

OUTBREAK OF SHORT HORNED GRASSHOPPER, *DIABOLOCATANTOPS PINGUIS* (STÅL, 1861) (ORTHOPTERA:ACRIDIDAE) IN YERCAUD COFFEE PLANTATION, TAMIL NADU

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Coffee production in India is dominated in the hill tracts of South Indian states, with the state of Karnataka accounting 53% followed by Kerala 28% and Tamil Nadu 11% of production. In Tamil Nadu coffee is grown in an area of 30,681 ha of which arabica occupies major portion (25,018 ha.) while remaining area is planted with robusta coffee (5663 ha.). The coffee areas in Tamil Nadu is divided into three agro-climatic zones viz., Lower Palani Hills, Shevaroy and Nilgiris. Lower palani Hills comprises of six liaison zones viz., Perumalmalai, Pannaikadu, Perumparai, Adalur, Sirumalai and Bodinayakanur. Liaison zones under Nilgiris are Coonoor, Gudalur and Anamalais (Valparai). Yercaud is the only liaison zone representing Shevaroy. Yercaud is located in the Shevaroy range of hills in the Eastern Ghats situated at an altitude of 1515 metres (4970 ft) above sea level, and the highest point in Yercaud is the Servarayan temple, at 5,326 feet (1,623 m). The temperature never rises above 29 °C (84 °F) or goes below 13 °C (55 °F). Coffee and citrus fruits, most notably oranges, are grown in abundance apart from bananas, pears and jackfruit. The total extent of Yercaud Taluk is 382.67 km², including reserve forest.

Coffee at Lower Palani Hills and in Yercaud is affected mainly by coffee green bug, *Coccus viridis* (Green), black citrus aphid, *Toxoptera aurantii* (Boyer de Fonscolombe), mealy bug, *Planococcus* sp. (Homoptera: Pseudococcidae) (Regupathy and Ayyasamy, 2013) and coffee berry borer *Hypothenemus hampei* Ferrari (Regupathy *et al.*, 2002) and are serious concern to the planters in Tamil Nadu.

Recently coffee in an area of 14 acres in Ettayiram solai, 5 acres each in Koilkadu and Teakadu in Cauverypeak of Yercaud was invaded by a brownish-yellow/ straw coloured short horned grasshopper (Figure 1). The grasshopper caused extensive damage by feeding leaves (Figure 2) even to the extent of complete defoliation in few plants (Figure 3). The berry formation and maturity were affected depending on the extent of defoliation. The grasshoppers were found feeding on shade plants and weeds as well. The grasshoppers rested on tree trunks of shade tree silver oak, *Grevillea robusta* are perfectly camouflaged and difficult to spot it unless when they jump off during disturbance by approaching human beings or during spray operations. The hoppers jumped off and moved to other areas when disturbed. The extent of population could be recognized from jumping hoppers by walking through the plantation.

A number of surface grasshoppers cause damage to rice, millets, cotton and coffee (Regupathy and Ayyasamy, 2013). The grasshoppers observed were one different from the pretty dark green spotted grasshopper, *Aularches miliaris* L normally found in coffee plantations in South India. *A. miliaris* had not been observed so far in a pest form causing economic damage (Ayyar, 1940; David and Ananthakrishnan, 2010). In contrast, within the Western Ghats Biodiversity Hotspot in south India, *A. miliaris* is sparse and listed as Near-Threatened (Josephraj Kumar, 2011). Hence the specimens collected from the plantation were sent to University of Agricultural sciences, Bangalore and Institute of Forest Genetics and Tree Breeding (IFGTB -ICFRE), Coimbatore for identification and confirmation.

The grasshopper was identified as *Diabolocatantops pinguis* (Stål, 1861) (Orthoptera:Acrididae). Occurrence of *D.pinguis* had been reported in Coimbatore, (Ayyar and Ayyar 1933; Abraham, 1959) and Chingleput district in Tamil Nadu (Vedham Karpakakunjaram et. al., 2002) and in The Gibbon Wildlife Sanctuary, Assam (Senthil kumar et.al., 2006) and in Veerangana Durgavati Wildlife Sanctuary, Madhya Pradesh, India (Kailash Chandra and Sunil Kumar Gupta 2009). *D.pinguis*(*Catantops pinguis*) had been reported to be a major pest on pastures (Nair, 1995) and feeding teak (Beeson 1941). *C.pinguis innotabilis* Walker feeds on maize, paddy, brinjal, bhendi, pea (Thakur and Thakur 2012), *Pinus longifolia* (Beeson, 1941; Mathur, and Singh 2006) ornamental *Gaillardia* plants in Lal-Baugh garden in Bangalore (Rai, 1982). Taxa belonging to the subfamily Catantopinae such as *Catantops pinguis innotabilis*, *Spathosternum prassiniferum*, *Eyprepocnemis alacris alacris* and *Tylotropidius varicornis* were found widely distributed in Dakshina kannada district, Karnataka (Seetharama Mayya, 2005). Other species of *Catantops* found causing major damage were *C.(annexus)pulchellus* on cotton, (Ayyar, 1940, Regupathy and Ayyasamy, 2013), *C. erubescens* Walk. on millets, by *Caloptenopsis* sp., *Catantops indicus* *C.humilis*, *C.innotabile* and *C.pinguis* on Teak, *C.indicus* on seedlings of *Pinus longifolia*, and *C.splendens* on stump-plants of teak (Beeson 1941).

