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**EFFECTS OF ENVIRONMENTAL FACTORS ON POPULATION
FLUCTUATION OF MANGO HOPPER (*Idioscopus clypealis* Leth.) IN SOUTH
EAST OF IRAN**

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ABSTRACT

Mango hopper is one of the most serious pests during mango flowering season in south east of Iran. The population fluctuations of the insect were studied by weekly sampling using sweeping net on mango trees in two regions viz. Minab and Siahoo from middle of Aug. 1995 to Aug. 1996. In Minab the metrological data was derived from metrological station and in Siahoo by installation of a thermo-hydrograph. The maximum and minimum population densities were recorded in April-May and January-February in Siahoo and March-April and December-January in Minab respectively. In both regions, the effects of average temperature and relative humidity percent on pest population density was significant at 5 percent probability level; Although the effects of average temperature was more important. The relation between increasing population density and relative humidity was negative.

Key words: *Mangifera indica*, metrological data, flowering season, Hormozgan, Iran.

INTRODUCTION

The cicadellid, *Idioscopus clypealis*, Leth. is the most destructive pest of mango (*Mangifera indica* Linn) in India and abroad (Baker, 1915; Kato, 1928; Ghauri, 1967; Tandon and Lal, 1976; Went and Lee, 1978). The nymphs and adults suck the sap of tender leaves and inflorescence, which falls off. Mango hopper was reported in 1983 of Sistan and Bleuchistan of Iran and now is one of the important pests of mango in Iran. The biology and its natural enemies were studied during 1996-1997 in Hormozgan province of Iran. It has one generation per year during flowering season and over wintering was observed as adult mainly on mango trees (Pezhman, 1997). Knowledge of insect population fluctuations on its host in relation to physical environmental factors is quite useful for predicting pest population and ultimately in pest management. Hopper population was at peak in Lucknow, India, during March-April, while lowest during December-January. Temperature and percentage relative humidity together have much influences on hopper population development (Tandon et al., 1983).

MATERIALS AND METHODS

The studies were conducted in two mango orchards in Minab and Siahoo regions in Hormozgan province during 1996-1997. To determine the adult pest populations, three sweeping nets on a selected tree in each region were done with weekly interval; also the numbers of

nymphs on five inflorescences were weekly counted in flowering season. Metrological data in Minab was obtained from climatological station and in Siahoo by installation of a thermo-hydrograph system. The monthly metrological data including rainfall, average temperature, average relative humidity percent, and monthly average pest population, were calculated, and then statistically analyzed. The relations between pest population fluctuations and the metrological factors were determined by multiple linear regressions.

RESULTS AND DISCUSSION

In Minab region maximum and minimum population densities were observed during March-April and January respectively, while in Siahoo it was April-May and February respectively (Fig. 1 and Fig. 2).

The maximum population density took place during flowering season. Wen and Lee (1978) and Tandon, et al. (1983) reported similar observation in case of *I. nivesparsus* and *I. clypealis*, respectively.

Since Siahoo is cooler than Minab, there is 20-25 days difference between starting flowering season and pest activity between these two regions. Therefore, maximum pest population in Siahoo observed 20-25 days after Minab region.

In Minab region, maximum adult population was observed in the early April, while in Siahoo it was at the end of April.

In both regions, the effects of average temperature and relative humidity percent on pest population density was significant at 5 percent probability level although the effects of average temperature was more important.

In both regions the relation between pest population density and relative humidity was negative but the relation between pest population and average temperature was positive. Tandon et al. (1983) reported that the percentage of relative humidity and temperature had significant effects on hopper population.

Finally, the following equations were obtained based on regression analysis of effects of climatological factors on pest population density *Idioscopus clypealis* for both regions, which can use to predict the pest population fluctuations by metrological factors.

