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CHROMOSOMES OF *DEIPHOBE OCELLATA* SAUSSURE (DICTYOPTERA : MANTIDAE)

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ABSTRACT

Deiphobe ocellata has karyotype of 8AA+XO. All the chromosomes are metacentric. The sex-chromosome is largest in the complement. This species of genus *Deiphobe* is considered to be more primitive than those described by Gupta (1964). Variation in their chromosome number and sex-chromosome mechanism have been discussed.

INTRODUCTION

The contribution of Indian workers in the field of mantid cytology is very limited. Asana (1934), Dutt (1954), Dasgupta (1960), Gupta (1964, 66) have studied the chromosomes of Indian mantids. Among the other workers, Oguma (1921), King (1931), White (1940, 41, 73), Hughes-Schrader (1943*a*, *b*, 50, 51) and Wahrman (1954) have helped us in understanding the cytology and cytotaxonomy of this group. Considerable range of variation in the chromosome number and in sex-determining mechanism at inter as well as intra-specific level is reported. Therefore, it is worthwhile to study related species to understand the mechanism of chromosomal polymorphism and evolutionary phenomenon. Gupta (1966) reported chromosome number and sex-chromosome mechanism in *Deiphobe brunneri* (Sauss.) and *Deiphobe indica* Giglio Tos to be 18+XO and 24+X_1X_2Y respectively. This is the third species of the same genus which further shows variation in the chromosome number.

MATERIAL AND TECHNIQUE

Only male specimens (adult) were collected from Solan (Himachal Pradesh) during the months of June-July, 1975. They were injected with 0.2 cc of 0.05% colchicine and sacrifised after four hours. Testes and hepatic caeca were treated in hypotonic solution of 0.56% KCL for 5-6 minutes and fixed in 1 : 3 Aceto-methanol. Air-dried preparations were stained in Giemsa and finally mounted in DPX. The measurements such as relative percentage lengths (L^R) and centromeric indices (I^C) were calculated according to the method of Levan *et al.* (1964) which are given in the table.

OBSERVATIONS

The meiotic divisions in the mantids are completed mostly in the last nymphal instar. Unfortunately, our specimens were adult therefore no suitable plates could be scored from the testicular material.

