

SHORT COMMUNICATION

A NEW FINDING OF B-CHROMOSOMES IN *Drosophila kikkawai* BURLA

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ABSTRACT

Two types of B-chromosomes, a metacentric and a submetacentric, are recorded for the first time in *Drosophila kikkawai* collected from Bhubaneswar in India. Individuals with one or both types in different combinations were found in nature. Their relative frequencies in the mass culture laboratory stock were also determined.

Although many species of animals are known to possess B-chromosomes (Jones, 1975), their occurrence in the genus *Drosophila* has been a recent discovery. Over 1600 valid species represent the genus *Drosophila* alone in the family Drosophilidae (Wheeler, 1981, 1986), of which only two species are known so far to contain B-chromosomes. They include *D. albomicans* (Clyde, 1980) and *D. malerkotliana* (Tonomura and Tobari, 1983). In both the species B-chromosomes are found in the form of heterochromatic dots. In case of the former species some studies relating with the effects of B-chromosomes have also been carried out (Ramachandra and Ranganath, 1986).

While analysing several geographical populations of *D. kikkawai*, both from India and abroad, it was noticed that one of the Indian populations of this species obtained from Bhubaneswar (Orissa) had B-chromosomes. This discovery makes *D. kikkawai* the third species in the genus *Drosophila* found to contain B-chromosomes. Our studies further revealed that there are two types of B-chromosomes in *D. kikkawai*, one type being a small metacentric, while the other a slightly larger submetacentric, arbitrarily designated as B₁ and B₂ respectively (Figure 1). Individuals having different combinations of these B-chromosomes were found in nature. The laboratory studies also showed that these chromosomes are

meiotically unstable, but mitotically are very stable. The frequencies of larvae with the various types of B-chromosomes in the mass culture laboratory stock were determined (Table I).

Table I - Frequency of two types of B-chromosomes observed in the mass culture laboratory stock of *Drosophila kikkawai*.

No.	Type	Frequency (%)
1.	Larvae without 'B' chromosomes	60.53
2.	Larvae with 'B ₁ '	17.36
3.	Larvae with 'B ₂ '	12.11
4.	Larvae with 2 'B ₁ '	4.74
5.	Larvae with 2 'B ₂ '	3.16
6.	Larvae with 1 'B ₁ ' + 'B ₂ '	2.11

The analysis of polytene nuclei of larvae containing B-chromosomes revealed no additional arm as it probably remained embedded in the common chromocentre because of being highly heterochromatic in nature.

The B-chromosomes of *D. kikkawai* are different altogether from the type detected earlier in two other species of *Drosophila* (Clyde, 1980, Tonomura and Tobari, 1983), particularly in having a large size with a distinct centromeric position.

