

STUDIES ON THE RELATIONSHIP BETWEEN THE DENSITY OF LAC
INSECT, *KERRIA LACCA* (KERR.) (HOMOPTERA : COCCIDAE) AND
CHALCID PARASITISATION

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While studying the extent of damage caused by predators of lac insects during *jethwi* and *aghani* seasons from the lac encrusted twigs of *kusum* (*Schleichera oleosa*) which were collected from the experimental area at Maheshpur-Sirka, it was observed that the density of population of lac insects influenced the degree of parasitisation by the chalcid parasites associated with lac. Although studies were conducted on certain aspects of parasitisation and damage to lac crops, the earlier workers (Misra, 1929; Glover, 1934; Negi *et al.* 1945) did not indicate any relation between the density of the lac insects and the degree of parasitisation by the chalcids concerned. Recently, Majumdar, Bhattacharya and Chatterjee (1962) have indicated a significant linear relationship between the populations of the major chalcid parasites associated with the lac insects. The five parasites of major importance considered in this context were *Tetrastichus purpureus* Cam. (Eulophidae), *Eupelmus tachardiae* How. (Eupelmidae), *Erencyrtus dewitzi* Mahd. (Encyrtidae), *Tachardiaephagus tachardiae* How. (Encyrtidae) and *Coccophagus tschirchii* Mahd. (Eulophidae). According to them, the relationship in the populations between the parasites was positive, but no studies were made on the basis of the density of the lac insects. Hence, it was considered desirable to determine the nature of relationship, if any, between the density of population of lac insects with the degrees of parasitisation due to the chalcid parasites in the developing lac crops in different seasons.

MATERIAL AND METHOD

Samples of lac insects settled on the twigs were collected at two stages of development namely, (a) at the time of male emergence, and (b) at about the crop maturity time, from the lac crops raised during *jethwi* and *aghani* seasons. In each crop season, 120 such samples, each of 7.5 cm length were collected and examined microscopically for recording the lac cells damaged by the chalcids. The overall percentage of parasitisation due to all the chalcids named above was calculated on the total population of lac insects, and the data obtained were statistically analysed.

RESULTS AND DISCUSSION

The data from the 120 sets of observations from each of the two crops were classified into different groups according to the density of lac insects obtained at the two stages of development for analysis. The data obtained are depicted in Fig. 1. From the data it was observed that the average percentage of parasitisation, during the years under review, varied from 1.15 to 3.21 and 1.71 to 3.59 at the first and second stages of development, respectively, during *jethwi* season. Similarly, the figures for the same stage were 1.03 to 5.05 and 2.35 to 9.20, respectively, during the *aghani* season. It was also evident from the data of the two different stages that the incidence of parasites was more towards the later stage of development, *i.e.*, during the second stage of collection in between the male emergence and crop maturity. The variation in percentage of parasitisation at the two stages might be due to two factors. Firstly, all the five chalcids, responsible for damage, do not occur simultaneously in the earlier stages of lac insect development. Secondly, even if these parasites were

active, the stage of lac insect was not acceptable to all of them, chances being that these parasites were passed on to the developing *rangeeni* crop.

