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On the Chromosomes of the shrew, *Sorex unguiculatus*¹⁾

By

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(With 2 Text-figures and 1 Table)

Along with the striking increase in technical competence, cytogenetics has recently been contributing as useful tools to the study of mammalian taxonomy and evolution. Along this line, studies have been carried out extensively on the chromosomes in mammals based on the reliable karyotypic analysis, with valuable information on intraspecific variations and polymorphisms of chromosomes. In this connection, efforts have been demanded to investigate the chromosomes in a large number of specimens of a single species.

The chromosomes of the common shrew (*Sorex araneus* L.) were investigated in considerable detail by Sharman (1956) and Ford *et al.* (1957), and an interesting chromosome polymorphism was noted in this species. Recently Takagi and Fujimaki (1966) reported 42 chromosomes in two species of shrews, *Sorex shinto saevus* Thomas and *Sorex unguiculatus* Dobson, use being made of the tissue culture technique. The authors studied in some detail the chromosomes of the shrew, *Sorex unguiculatus*, with some interest in the occurrence of chromosome polymorphism.

Materials and Methods: Animals were captured at Shinkototoni, the northern suburb of Sapporo, in June and July, 1968. Marrow cells and pieces of fetal tissues were cultivated at 37°C with TC-109 85% and calf serum 15%. After colchicine (1.5 hr) and hypotonic treatments, chromosome slides were made according to the routine air-drying method with Giemsa staining.

Results and Remarks

The present study confirmed the results reported by Takagi and Fujimaki (1966) for the present species (*Sorex unguiculatus*) in both number and general morphology.

The study was carried out on the basis of well-spread metaphase cells derived from five males, four females, and eleven fetuses. Chromosome counts showed a modal chromosome number of 42. Karyotype analysis revealed that the chromosome constitution was obtained as 42, XY for males from 5 adults and 5 fetuses, and 42, XX for females from 4 adults and 6 fetuses (Table 1). There were aneuploid

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cells due to random missing or addition of certain element. The modal chromosomes were aligned into 20 pairs of autosomes and a pair of the sex chromosomes (Figs. 1-2). Autosomes were divided into two groups based on their centromere positions. They consisted of 9 pairs of larger meta- or submetacentrics, 1 pair of small meta- or submetacentrics, and 10 pairs of telocentrics. Nine pairs of meta- or submetacentrics were readily distinguishable from others on account of their

Table 1. Chromosome counts in the shrew, *Sorex unguiculatus*

Number of specimens	Chromosome count				Total no. of cells	Chromosome constitution
	40	41	42	43		
5♂		15	79		94	42, XY
4♀	1	10	79	1	91	42, XX
5F*	3	9	77	2	91	42, XY
6F	1	10	83	3	97	42, XX
20	5	44	318	6	373	

* F indicates fetuses derived from three females.



Figs. 1 and 2. Two representative karyotypes with 42 chromosomes of the shrew. 1: karyotype with 42, XY, from a male. 2: karyotype with 42, XX, from a female.

large size. Satellites were often recognizable in two pairs of telocentrics, chromosome nos. 17 and 19. The X chromosome was largest acrocentric chromosome

ranking in size between chromosome no. 5 and no. 9, while the Y was telocentric being similar in size to chromosome no. 18.

Sharman (1956) and Ford *et al.* (1957) reported that the diploid number varied from 22 to 27 in the common shrew, *Sorex araneus* L. The present study provided no evidence for chromosomal polymorphism in relation to numerical or morphological variations, so far as the present materials are concerned.

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