, St. Kitts, and the U.S. Virgin Islands and in the Pacific region in Guam and the Republic of Palau.

Infestation of *P. marginatus* in Coimbatore was observed on arboreum and hirsutum species of cotton under field conditions. Severe infestation leads to drying of the sympodial branches and both Bt and non-Bt cotton hybrids have been observed to be infested. Ovisacs, nymphs and adults are firmly attached to the growing shoots and leaves which are not easily washed off by rain or wind. The mealybug infestation was observed as clusters of cotton-like masses on the leaf, squares and bolls. The mealybug feeds on the sap of the plants by inserting its stylets into the epidermis of the leaves, squares and bolls of cotton

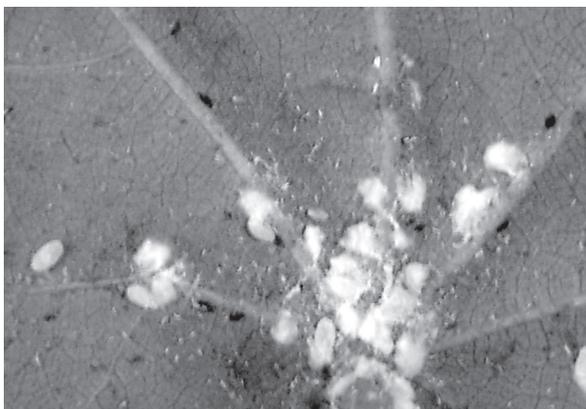


Fig.1. *P. marginatus* on leaf



Fig.2. *P. marginatus* on cotton stem & squares

plant. Due to the feeding, chlorosis, plant stunting, leaf deformation, early leaf drop, a heavy build up of honeydew and ultimate drying of the plant were observed. The adult female is yellow, covered with a white waxy coating and measures approximately 2.2 mm long and 1.4 mm wide. A series of short waxy caudal filaments less than one-fourth the length of the body exists around the margin. The eggs are greenish yellow and laid in an ovisac that is three to four times the body length and entirely covered with white wax. The ovisac is developed beneath the adult female.

### Management through biological control

A lycaenid butterfly, *Spalgis epius* (Westwood) (Lepidoptera: Lycaenidae) has been recorded as feeding on *P. marginatus* on cotton and other hosts like papaya, silk cotton, subabul, *Ixora* sp., crotons, *Gliricidia* sp., *Hibiscus*

sp., etc. The larvae voraciously feed on the egg masses, nymphs, and adults of mealybugs.

The adult of *S.epius* is a small butterfly with dark brown wings having a grey underside with dark striations. The butterfly flies rapidly and deposits the eggs in the mass of the mealybugs on the infested plants. The larvae are short, slug-like and covered with white waxy coating and the legs are short and hidden. The early instar larvae of the predator simulate mealybugs which makes it difficult to differentiate them among the host colonies. The pupa is light brown on the dorsolateral side and whitish grey on the ventral side. The first report of *S.epius* as a predator of mealybugs from India was by Aitken (1894). The predatory activity of *S.epius* on coffee mealybugs was reported from Andhra Pradesh (Anonymous, 1985), Tamil Nadu (Chacko, 1982 and Bhat, 1976), Kerala (Anonymous, 1982) and



