Hot spot areas of coconut slug caterpillar and its integrated management in Andhra Pradesh

N.B.V.Chalapathi Rao , D. Rakshith Roshan , G.Ramanandam and H.P Maheswarappa *

Horticultural Research Station, Ambajipeta, Dr.Y.S.R.Horticultural University, East Godavari , Andhra Pradesh, * Project Coordinator AICRP on Palms , CPCRI, Kasaragod , Kerala

In Andhra Pradesh East Godavari, West Godavari, Srikakulam and Visakapatanam are important coconut growing coastal districts . One of the major factors that contribute to the loss of production and productivity in coconut is the damage due to the insect pests particularly coconut leaf eating caterpillars . In the major coconut growing districts viz., East and West Godavari districts the incidence of coconut slug caterpillar, *Macroplectra nararia* is being observed on a severe scale in various areas around the hot spot regions (Table 1) .

Damage

The damaging stage of the pest is caterpillar. Early instar caterpillars cause leaf spots due to feeding on the leaf tissue. Grown up caterpillars eat away entire laminar portion of the leaf leaving the mid ribs. Some times, balls of excreta will be seen as a layer on the ground around the coconut palm basin. In severe out break, the pest invades nuts and even leaf stalks. Drying of entire foliage, drooping of leaves and bunches, falling of buttons and nuts are ultimate symptoms of pest attack. The pest was observed

Slug caterpillar affected coconut garden

causing damage even to intercrops like banana/cocoa and surrounding hedge plants like agave after drying of coconut crop. In such cases falling of buttons and nuts, drying of total foliage leads to severe yield losses and spathe emergence will be delayed till the palm recovers.

Integrated management of slug caterpillar

Biological Control

During high incidence of slug caterpillar in East Godavari district in January 2013 two new larval parasitoids of coconut slug caterpillar *M.nararia; Euplectrus sp* and *Euplectromorpha sp* belonging to family *Eulophidae (Hymenoptera)* were identified (NBAII, Bengaluru) along with a pupal parasitoid *Eurytoma tatipakensis* (IARI, New Delhi). In March 2015 again severe incidence of slug caterpillar was observed in various villages in Tanuku ,Veeravasaram and Palakoderu mandals of West Godavari district and Rajanagaram mandal of East Godavari district of Andhra Pradesh and a new larval parasitoid *Pediobius imbrues (Hymenoptera: Eulophidae)* with a natural incidence ranging from 2-10 % was observed on the slug caterpillars in the pest affected gardens in these districts . Laboratory observations on the parasitisation of P. imbrues on slug caterpillar revealed that slug caterpillar larvae (0.6 to 0.8cm size) were effectively paralysed with in 48 to 72 hours and egg laying with 3 to 4 eggs in each paralysed larvae was observed . On caterpillars of earlier instars (less than 0.6 to 0.8cm size) and late instars (size above one cm) even though stinging and paralysation was observed no egg laying was recorded. Emergence of parasitoids progeny was observed from 12 to 15 days after parasitisation. Under laboratory conditions longevity of P. imbrues parasitoids ranged from 60 to 70 days.

Field Evaluation studies

The preliminary field efficacy study of P. imbrues (reared as hyper parasitoid on B.hebetor at biocontrol lab, H.R.S., Ambajipeta) on coconut slug caterpillar *M.nararia* was carried in Derbarevu village , Narsapuram Mandal in West Godavari district of A.P in one ha area of coconut garden affected by slug caterpillar in April 2017. Out of 150 palms affected by slug caterpillar 10 per cent of palms were sampled and from each palm 10 leaf lets from lower whorl were collected (total 150 leaflets) and 1400 numbers of P. imbrues parasitoids/ palm (Totaling to 21000 numbers) were released in the

Slug damage individual palm

Slug caterpillar larave parsitised by P.imbrues in lab

garden on 21.04.2017 and 01.05.2017. The per cent natural parasitisation of slug caterpillar by different parsitoids P.imbrues , Euplectrus sp and Euplectromorpha sp.was 2.10, 2.31 and 1.68 per cent before release of P.imbreus and after release the percent parasitisation of slug caterpillar by P.imbreus increased to 30.33 and 41.41 per cent exhibiting a significant effect on the population of M.nararia . The P. imbrues release did not affect the percent natural parasitisation by Euplectrus sp and Euplectromorpha sp and parasitisation by these two parasitoids on slug caterpillar also increased consequent to release of P. imbrues

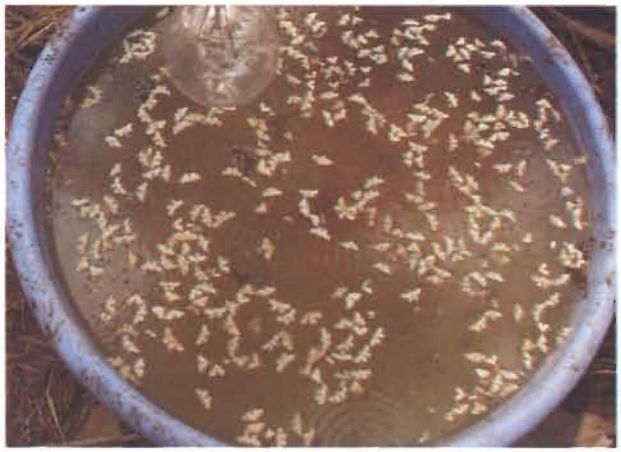
Studies on impact of light traps on slug caterpillar

Many of the insect species, mostly nocturnal, are known to be positively phototropic and attracted towards artificial light in large numbers.

