

INCIDENCE OF INVASIVE BANANA SKIPPER, *ERIONOTA TORUS* EVANS (LEPIDOPTERA: HESPERIIDAE) IN KARNATAKA

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ABSTRACT

Banana skippers, *Erionota* spp. (Lepidoptera: HesperIIDae) also called as banana leaf roller or palm redeye are a native of South East Asia and spread from South East Asia to Papua New Guinea. They are serious defoliators of banana in East Asian countries. Karnataka were surveyed for banana skipper incidence *Erionota torus* (Lepidoptera: HesperIIDae). *E. torus* infestation was recorded in seven of the nineteen villages surveyed with infestation ranging from 1.25% -100%. On average skipper damage of 23.71 % was recorded. Widespread and moderate levels of damage preclude that skipper is an emerging pest on banana in South India.

INTRODUCTION

Banana skippers, *Erionota* spp. (Lepidoptera: HesperIIDae) also called as banana leaf roller or palm redeye are a native of South East Asia and spread from South East Asia to Papua New Guinea (Figure 1). They are serious defoliators of banana in East Asian countries (Okolle *et al.*, 2006). Banana skipper caterpillars feed on banana leaves and rolling up the margins. The caterpillars can damage 60% of the plant leaf area. Leaf damage lowers banana yields due to delayed fruit maturity and reduced bunch size. According to Chiang (1988) the skipper infestation rates were higher in spring and autumn-winter seasons and ranged from less than 5% to higher than 20% at different areas in Taiwan. In India it was reported only from far North Eastern states like Manipur (Prasad and Singh, 1987; Singh, 1997), Assam (Deka *et al.*, 1996) and from Andaman and Nicobar Islands (Veenakumari and Mohanraj, 1991) to peninsular India. This pest has not been reported from this region either as a major or as a minor pest on banana. *E. thrax* was noticed to infest ornamental banana species, *M. ornata* besides Cavendish variety by Dake *et al.* (1996) in Assam. During 2012-13, a sporadic pest outbreak was noticed in Northern Districts in Kerala and spread across the state within a year (Sivakumar *et al.*, 2014).

Taxonomically two different species of *Erionota* viz., *Erionota thrax* and *Erionota torus* Evans, 1941 – Rounded (Palm-redeye) co-exist in India, the former's distribution range is North India and latter known to occur in South India. *E. torus* has prominence in South India, having sudden sporadic incidence in recent times (Pers. Comm. Dr. C.A. Viraktamath). Severe infestation of *Erionota* species in Dakshina Kannada, Udupi,

Kodagu and Chitradurga (The Hindu, 2014 a, b) was reported in 2014 and remains a serious threat to banana plantations in Mysuru region, Belgaum, Bagalkot, Koppal and the coastal belt of Karnataka (The Hindu, 2015).

The banana crop is cultivated in 53,000 ha in Karnataka producing 7.66 per cent (2.28 million tonnes) of the country's produce (The Hindu, 2015). Field investigations were carried out to report the areas affected in Southern plains of Karnataka and evaluate the extent of damage by the pest.

MATERIALS AND METHODS

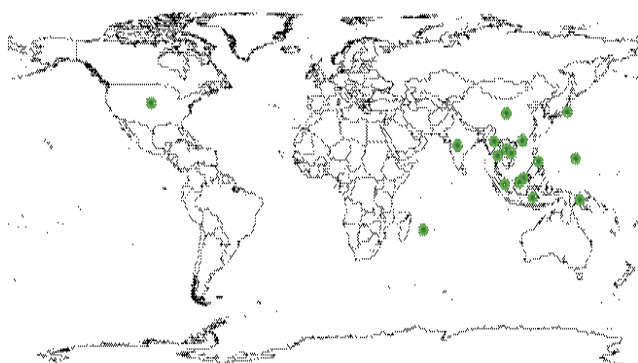
Infestation on different varieties was recorded by following roving survey technique in survey area. A roving survey in districts of Southern plains of Karnataka viz., Bengaluru Urban, Bengaluru Rural and Chikkaballapura taluks was undertaken to detect the incidence of *E. torus* during 2014. Leaf damage was recorded based on visual observation and opinion of farmers in managing the pest was recorded. As the number of plants under each variety varied in the survey area, the percent infestation was calculated based on number of leaves infested divided by total number of leaves into 100.

