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POPULATION DYNAMICS OF PEAR PSYLLA *CACOPSYLLA PYRICOLA* FOERSTER

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ABSTRACT

Population buildup of pear psylla (*Cacopsylla pyricola)* Foerster on pear was studied under temperate conditions of Kashmir valley during 2014-2015. The population was correlated with maximum and minimum temperature (°C), morning and evening relative humidity (%), and rainfall (mm). The results revealed that the population of nymphs and adults was observed till harvest (1st week of September) with three peaks during June and July (23rd, 27th and 29th standard week). The maximum population was observed during June i.e. 12.57/ 12 shoots.

Key words: *Cacopsylla pyricola,* population buildup, Kashmir, Chariesharief, Krimshore and Chadoora, temperate, temperature, relative humidity, rainfall, correlation coefficients

Pear (*Pyrus communis*) is commercially the second most important world's deciduous fruit tree following apple, with a productivity of 4.6 t/ha (Ravindran et al., 2007). Pear psylla (*Cacopsylla pyricola* Foerster) is one of the most important insect pests of pears, and cause damage to both fruits and trees. At high densities, pear psylla (*C. pyricola*) causes tree stunting, premature leaf drop, reduced fruit size and premature fruit drop resulting in heavy losses in yield (Burts, 1970; Westigard and Zwick, 1972). Adults acts as a vector of the mycoplasma like organism (Hibino and Schneider, 1970) that is responsible for pear decline disease (Lindner et al., 1961; Jensen et al., 1964; Carraro et al., 1998). The pear psylla is an emerging pest of pear in Kashmir and this study explores the effect of weather factors on its population dynamics.

MATERIALS AND METHODS

The study was carried out at three locations viz. Chariesharief, Krimshore and Chadoora in district Budgam during 2014-2015. Ten trees of same age and vigour were selected randomly from each orchard. The canopy of the selected trees was divided approximately into three strata (upper, middle and lower) and from each stratum four terminal shoots (one from each quadrant) accounting for 12 shoots/ tree were examined for incidence of nymphs and adults, of which counts were made at weekly intervals. The observations were made for 17 weeks from the appearance of nymphal population till harvest. The data obtained were correlated with temperature (maximum and minimum), relative humidity (morning and evening), and rainfall, and correlation coefficients worked out.

RESULTS AND DISCUSSION

The population of *C. pyricola* was observed to vary at the three locations, with nymphal population first appearing in May with population present throughout the year. During winter only overwintering adults were found surviving (Fig. 1). The population of nymphs and adults was observed till harvest (1st week of September) with three peaks during June and July (23rd, 27th and 29th standard week). The maximum population was observed during June i.e. 12.57/ 12 shoots (23rd standard week-pooled data). The maximum population observed during July coincided with maximum, minimum temperature (°C), morning, evening humidity (%), and rainfall (mm) of 8.00-31, 12.44-15, 72.57-82.71, 42.57-46.00 and 0.10-8.11, respectively. Viraktamath and Bhumannavar

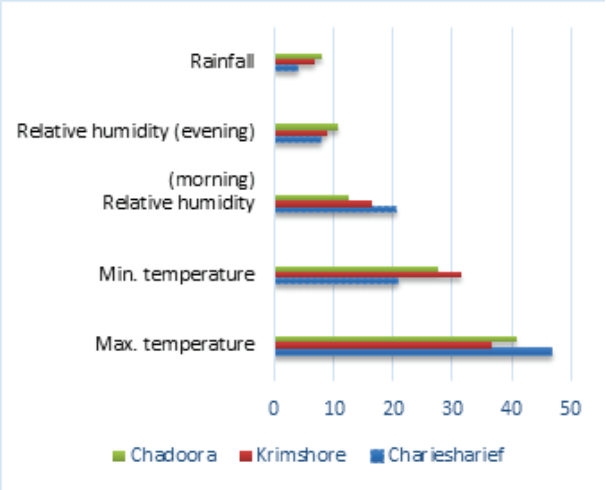

Fig. 1. Population dynamics of *C.pyricola* vs. weather factors

(2002) observed that the population of citrus psylla, *Diaphorina citri* was found usually high during July-August, as well by Sharma (2008). Mercado et al. (1991) reported that psyllid population was quite high till the end of August.

The population dynamics at various locations given in Table 1 reveal that the population at Chariesharief, with maximum and minimum temperature, there existed a positive correlation (0.512 and 0.489, respectively; relative humidity (morning and evening) and rainfall had a negative correlation (0.441 and 0.313 and 0.201, respectively). Such positive correlation with temperature was observed at Krimshore too; also, there existed a negative correlation with relative humidity and rainfall. Similar was the case with the population at Chadoora. Thus, temperature has been found to be the governing factor. Fig.2. shows that maximum temperature was the major factor in the population fluctuation of *C. pyricola,* followed by minimum temperature, relative humidity at morning and, rainfall.

These kind of observations were obtained for citrus psylla (*Diaphorina citri*) as confirmed by the findings of Lakra et al. (1983), Khan et al. (1984) and Nehru et al.

Table 1. Correlation coefficients -population of *C.pyricola* vs. weather factors (2014-2015)

	Charisaha-reef	Krimshore	Cha-doora
Max. Temp. (^{O}C)	0.512*	0.493*	0.510*
Min. Temp. (^{O}C)	0.489*	0.486*	0.491*
Rel. Humidity morning (%)	-0.441	- 0.412	-0.401
evening (%)	-0.313	- 0.339	-0.398
Rainfall (mm)	-0.201	-0.304	-0.379

*Significant at p= 0.05

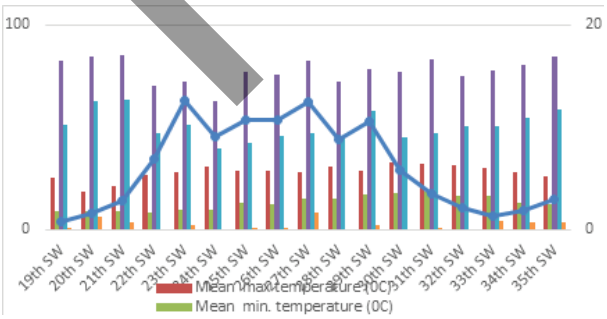

Fig 2. Contribution of weather factors vs population of *C. pyricola*

(2006). Rao and Pathak (2001) also recorded maximum number of adults of *D. citri* in June in Meghalaya and found a positive correlation with minimum temperature. Sharma (2008) reported that minimum, maximum and mean temperatures, relative humidity had a positive relation with both nymphal and adult population of *D.citri.* Ahmed et al. (2014) also obtained significant positive correlations between psyllid damage and temperature in case of leucana psyllid (*Heteropsylla cubana*).

Soufo et al. (2015) reported that the increase of relative humidity and rainfall led to a decline in population of eucalyptus psyllid, *Blastopsylla occidentalis*. However, Virender et al. (2007) in their studies on olive psylla (*Euphyllura pakistanica*) obtained positive correlation of psyllid population with temperature but negative nonsignificant correlation with relative humidity. They also reported weak positive correlation of rainfall with psyllid population. Burts (1970) observed that temperatures above 90^{0} F cause reduction in oviposition and temperatures above 100^{0} F cause mortality in the nymphs. Brunner (1984) concluded the optimum temperature for development was 26°C and high temperature coupled with low humidity resulted in low population levels.

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