Fig.3. Plant stunted due to *P. marginatus*

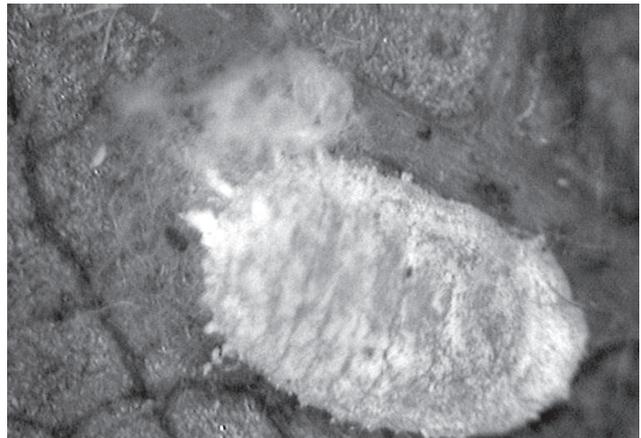


Fig.4. *P. marginatus* adult



Fig. 5. *P. marginatus* eggs

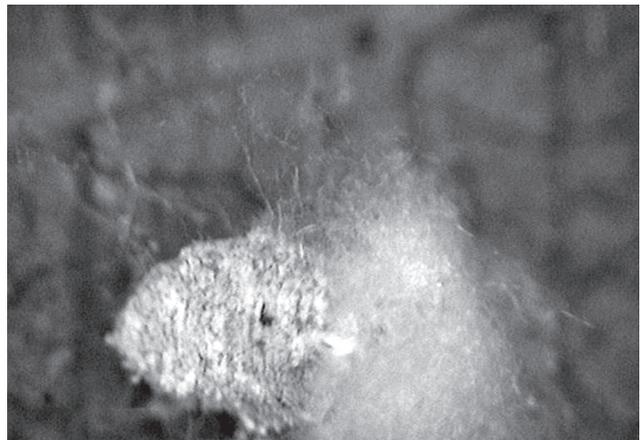


Fig. 6. *P. marginatus* adult with ovisac

Karnataka (Chacko *et al.*, 1977a; Prakasan *et al.*, 1987). In Southern India, *S. epius* has been reported to feed on *P. lilacinus* infesting citrus, pomegranate, ber and guava (Mani, 1995; Mani and Krishnamoorthy, 1996, 1998) and *M. hirsutus* (Pushpaveni *et al.*, 1973; Gowda *et al.*, 1996).

Though detailed biology of *S. epius* was studied by Vinodkumar *et al.* (2006) on *P. citri*, information on the predatory potential of the insect on mealybugs is scanty. Hence, the predatory potential of *S. epius* may be explored for exploiting it as a potential biocontrol agent for the management of *P. marginatus*. Possibilities of classical biological control through the introduction of parasitoids of *P. marginatus* from its native range also need to be explored as it has proved successful elsewhere in the world.

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### REFERENCES

- Aitken, E. H. 1894. The larva and pupa of *Spalgis epius* Westw. *Bombay Natural History Society Journal*, **8**: 485–487.
- Anonymous, 1982. Thirty-fifth Annual Detailed Technical Report (1981–82). Coffee Board Research Department, India. 198 p.
- Anonymous, 1985. Thirty-eighth Annual Detailed Technical Report. Coffee Board Research Department. India. 278 p.
- Chacko, M. J. and Bhat, P. K. 1976. Record of *Ferrisia virgata* and its natural enemy, *Spalgis epius* on coffee. *Journal of Coffee Research*, **6**: 56–57.
- Chacko, M. J., Bhat, P. K. and Ramanarayan, E. P. 1977. New records of Coccoidea with notes on natural enemies of *Planococcus* spp. on coffee in India. *Journal of Coffee Research*, **7**: 68–70.
- Gowda, D. K. S., Manjunath, D., Pradip Kumar, Datta, R. K. and Kumar, P. 1996. *Spalgis epius* Westwood (Lepidoptera: Lycaenidae) – a potential predator of mulberry mealybug, *Maconellicoccus hirsutus*. *Insect Environment*, **2**: 87–88.
- Mani, M. 1995. Studies on the natural enemies of the oriental mealybug, *Planococcus lilacinus* (Ckll.) (Homoptera: Pseudococcidae) in India. *Journal of Entomological Research*, **19**: 61–70.
- Mani, M. and Krishnamoorthy, A. 1996. Biological suppression of oriental mealybug *Planococcus lilacinus* (Ckll.) on ber. *Pest Management in Horticultural Ecosystems*, **2**: 49–50.
- Mani, M. and Krishnamoorthy, A. 1998. Biological control studies on the mango green shield scale, *Chloropulvinaria polygonata* (Ckll.) (Homoptera: Pseudococcidae) in India. *Entomon*, **23**: 105–110.
- Prakasan, C. B., Balakrishnan, M. M. and Vinod Kumar, P. K. 1987. Natural control of *Saissetia coffeae* Walker by *Coccophagus cowperi* Girault. *Journal of Coffee Research*, **17**: 47–48.
- Pushpaveni, G., Rao, P. R. M. and Rao, P. A. 1973. A new record of *Spalgis epius* Westwood as a predator of *Maconellicoccus hirsutus* Gr. on mesta (*Hibiscus sabdariffa* L.). *Indian Journal of Entomology*, **35**: 71.
- Vinodkumar, P. K., Vasudev, V., Seetharama, H. G., Irulandi, S. and Sreedharan, K. Biology and biometry of the lycaenid predator *Spalgis epius*. *Coffee Research*, **34**: 72–104.
- Williams, D. J. and Granara de Willink, M. C. 1992. *Mealybugs of Central and South America*. CAB International, UK, 1992, 644 pp.

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