RESULTS AND DISCUSSION

Nineteen villages were surveyed in six taluka belonging to three districts in Southern Karnataka. In addition to field plantations infestation in household gardens were also accounted. *E. torus* infestation was observed in seven of the nineteen villages' infestation ranged from 1.25% -100%. On an average skipper damage up to 23.71 % was recorded

Table 1: Infestation of *E. torus* on banana plantations in the study area

Sl.No	Village Name	Lat-Long Co-ordinates	Percent infestation	Taluk	District
1	B.K. Halli	N 13°10' 07 E 77°41' 21	0	Bengaluru North	Bengaluru Urban
2	Mylanahalli	13°11' 0.4 77°42' 0.4	1.67		
3	Baladhimanahalli	13°11' 25.7 77°44.34.8	0	Devanahalli	Bengaluru Rural
4	Channahalli	13° 10'10.3 77°45' 34.4	25		
5	Polanahalli	13°13' 30.3 77° 45' 57.8	10		
6	Naganayakanhalli	13°13' 48.9 77° 47' 45	33.34		
7	Channarayapatna	13°14' 37.7 77°47' 48.2	100		
8	Dinnur	13°15' 21.4 77°48' 70.7	34.29		
9	Gulya	13°24' 18.9 77° 42' 53.5	0	Doddaballapura	
10	Nandigundha	13° 20' 59.6 77°38' 55.6	6.25		
11	Kodihalli	13°18' 90.4 77°35' 33.3	5.65		
12	Malluru	13°19' 39.9 77°48' 56.6	0	Siddlaghatta	Chikkaballapur
13	Melur	13° 20' 59.0 77°49' 38.1	10		
14	Siddlaghatta	13°23' 11.4 77°52' 06.5	16.67		
15	Veerapura	13°33' 45.3 77° 54' 11.7	16.67		
16	Thinkal	13° 24' 05.9 77° 58' 18.9	0		
17	Chintamani	13° 24' 09.4 78 63 08.3	0	Chintamani	
18	Hosamadya	13°23' 08.7 77°50' 27.4	0	Chikkaballapur	
19	Jadala Thimmanahalli	13°26' 07.0 77° 43' 55.8	25		

**Figure 1: Global distribution of *Erinota* spp. (source: CABI, 2014)**

during the survey. Affected plantations had series of cylindrical leaf rolls along the leaf margin compared to unaffected plantations (Figure 2 and 3). Different developmental stages from egg to pupae were observed and larvae were collected to observe emergence of adults under laboratory conditions (Figure 4). Small, yellow eggs laid in clusters up to 10 on the under sides of banana leaves were observed (Figure 5). Caterpillars had cut and rolled the outer leaf-edges towards

the leaf midribs. Caterpillars with black heads, narrow necks and pale green bodies embedded in white, waxy powder were photographed after unrolling the leaf margins rolled by them (Figures 6 and 7). An infected larva was observed indicating the presence of an entomopathogen infection and needs further investigation (Figure 8). On attaining pupation, the opening of the leaf roll had a white hairy mesh. Pupae were long, slender, yellow-brown coated in a fine, white, waxy powder (Figures 9).

Recent surge in the infestation and lack of knowledge about the pest rendered seldom any suppression measures by the growers. Mechanical control by field scouting and periodic destruction of the rolled leaves by burning to kill the larvae is recommended. Known biocontrol agents include *Ooencyrtus erionotae* Ferriere (Encyrtidae), *Apanteles erionotae* Wilkinson (Braconidae), *Scenocharops* sp. (Ichneumonidae), *Anastatus* sp. (Eupelmidae), *Trichogramma* sp. (Trichogrammatidae), *Ecthromorpha fuscator* Fabricius (Ichneumonidae) and *Brachymeria obscurata* (Walker) (Chalcididae) (Ronald *et al.*, 1980). The Javanese banana-skipper is parasitized by 12 species of hymenopteran parasitoids (Erniwati, 2011). Hand picking of rolled banana leaves and destroying them by burning is considered the best management practice. If the population



Figure 2: uninfested banana Plantation



Figure 3: Infested plantation with leaf rolls in the leaf margin



Figure 4: Adult *Erionota torus* (wings lower side)



Figure 5: Eggs laid singly on banana leaf



Figure 6: Larva enclosed within cylindrical leaf roll



Figure 7: Larva exposed after unrolling the leaf roll



Figure 8: A infected larva



Figure 9: A pupal case

persists on large scale, application of Profenophos 50 EC @ 1.5 ml/l (RAMBIHARI Ahirwar *et al.*, 2016) Ekalax 25 EC (1.5 ml / l) or Dichlorovos 35 EC (2ml / l) or Spinosad 45 SC (Onkar Naik, 2014) is recommended for leaf feeding caterpillars.

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