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## SEX IN RELATION TO THE SEQUENCE OF LARVAL EMERGENCE IN LAC INSECTS

Negi, Misra and Gupta (1931) studied sex ratio in every 24 hour emergence of lac insect larvae from individual mother cells and reported that the emergence is of mixed character and that no interrelation exists between the sequence of emergence and sex ratio in them. Their data, as presented, however, do not seem to support such a conclusion since comparison between different batches of emergence within individual progenies is not possible from their data. Moreover, their experiments were conducted under the field condition with no provision for any protection against losses due to inimical insects which are particularly heavy in smaller colonies. Thus, if the sexes are differentially affected by these agencies, sex ratio at the time of pre-pupal and pupal stages of the male, when the sexes were scored, would be different from that when the young emerged from their mothers. The present note reports results based on controlled experiments designed to study the proportion of sexes in the different batches of larval emergence within individual progenies.

The mature females of *rangeeni* strain of the lac insect *Kerria lacca* (Kerr) were collected at random from the field both from the dry and rainy season generations about a week before the time they were due to produce their progeny. The young emerging from each mother every 24 hours were reared separately on potted plants of *Moghania macrophylla* under cover of a 80 mesh wire-net sleeve to check losses due to inimical insects. The progeny of each mother was then grouped into three batches, early, middle and late, according to the sequence of their emergence. Since the sex is indistinguishable in the early stages, the sexes were scored when the males had reached the pre-pupal stage.

The data presented in Table 1 show that the proportion of males is highest in the earliest batch and then declines rather sharply and progressively in the subsequent batches, reducing to half and one third in the final batch of emergence in the rainy and dry season generations respectively. Differences of this order cannot be expected from chance variation. Chi square values were calculated to test the significance of differences in the proportion of males between batches. These values were 63.20 and 47.65 for two degrees of freedom in the dry and rainy season generations respectively and are highly significant in both generations, indicating a definite relation between the sequence of emergence of the young and sex ratio in them. However, these results are contrary to the earlier contention. The overall proportion of males agree well with the various estimates made on the natural aggregates of these insects.

Table 1  
Proportion of males in the early, middle and late batches of larval emergence from ten mother cells

Season	Batch	Number examined	% males
Dry	Early	369	57.4±2.6
	Middle	344	41.3±2.7
	Late	267	21.4±2.5
	Average		41.9±1.5
Rainy	Early	686	35.5±1.8
	Middle	499	28.7±2.0
	Late	695	18.8±1.5
	Average		27.5±1.1

Though the genetic basis of sex determination remains obscure in lac insects, a greater environmental role is indicated from various observations on their natural aggregates. Thus, the proportion of males is shown to differ with the season (Glover, 1937), the level of crowding (Krishnaswami, Purkayastha and Majumdar, 1963; Purkayastha and Krishnan, 1964) and even with the site of colonisation on the same plant (N. S. Chauhan, unpublished data), suggesting nutritional influence. The present study brings to light yet another source of variability, the nature of which remains to be established.

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