Equation 1 (for Siahoo region)

$$Y = -40.5 - 1.29X_1 + 9.7X_2$$

Y= Average pest population per month

X₁= Average relative humidity percent per month

X₂= Average temperature per month

Equation 2 (for Minab region)

$$Y = 25.9 + 753 X_1 - 2.326 X_2 + 5.56 X_3$$

Y = Average pest population per month

X₁= Rainfall per month

X₂= Average relative humidity percent per month

X₃= Average temperature per month

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FIGURES

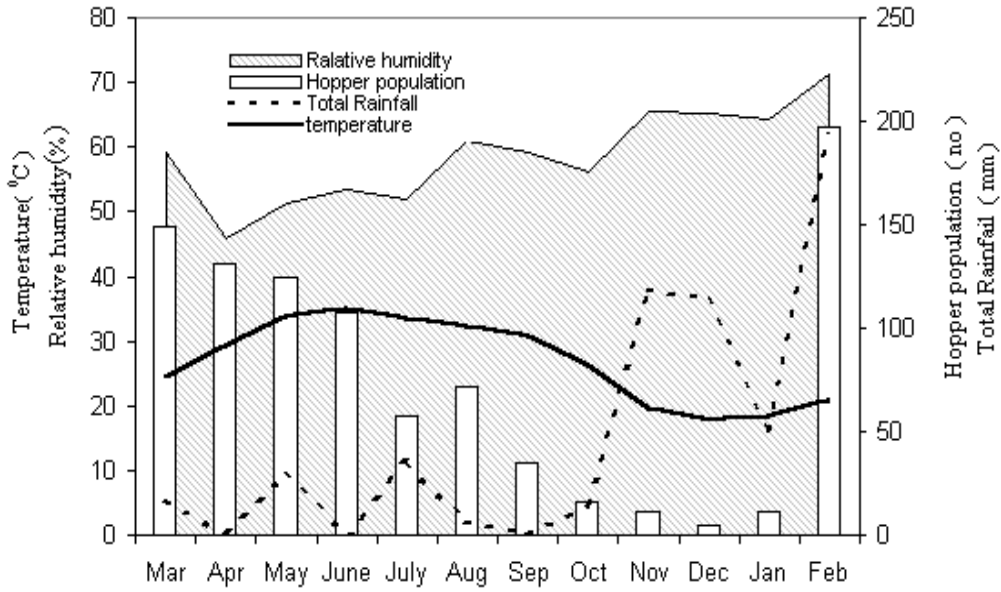


Figure 1: Effect of climatological factors on population density of *Idioscopus clypealis* in Minab region

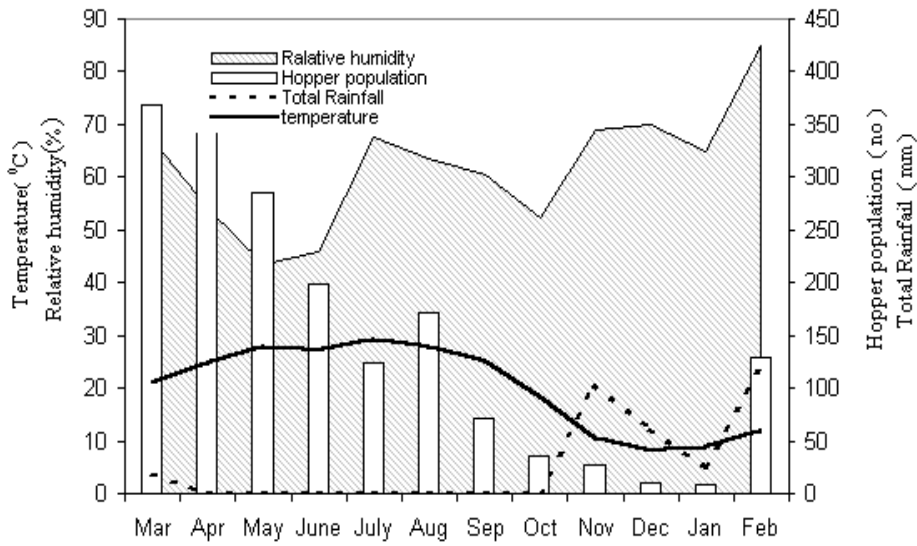


Figure 2: Effect of climatological factors on population density of *Idioscopus clypealis* in Siahoo region