Observations were based on the somatic

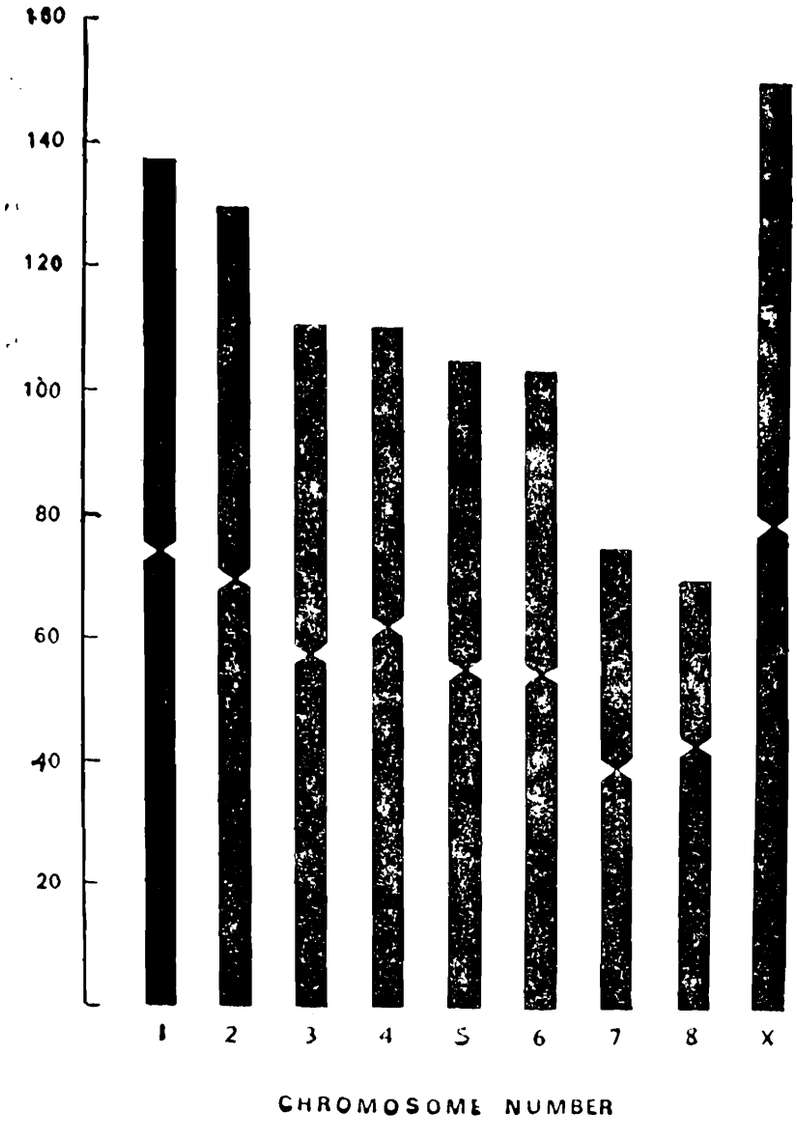

Fig. 1. Idiogram of *Deiphobe ocellata*

chromosomes from the hepatic caeca. The diploid chromosome number was observed to be 17. In all the chromosomes the centromeres are located on the median region (m). An unpaired chromosome, the largest in the complement, is the X chromosome (Fig. 1 & Pl. 1).

Discussion

Wahiman (1954) suggested that in mantids, species with low chromosome number and the sex-chromosomes as large as the autosomes, are considered to be more primitive than those which have a huge sex-chromosome compared to much smaller autosomes. Our species with 17 chromosomes apparently falls under former category and cytotaxonomically could be more primitive than *Deiphobe brunneri* having $2n\,♂ = 18+XO$ (Gupta, 1966). The XO sex-chromosome mechanism also is presumed to be primitive than X_1X_2Y system reported in *Deiphobe indica* having $2n\,♂ = 24+X_1X_2Y$ (Gupta, 1966).

TABLE 1. Measurements of the chromosome complement of *Deiphobe ocellata*

Chromosome number	1	2	3	4	5	6	7	8	X
L^R	138.24	130.66	111.46	111.46	106.24	104.73	75.93	70.71	150.53
I^C	45.71	46.14	47.58	42.55	46.26	48.55	48.11	37.53	46.75

Such an interspecific difference in chromosome numbers are presumably on the Robertsonian principle. The evolutionary equivalence of one metacentric is to two acrocentric chromosomes. The 19 and 27 numbered chromosomal species would have evolved from this 17 number metacentric chromosomal species. The X_1X_2Y system evolved in *D. indica* may be due to the reciprocal translocation between a metacentric X and an autosome, which could give rise to X_1X_2 and unaltered homologue of the autosome forms the Y chromosome. (White 1940, 41).

The presence of XO and X_1X_2Y system and such a wide variation in the chromosome number in the genus *Delphobe* is of utmost evolutionary impotrance, and needs further exhaustive cytological probe at the population level.

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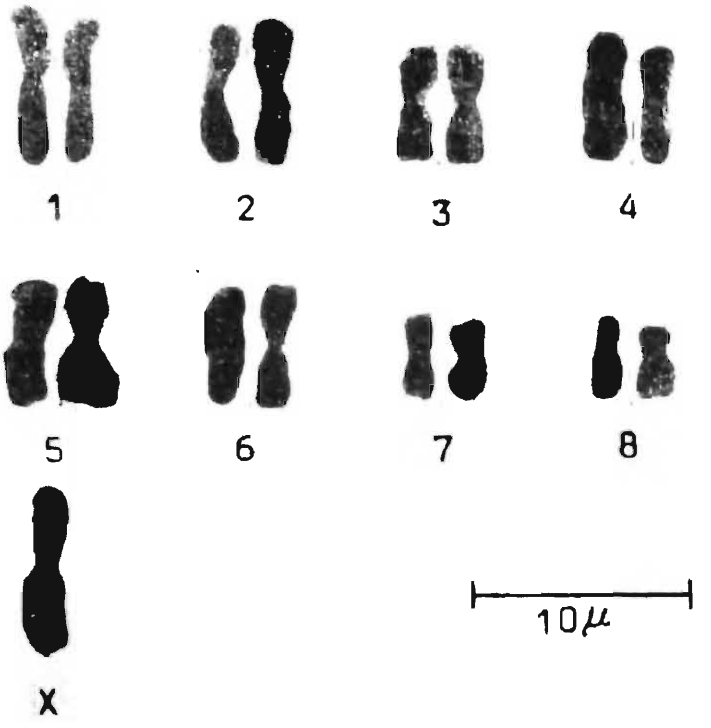
SINGH & KACKER PLATE I



Karyotype of *Diephobe ocellata*