The grasshoppers were observed in the month of October, 2011 and the population increased and caused severe damage to the extent of complete defoliation (Figure 3) in January- February, 2012. However the population and damage caused was more during 2011-12.

The grasshoppers were effectively managed by one time application of lambda cyhalothrin 5EC (REEVA 5% EC)@1.5ml/ litre of water. Application of chlorpyrifos (TAFABAN 20 %EC)@2ml/litre of water was also found effective. While spraying with high volume sprayer, the grasshoppers jumped and moved to other areas. Use of mist blower was found to be ideal to hit the flying/jumping hoppers. With regard to the period of distribution, it has been found that short-horned Acridid grasshopper belonging to subfamily Acridinae were abundant during January and February, and belonging to sub family Oedipodinae were abundant during February and March in Dakshina Kannada District (Seetharama Mayya, 2005), Karnataka. Catantopinae and Pyrgomorphae were present in large numbers during December and January. Among different species, *Spathosternum prassiniferum* was reported to be the most abundant followed by *Catantops pinguis innotabilis*, both from subfamily Catantopinae.

Apart from the attack by the regular pests, coffee plantation is occasionally invaded by insects from other hosts like star scale *Cerococcus* sp. (Asterlecaniidae) sheltered on tree trunk of common shade tree silver oak (*Grevillea robusta*) (Regupathy, 1978) and spittle bug, *Cosmocarta relata* D in 1978 (Regupathy, Unpublished). Cercopidae from jack tree in Lower Palani Hills due to elimination of their natural checks by various interventions and change in rainfall pattern. Pentatomid bugs invading coffee, pepper along with the shade tree silver oak in Heruru village near Madikeri was reported (TNN, 2011). Later this was identified as *Udanga montana* which breeds on bamboo when they flower and build up enormous numbers. Further field observations indicated that they did not feed on coffee or any other plants, however because of their weight the branches of shade trees might break (Personal communication from C.A. Viraktamath, University of Agricultural Sciences, Bangalore). Recently in September, 2013 outbreak of grasshoppers after the heavy rains of South West monsoon was reported in coffee plantations at Kolakeri near Napoklu, in Kodagu district of Karnataka State voraciously feeding on the shoots and leaves of the plants (Jeevan Chinappa, 2013).

Similar grasshoppers were reported in swarms in the region of Gonicoppa, Kaikeri, Srimangala and surrounding areas in Virajpet taluk a couple of years ago. They were long-horned insects which did not feed on any plant. The identity is to be established.

The outbreak of *D.catantops* during 2011-12 seems to be change in rainfall pattern. The fluctuations in climatic factors like rain fall, humidity, temperature, light and availability of hosts influence reproduction patterns, breeding behaviours and physiology of grasshoppers. It was informed by the planter that the

incidence occurred previous year (2010-11) also but at low level. The incidence of the grasshopper was again low during 2012-13. The rains received during 2011-12 were more when compared to that of previous two years and the subsequent year 2012-13. The fluctuations in the population of *D. catantops* were related to abiotic factors, such as maximum and minimum temperatures, rainfall and relative humidity (Vedham Karpakakunjaram et. al. 2002). Rainfall had a significant positive effect on the population immediately at Tambaram or with a lag (~ 1 month.) and relative humidity had a significant positive lag effect of about a month. Maximum temperature imposed a significant delayed negative effect on the population of this species that was prolonged 2-3 months. Minimum temperature had a significant negative lag effect of about 2 months.

The present outbreak of *D. pinguis* seems to be occasional. However there is a need to monitor this grasshopper population from the month of October. The integrated grasshopper management is to prevent the buildup of populations to damaging levels. During localized outbreaks, mechanical collection of nymphs and adults, and destruction of egg pods, might be useful in checking this grasshopper from causing damage. However, some periodic outbreaks will inevitably occur, and some will require immediate intervention in the form of fast-acting chemical lambda cyhalothrin and chlorpyrifos. While spraying with high volume sprayer, the grasshoppers jumped and moved to other areas. Hence use of mist blower is suggested to hit the flying/jumping insects.

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Figure 1. Grasshopper , *Diabolocatantops pinguis*.



Figure 2- Feeding holes by grasshopper on coffee.



Figure 3. Defoliation of coffee by grasshopper