

SHORT PAPERS

A case of chromosome dissociation in a shrew

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SUMMARY

A male common shrew trapped at Bonn/BRD was found to have a karyotype differing from the normal karyotype by a dissociation of a large metacentric chromosome. Similar findings are hitherto unknown in mammals.

Robertsonian changes in which a metacentric chromosome has arisen from two acrocentric chromosomes have frequently been recorded in mammalian species (Hsu & Mead, 1969; Ford & Hamerton, 1970). But there appears to be no published account of the converse change, namely the origin of two acrocentric chromosomes from one metacentric chromosome. Such a change has recently been observed in a shrew, *Sorex gemellus* (Ott, 1968), and an account is given below of the relevant observations.

In a relatively isolated small swamp in the country surrounding Bonn (Germany) 14 shrews of the species *Sorex gemellus* were trapped and cytogenetically examined. One male animal showed an abnormal karyotype with $2N = 24$ characterized by the replacement of a large metacentric chromosome by two acrocentric chromosomes (Plate 1). The normal complement is ♀ $2N = 22$; ♂ $2N = 23$. Because of the small dimensions of the trapping area this male shrew and the 13 animals with normal karyotype probably belonged to the same population. In consequence of the animal's youth meiotic preparations could not be made.

Table 1. *Metaphase counts on ♂ with abnormal karyotype*

Tissue	Cells counted	No. with $2N$		
		24	23	22
Bone marrow	50	44	2	4
Spleen	20	19	1	0
Lymphatic node	20	18	1	1

The data obtained from three different tissues (Table 1) make it unlikely that the animal was a mosaic in which the change arose during early development. A plausible mechanism of origin for this dissociation could be provided by (1) symmetrical incomplete chromatid interchange or (2) centric fission. Ohno *et al.* (1965) described a reversible process of association of acrocentric chromosomes from metacentrics and subsequent dissociation of the metacentrics to acrocentrics as a normal part of the life-cycle in the rainbow trout. A process involving two chromosome breakages and one translocation was proposed by Sturtevant & Tan (1937), who put forward the idea that the Y-chromosome could serve as a centromere donator. The mechanism responsible for the origin of the acrocentric chromosomes of the male shrew cannot be determined.

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REFERENCES

- FORD, C. E. & HAMERTON, J. L. (1970). Chromosome polymorphism in the common shrew, *Sorex araneus*. *Symposia of the Zoological Society, London* **26**, 223–236.
- HSU, T. C. & MEAD, R. A. (1969). Mechanisms of chromosomal changes in mammalian speciation. In *Comparative Mammalian Cytogenetics* (ed. K. Benirschke), pp. 8–17. New York: Springer-Verlag.
- OHNO, S., STENIUS, C., FAISST, E. & ZENZES, M. T. (1965). Post-zygotic chromosomal rearrangements in rainbow trout (*Salmo irideus* Gibbons). *Cytogenetics* **4**, 117–129.
- OTT, J. (1968). Nachweis natürlicher reproduktiver Isolation zwischen *Sorex gemellus* sp.n. und *Sorex araneus* Linnaeus 1758 in der Schweiz. *Revue Suisse de Zoologie* **75**, 53–75.
- STURTEVANT, A. H. & TAN, C. C. (1937). The comparative genetics of *Drosophila pseudoobscura* and *D. melanogaster*. *Journal of Genetics* **34**, 417.