

## SEX RATIO IN NORMAL AND SEX-LIMITED STRAINS OF SILKWORM, *BOMBYX MORI*

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STUDIES on sex ratio and its distortion have been carried out in several insects<sup>1,2</sup>. Sex separation in silkworm commercial cross-breeding, at cocoon stage is labour-consuming and often erroneous<sup>3</sup>. Translocation of markers responsible for particular character to W. chromosome (femineity determining chromosome) in silkworm resulted in silkworm strains which possess female larvae with markings<sup>4</sup>, female cocoons of golden yellow colour<sup>5</sup> and black eggs which give rise to only females<sup>6</sup>. In these strains females could be separated at larval, cocoon and egg stages to utilize for hybridization. In India, sex-limited polyvoltine strain with markings on female larvae has been isolated<sup>3</sup>. However, the general contention is that the females of the sex-limited strain are less viable as compared to the normal strains. Hence, the present study was under-

taken to determine the sex-ratio in normal and sex-limited polyvoltine strains.

Normal polyvoltine silkworm race, 'Pure Mysore', indigenous to Karnataka and a polyvoltine sex-limited strain, Pure Mysore (sex-limited) bred at this Institute, which carries markings only on females, were used for the study. Eggs laid by a single moth in 24 h period were allowed to hatch and all the larvae derived from one laying were considered as one brood. Three such broods were raised in each strain.

Sex could be discriminated in sex-limited strain at third instar by virtue of larval markings on female. However, in normal strain no such discrimination was possible. Hence, all the larvae of each brood in each of the strain were retained and reared up to cocoon stage during June-July, August-September, October-November and December-January, 1986-87. Cocoons of each brood were cut open and the sex of the pupae was recorded in both the strains. The broodwise sex ratio was recorded and subjected to  $\chi^2$  homogeneity test to ascertain the significant levels of female:male ratio.

Results showed that sex-ratio in silkworm is close to 50♀:50♂ at egg and early larval stages. How-

Table 1 Sex-ratio in normal and sex-limited strains of silkworm

Crop	Sex-limited				Normal		
	Brood	Males	Females	Probabilities	Males	Females	Probabilities
June-July 1986	1	37	27	0.30 > P > 0.20	26	23	0.70 > P > 0.50
	2	37	33	0.70 > P > 0.50	41	35	0.50 > P > 0.30
	3	30	26	0.70 > P > 0.50	37	33	0.70 > P > 0.50
	Total	104	96	0.20 > P > 0.10	104	91	0.50 > P > 0.30
August-September 1986	1	43	43	1.00 > P > 0.99	40	37	0.80 > P > 0.70
	2	36	40	0.50 > P > 0.30	43	31	0.20 > P > 0.10
	3	40	38	0.95 > P > 0.90	49	40	0.95 > P > 0.90
	Total	119	121	0.90 > P > 0.80	132	108	0.20 > P > 0.10
October-November 1986	1	26	21	0.50 > P > 0.30	35	34	0.95 > P > 0.90
	2	34	30	0.70 > P > 0.50	43	34	0.50 > P > 0.30
	3	40	32	0.50 > P > 0.30	38	35	0.80 > P > 0.70
	Total	100	83	0.30 > P > 0.20	116	103	0.50 > P > 0.30
December-January 1986-87	1	27	30	0.70 > P > 0.50	25	23	0.80 > P > 0.70
	2	34	32	0.90 > P > 0.80	24	24	1.00 > P > 0.99
	3	40	36	0.70 > P > 0.50	22	18	0.70 > P > 0.50
	Total	101	98	0.95 > P > 0.90	71	65	0.70 > P > 0.50

ever, at the cocoon stage, the number of males generally outnumber the females<sup>7</sup>. In the present study, an excess of males both in normal and sex-limited strains (table 1) was found. The probability values are insignificant indicating that the female:male ratio is close to the theoretical sex ratio of 50♀:50♂ in both normal and sex-limited strains. Studies conducted on several Lepidopteran insects have shown a larger number of males<sup>8</sup>. The decreased viability of females, especially in poor ecological conditions which are common, may be due to heterogamety of the female sex for the sex chromosomes (ZW). This results in lethal and semilethal genes of the Z chromosome being in a hemizygous state in the female in contrast to the males. The present study based on sex-ratio has shown no significant difference between the viability of normal females and sex-limited females and that the females are in general less viable compared to males.

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## ANNOUNCEMENT

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### NATIONAL SYMPOSIUM ON

### CURRENT TRENDS IN PHYSICAL ORGANIC CHEMISTRY

The above symposium, a three-day National Symposium entitled 'Current Trends in Physical Organic Chemistry' will be held during February 27-March 1, 1989 at the Department of Materials Science, Madurai Kamaraj University, Madurai.

The objective of the symposium is to acquaint university and college teachers and also young scientists and research workers with the current develop-

ments in the field of Physical Organic Chemistry by providing wide-ranging discussions and series of lectures by the experts in this area and also by presentation of papers.

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