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STUDY OF SEX RATIO IN THE NATURAL POPULATION OF *PHEROPSOPHUS HILARIS*, FABR. (CARABIDAE : COLEOPTERA)

IN an earlier report (Kalyanam and Shanmugham, 1971) sex dimorphism in the bombardier beetle *Pheropsophus hilaris*, Fabr. was described. *P. hilaris* is widely distributed in South India and it is an economically useful insect for, it is a predator on many insect pests of agricultural crops (Andrews, 1929). The present work was undertaken to study the male-female ratio in a natural population of this beetle during the course of one year.

Random samples of the beetles were collected from the natural population in a particular area, Madras-30, for one year. The sampling period extended from January to December, 1971. Samples were collected at intervals of ten days, *i.e.*, on the 10th, 20th and 30th of every month. In February the month-end sample was collected on the 28th. Each sample consisted of 20 to 30 beetles. The samples were anaesthetized with ether and the sexes were identified as described earlier (Kalyanam and Shanmugham, 1971). After counting the males and females in the sample, the beetles were allowed to recover and then released at the site of collection.

The number of specimens collected and the percentage of males and females in each quarter of the year are given in Table I. The data were statistically analysed using proportion test to see whether the differences between male and female populations are significant at 5% level for the whole year and for different seasons of the year. The results are added to Table I.

The analysis of the data indicates that the males are significantly more numerous than the females throughout the year in a natural population of *P. hilaris*. The males are significantly greater in number during the periods of January to March and July to September (Fig. 1). During the other two quarters, *i.e.*, April to June and October to December the differences between sexes are not significant. The two quarters (January–March and July–September) mark the pre- and post-monsoon periods in this region.

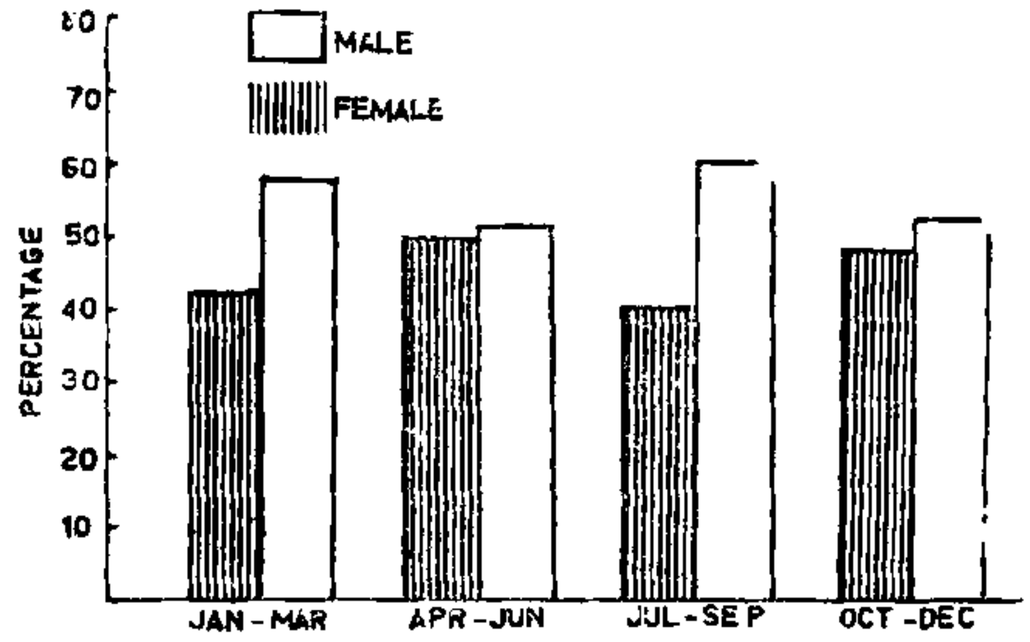

FIG. 1. Seasonal fluctuations in the proportions of males and females of *P. hilaris*, during 1971.

The reason for the relative reduction of the females during pre- and post-monsoon periods is not known. Further investigation is in progress.

TABLE I

Percentage composition of males and females of P. hilaris *in different quarters of 1971. Summary of the statistical analysis is also given*

Period	Total No. of specimens	% of females	% of males	Proportion	Standard error	Variable	Remarks
January–March ..	271	42·44	57·56	0·5756	0·0303	2·50	Significant
April–June ..	274	49·64	50·36	0·5036	0·0302	0·12	Not significant
July–September ..	279	40·14	59·86	0·5986	0·0299	3·30	Significant
October–December .	251	47·81	52·19	0·5219	0·0220	1·00	Not significant
January–December ..	1075	44·93	55·07	0·5507	0·0192	2·64	Significant

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BASE COMPOSITION OF *ASPERGILLUS NIGER* AND ITS MUTANTS

FEW attempts have been made on the determination of the base composition of DNA and RNA of some Fungi and Myxomycetes[1-3]. Here investigation has been made to establish the base composition of *Aspergillus niger* (V_{35})[4] and some of its mutants. DNA samples were obtained from the germinating conidia as reported earlier[5]. From the wild type V_{35}, the mutants 31 av, 51 sg, 45 bl arg$^-$, 21 av leu$^-$, 21 sg ad$^-$ were derived through UV-treatment[4] and the actidione resistant mutant, 68-acr was obained by NTG-treatment[6].

Method of chromatography is based mainly on Bendich[7] and Chargaff and Davidson[8]. 1 mg of DNA was applied to Whatman No. 1 filter-paper and developed for 17 hours in isopropanol : conc. HCl : water (68 : 15·5 : 16·5) solvent system. The concentration of different bases were determined by differential extinction technique[8]. The unknown spots were located on the paper by comparing with those obtained from standard bases. Mole per cent of unknown samples was calculated on the basis of that recovered from known ones. Table I shows the base composition of DNA of V_{35} and its mutants. Base composition of dormant and germinating conidia of *Aspergillus oryzae*[3] are also included for comparison.

Base ratio of V_{35} and its mutants varied from 1·04–1·20. With dormant and germinating conidia of *A. oryzae* the ratios are 1·21 and 1·11 respectively[3]. The base ratio of calf thymus DNA is 1·37. Watson[9] reported the base ratio of another strain of *A. niger* to be 1·0 which is not very far from V_{35}.

TABLE I

Base composition of A. niger *and its mutants*

Strain	Adenine	Guanine	Cytosine	Thymine	$\frac{A+T}{C+G}$
V_{35}	25·6	22·4	25·2	26·3	1·09
31 av	25·6	22·1	25·6	26·6	1·09
51 sg	25·5	22·4	25·9	24·9	1·06
45 bl arg$^-$	25·4	24·0	25·0	24·7	1·20
21 av leu$^-$	25·6	22·5	25·6	25·5	1·1
21 sg ad$^-$	25·6	22·6	25·5	25·5	1·1
68 acr	25·7	24·0	25·0	24·7	1·04
*A. oryzae** germinating conidia	27·2	22·0	25·5	25·4	1·11
*A. oryzae** dormant conidia	28·2	20·5	24·7	26·5	1·21
Calf thymus*	29·9	21·0	21·2	27·9	1·37

The results given above are average of three readings.
* From Kogane and Yanagita (1964).

DNA of V_{35} and its mutants belong to 'AT' type. So also is the case of dormant and germinating conidia of *A. oryzae* where 'AT' predominates. Watson's[9] observation on another strain of *A. niger* showed that the DNA is of intermediate type.

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