

# CHROMOSOMES OF *TYPHOPHTERA DONOVANI* DON. (TETTIGONIDÆ)

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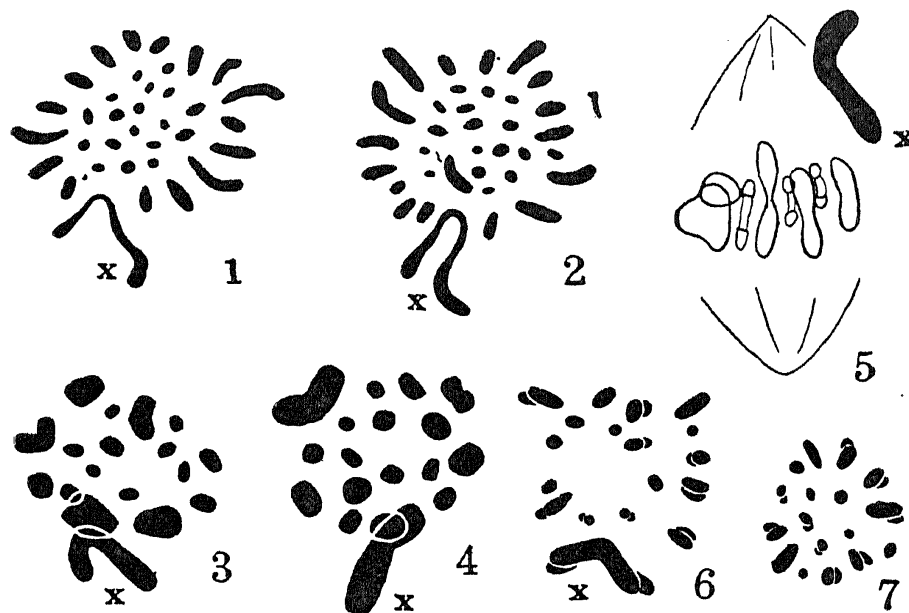
## 1. *Material and Method*

*Typhophtera donovani* Don. is a very interesting Orthopteran insect furnishing a striking example of protective colouration. The colouration of its wings is very similar to that of a dead and decaying wet leaf, showing yellowish green patches of irregular outline on a brown or dark brown background with prominent venation. Specimens were obtained from small shrubs and trees near the hedges of cultivated fields in the vicinity of the Gujarat College, Ahmedabad, Western India. These were obtained in the latter half of August and early September during the monsoon of 1937, 1938 and 1939. They are by no means common and are not easily found. The author is greatly indebted to Dr. H. S. Pruthi, Imperial Entomologist, Agricultural Research Station, New Delhi, who identified these specimens and who has been doing similar favours from time to time which is of great assistance in our research work.

Specimens were killed by pouring a little xylol over them soon after they were obtained, testes were quickly dissected out in normal saline and fixed in two or three modifications of strong Flemming with considerably reduced proportions of glacial acetic acid, and in several cases with only a trace of it. Modifications of Flemming are obtained by diluting the stock solution at the time of fixing by adding distilled water in varying proportions. A fixative, for instance, containing only one part of strong Flemming to four parts of distilled water with only a drop of glacial acetic to every 5 c.c. of this fluid is equally effective. The material was left in the fixatives from about 20 to 24 hours, washed for an equal length of time and was dehydrated and cleared either in varying mixtures of dioxane and distilled water or ethyl alcohol and distilled water in graded series of 2½ and 5 per cent. After it was embedded in paraffin, sections 12μ in thickness were cut, bleached, mordanted in 2½ to 3 per cent. solution of iron alum for 25 minutes only, washed in running water 3 to 4 minutes and stained in ½ per cent. hæmatoxylin for 2 to 4 hours or overnight.

## 2. Observations

Chromosomes of Tettigonidæ are comparatively very small when viewed against those of Acrididæ. *Typhoptera donovani* Don. is the ninth form in the series of Indian Tettigonidæ so far examined (Asana, Makino and Niiyama, 1938). Figs. 1-2 are examples of many spermatogonial metaphase plates observed. 35 chromosomes have been counted in the equatorial plates. The chromosomal complex of this species as seen in the diploid stage resembles the chromosome complements of *Concephalus* sp. (Asana, Makino and Niiyama, 1938), *Xiphidion gladiatum* (Ohmachi and Sokame, 1935), *Orchelimum vulgare* and *O. concinnum* (King, 1924). It differs from them in the number of its chromosomes, there being 35 spermatogonial chromosomes in it, while the other forms have 33 (see Figs. 1 and 2). The spermatogonial chromosomes of *Typhoptera donovani* Don. form a motley garniture and consist of 18 minute spheroidal elements, 16 long and medium sized rods and a solitary X-chromosome which is the largest and is V-shaped. When we compare this diploid garniture of *T. donovani* Don. with the chromosomal complex of the same stage in *Concephalus* sp. studied by Asana, Makino and Niiyama (1938), it becomes evident that the latter form possesses in its spermatogonial complement two V-shaped autosomal chromosomes, while no such elements are found in the species which is the subject-matter of this paper.



Chromosomes of *Typhoptera donovani* Don., Tettigonidæ (Orthoptera).  $\times 3,500$

Coming to the metaphase of the primary spermatocytes 17 bivalents and an X-chromosome are found in the equatorial plate as seen in Figs. 3 and 4. The X-chromosome at this stage has its apex always directed

towards one of the poles and runs ahead of the others (Fig. 5). As a result of this division of the primary spermatocytes there are produced two kinds of secondary spermatocytes, one group have the *x*-element and the other are without it. This is clearly seen in the metaphase plates of the secondary spermatocytes as shown in Figs. 6 and 7 where a representative of one class (Fig. 6) has 18 chromosomes including the *x*-element, while a representative of the other class (Fig. 7) has no such chromosome in its complement.

#### LITERATURE CITED

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