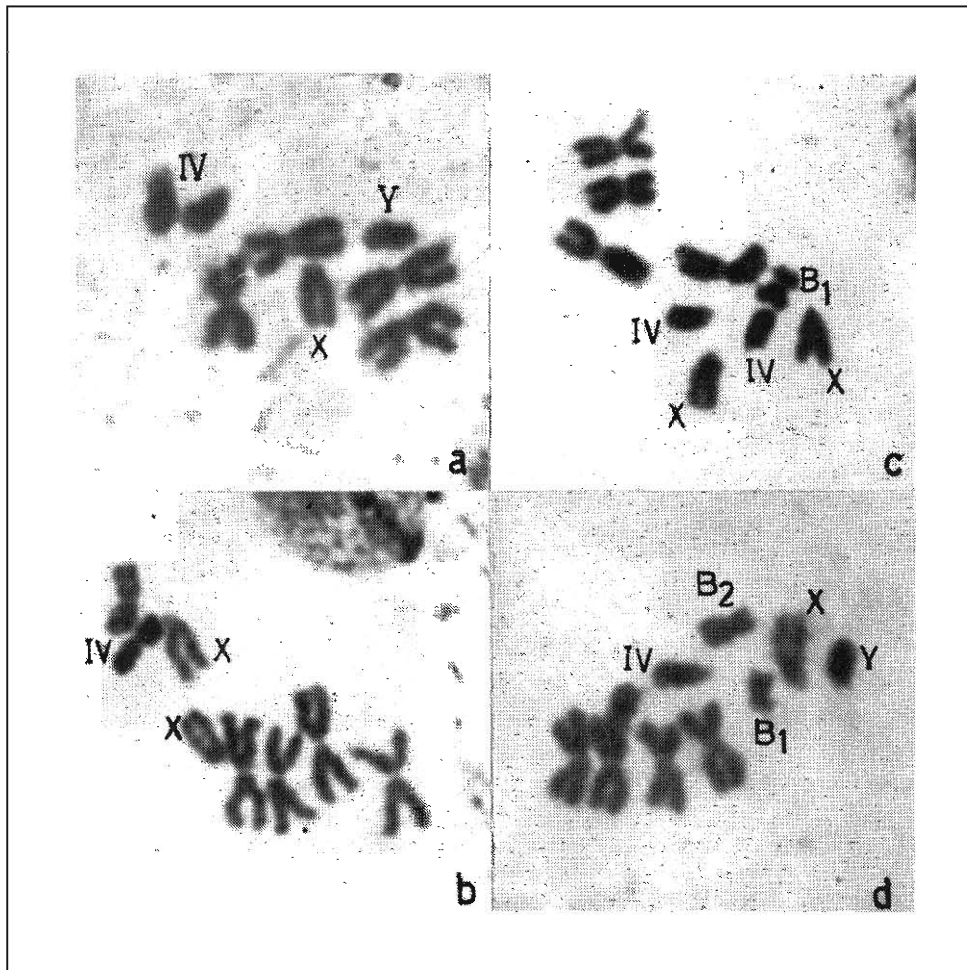


Figure 1 - *Drosophila kikkawai* - Karyotypes: a, normal male; b, normal female, c, with B₁ type of B-chromosome; d, with B₁ and B₂ types of B-chromosomes.

ACKNOWLEDGMENTS

The authors are grateful to U.G.C., New Delhi for financial assistance in the form of SRF under CAS Programme in Zoology to AKS.

RESUMO

Foram registrados dois tipos de cromossomos B, um metacêntrico e um submetacêntrico, na primeira coleta de *Drosophila kikkawai* de Bhubaneswar, na Índia. Indivíduos com um ou ambos tipos em diferentes combinações foram encontrados na natureza. A frequência relativa em massa, em cultura de laboratório, também foi estudada.

REFERENCES

- Clyde, M. (1980). Chromosome IV variation in *Drosophila albomicans* Duda. *Droso. Inform. Serv.* 55: 25-26.
- Jones, R.N. (1975). B-chromosome systems in flowering plants and animals. *Int. Rev. Cytol.* 40: 1-100.

- Jones, R.N. and Rees, H. (1982). *B-Chromosomes*. Academic Press, New York, pp. 1-266.
- Ramachandra, N.B. and Ranganath, H.A. (1986). Analysis of resource utilization divergence in two strains of *Drosophila nasuta albomicana* with and without B-chromosome. *Indian J. Exp. Biol.* 24: 404-407.
- Tonomura, Y. and Tobari, Y.N. (1983). Y-Chromosome variation and B-chromosome in *Drosophila makerkottiana*. *Sci. Rep. Tokyo Women's Christian Univ.* 32: 705-711.
- Wheeler, M.R. (1981). The Drosophilidae: A taxonomic overview. In: *The Genetics and Biology of Drosophila*. (Ashburner, M., Carson, H.L. and Thompson Jr., J.N., eds.). Academic Press, New York, Vol. 3a, pp. 1-97.
- Wheeler, M.R. (1986). Addition to the catalog of worlds Drosophilidae. In: *The Genetics and Biology of Drosophila*. (Ashburner, M., Carson, H.L. and Thompson Jr., J.N., eds.). Academic Press, New York, Vol. 3e, pp. 395-409.

(Received November 8, 1993)