Table 1 : Hot spot regions of Coconut slug caterpillar Macroplectra nararia infestation in East and West Godavari districts of Andhra Pradesh (2009- 2018)

	2009	2010	2012	2013	2014	2015	2016	2017	2018
Villages in East Godavari	Kadiyam	--	Kothapeta	Kothapeta	--	Kothapeta	Kothapeta	Kothapeta	
	Atreyapuram	--	Atreyapuram	Atreyapuram	Atreyapuram	--	Anthervedi	--	
		Ambajipeta	Ambajipeta	--	--	Ambajipeta	Ambajipeta	Ambajipeta	
	Sakhinetipalli	Sakhinetipalli	Aalamuru	Sakhinetipalli	--	--	Sakhinetipalli	--	
	Mamidikuduru	Mamidikuduru	I.Polavaram			I.Polavaram			
	Aallavaram	Aallavaram	Thallarevu		Alamuru	K.ganga-varam	Alamuru		Thallarevu
	Mumidivaram		Malkipuram	Malkipuram		Rajanaga-ram	Amalapuram	Amalapuram	
							Mummidivaram		
			Ravulapalem				Ravulapalem	Allavaram	
	P.Gannavaram						P.Gannavaram		
							Malkipuram	Malkipuram	
	Razole						Razole	Razole	Razole
						Uppalagup-tam	Uppalaguptam		
Villages in West Godavari	Palakoderu			Palakoderu	Palakoderu	Palakoderu		Tadepalligudem	
	Narsapuram	Narsapuram	Narsapuram	Narsapuram	Tadepalligudem	Pedavegi		Narsapuram	
	Palakollu	Palakollu	Palakollu	Undi		Palakollu	Palakollu	Palakollu	Palakollu
	Polamuru	Poduru		Yelamanchili	Poduru	Atthili	Poduru		
	Veeravasaram			Penumantra		Veerav-asaram	Achanta	Veeravasaram	
	Yelamanchili					Ganapa-varam	Yelamanchili	Yelamanchili	
			Undrajavaram			Penuman-tra		Undrajavaram	Bhima-varam
			Rambilli (Visakha patanam district)		Nakkapalli (Visakha patanam district)	Tanuku			

Active participation by farmer friends in Light trap experiments



Adult moths trapped by light traps

In plantations of coconut where application of pesticides is laborious use of light traps holds much promise against out break pests like slug caterpillar. The studies with light traps against the slug caterpillar revealed the following facts.

- Among the various light traps with different light intensities tested against, coconut slug adult moths M .nararia 200 W Incandescent bulb is the best light intensity bulb treatment and trapped highest number of moth catches and was followed by 500 W Incandescent bulb .
- Cumulative results of the studies with best intensity light source 200 W in candescent bulb different types and heights of light traps viz., 1 ½' above + sticky trap, 1 ½' above + Water pan, 4' above+ window bucket and 10' above+ window bucket at all five experimental sites revealed that more moth catches were observed in the trap installed at 1 ½' above + Water pan trap and was followed by 1 ½' above + sticky trap .
- Studies with the number of traps to be installed for effective trapping viz., one trap/ha., two traps/ ha. and three traps/ ha. with best intensity light source and best trapping method (200 W incandescent bulb 1 ½' above + Water pan) studied at all the experimental sites revealed that installation of three traps/ ha has trapped highest numbers of adult moths as compared to two and one trap/ha
- The standard light traps i.e., U.V. light trap (Metallic) and U.V. light trap (Acrylic) when tested for their efficacy in attracting slug adult moths were also found to be effective in trapping the moths .
- Regarding male and female moth catches more number of female moths were attracted to the light traps in comparison to the male moths .
- Studies on peak time of moth attraction towards the light source revealed that moths got attracted from 19.00 hours onwards and attained peak in between 21.00 to 01.00 hours and gradually decreased to nil at 03.00 hours.

Based on above observations and results of effective parasitisation of slug caterpillar by P. imbrues even under field conditions it can be inferred that P. imbrues is a primary parasitoid on slug caterpillar M. nararia in coconut plantations .Therefore mass multiplication and releasing of P. imbrues in coconut slug caterpillar out break areas and installation of lights traps is highly profitable as it is difficult to adopt chemical control measures for the management of this pest due to the residual toxicity and limitations of large scale adoption of pesticidal recommendations. ■