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POPULATION DYNAMICS OF THE LANTANA BUG, *TELEONEMIA SCRUPULOSA* STAL (TINGIDAE)

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Seasonal occurrence of an exotic tingid *Teleonemia scrupulosa* Stal on an exotic weed *Lantana camara* has been studied. The population fluctuations of the life stages could be directly correlated with high temperature, high humidity and low rainfall.

INTRODUCTION

Studies on the seasonal occurrence and the population estimation of tingids are available for a few species *viz. Urentius echinus* Dist. (Patel & Kulkarney, 1955; Yadav, 1977). *Tingis ampliata* H.S. (Southwood & Scudder, 1956), *Habrochila leata* Drake (Mohanasundaram & Basheer, 1968; Asari, 1972), *Stephanitis typicus* Dist. (Mathen, 1968), *Tingis buddleiae* Drake (Livingstone, 1969) and *T cardui* L. (Eguagie, 1974). The incidence of population of 11 species of Tingidae belonging to 10 genera have been worked out by Livingstone (1961) in Agra. Studies on the population fluctuations of the imported lantana bug, *Teleonemia scrupulosa* Stal carried out by Khan (1945) in Dehra Dun, Varma & Sadatullah (1973) in Hyderabad and Harley *et al.* (1979) in Australia have shown that there is significant variation in the population pattern of this bug under different seasonal, biogeographical and bioecological conditions. The present paper deals with the population dynamics of the life stages of *Teleonemia scrupulosa* Stal, in relation to the microclimatic conditions of the scrub jungle ecosystem of the Palghat-Gap, where the agroecosystem is invariably bordered by the scrub jungles in which *Lantana camara* is a constituent flora.

MATERIAL AND METHODS

The population pattern of the nymphs and adults of *T. scrupulosa* were studied from August 1978 to September, 1980 in the scrub jungles of the Maruthamalai hills of the Palghat-Gap (altitude 435 - 1150 m AMSL; latitude 11.2°N; longitude 77.03°E; atmospheric pressure 949 to 930 mm; annual rainfall below 560 mm; maximum temp 29°C in December and 36°C in April). Six observation sites, each having 20 – 30 plants of varying age and size, were selected at random in a 5 sq. km. study area. The insect population was estimated by counting the adults and nymphs from 10 heavily infested leaves from each site. Samples thus collected were pooled and figured after calculating the average for each month (Fig. 1). The meteorological data were recorded from the Tamil Nadu Agricultural University's Meteorological Station. Field meteorological readings were recorded at the Field during each collection, approximately at 15 hrs. The rainfall data two days prior to the day of observation was taken into consideration in order to assess more accurately the influence of rainfall on the population density of this bug. Since the duration of the stadial period of this bug has been 10 - 13 days (Livingstone *et al.*, 1981), regular collections were made once in every 15 days. The first two instars are too tiny to recognize in the field hence counted together.

RESULTS AND DISCUSSION

The population of *T. scrupulosa* in the first two instars has registered a significantly high peak in May, 1979. It is significantly nil in both the years during April. Gradual decline in the population level of these early stages during June & July, lead to a decline to nil during August & September in 1979, is also significant. It is also evident that though there is a marked decline in the population coupled with high humidity and low to nil rainfall during these months; humidity and rainfall together hence apparently have no influe-

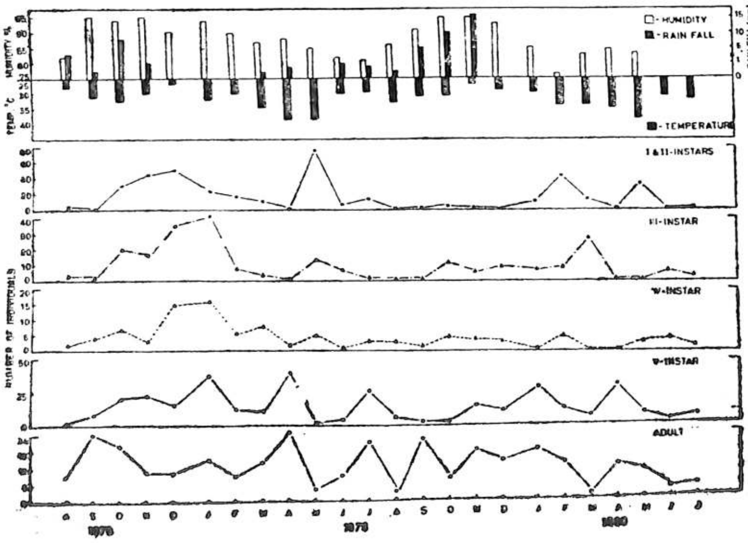

Fig. 1. Population dynamics of *Teleonemia scrupulosa* Stal in Maruthamalai scrub jungle, Palghat-Gap.

nce on the population level of the first two instars. On the other hand, the high peak reached during the month of May in both the years appears to be directly correlated to the prevailing high temperature, high humidity and low rainfall, recorded in the preceding month as well. The climatic parameters during May, therefore, seem to be directly related to the hatching potential of the eggs deposited in the latter half of the preceding month. The incubation period at this time has been 5.2 ± 0.02 days (Livingstone *et al.*, 1981). The month of April with optimum weather conditions, has no record of the first two instars; while the month that follows, records a sudden rise (reaching the peak population) of these two instars. The month of January records relatively low population of such instars because the preceding month (November) had no hatching due to low temperature, high humidity and heavy rainfall.

It is significant to note that in April of both the years, when the first three instars were almost absent with heavy population of the fifth instar and moderate of the adults, massive migration of the last instars to new feeding sites where they emerge into adults, might be one of the reasons for build up in the population of the first two instars in the following month. The same concept is applicable for the build up in the population of the first two instars in the month following February too. Judging from the ineidence of the first two instars in the two years, it appears that under field conditions 9 to 10 generations per annum (under laboratory conditions) are available and that the heavy build up of population depends on the reigning weather conditions *i.e.* temperature (36°C) and humidity (88%), and low rainfall, most conducive for maximum hatching.

A survey of the population pattern also reveals that when the population of one particular stage is low, the population of the stage succeeding it is high and vice versa. However, this difference is not in definite proportions. It is also observed that on each month one particular stage dominates. The frequency and intensity of this dominance is erratic as it appears to be governed by existing weather conditions. Since migration favoured by winds occurs as the adults emerge, the adult population is found to be always low at a time when the population of the fifth instar reaches high.

In the Palghat-Gap, low temperature and high humidity and heavy rainfall adversely affect the population of the first two nymphal instars and high temperature, high humidity and moderate rainfall favour their population growth. The population of the fifth instar and of the adults, however, does not indicate any drastic change under all prevailing weather conditions. The population pattern of *T. scrupulosa*, thus is inconormity to Khan (1945), whereas Varma & Sadatullah (1973) observed that high temperature and low humidity adversely affect the population and moderate temperature and humidity favour population growth. Therefore, it is convincing that this bug could remain permanently established in the scrub jungles of Palghat-Gap.

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