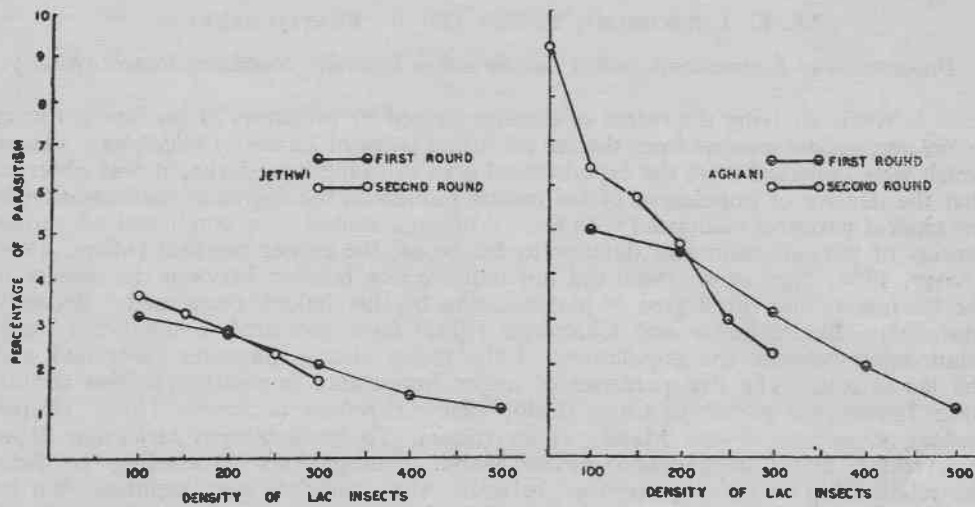


Fig. 1. Relation of density of lac insects and parasitisation by chalcids in different crop seasons.

Further, it is also seen from Fig. 2 that the average total percentage of parasitism for the three crops varied from 3.60 to 4.25 during *jethwi* and 6.96 to 13.72 during the *aghani* seasons, where the parasitisation was much heavier during *aghani* crop and thus corroborate the earlier findings (Majumdar *et al.* 1962) made in a different locality.

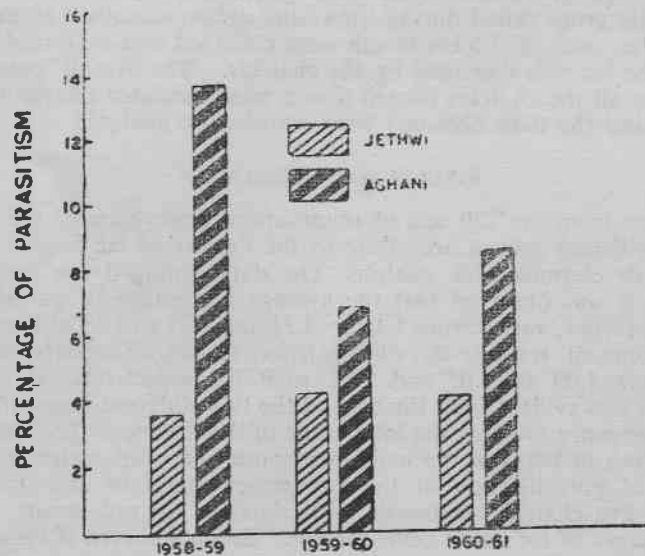


Fig. 2. Comparison of percentage of parasitisation between two lac crops.

It was obvious from a comparison of the two groups that the percentage of parasitisation is influenced by the density of lac insects. The data were statistically analysed to find out the correlation between the density of lac insect population and the degree of parasitisation. The results of analysis are given in Table 1.

Table 1. Correlation—Coefficient (r) between density of lac insect population and percentage of parasitisation

Crop & year	Ist stage of collection (r)	IInd stage of collection (r)
<i>Aghani</i> 1958-59	-0.96	-0.96
<i>Aghani</i> 1959-60	-0.97	-0.97
<i>Aghani</i> 1960-1961	-1.00	-0.98
<i>Jethwi</i> 1958	-0.97	-1.00
<i>Jethwi</i> 1959	-1.00	-0.98
<i>Jethwi</i> 1960	-0.73	-0.84

The above analysis shows a significant relationship between the variables for all the crops in both *jethwi* and *aghani* seasons. All relationships under the first and second stage of collections are negative, *i.e.*, an increase in the population of lac insects is followed by a decrease in the parasitisation.

SUMMARY

The *jethwi* crop is less affected by the chalcids than the *aghani* crop.

The degree of parasitisation is reduced with the increase in the density of lac insect population.

The incidence of chalcid parasites is more towards crop maturity.

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