

CHROMOSOMAL ANALYSIS OF *SUNCUS MURINUS* (LINN.) FROM POONA (INDIA)

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ABSTRACT

Detailed morphometric data of chromosomes, karyotype and idiogram of *Suncus murinus* (Linn.) from Poona are presented. A comparison is made between earlier reported chromosome numbers and karyotypes of this species and those found in the present study.

INTRODUCTION

It is well known that mammals show a wide variation in their diploid number of chromosomes, as well as in their karyotypes. A large number of workers have reported such cases in a number of mammalian species. Review of literature shows that the insectivora are not an exception. The family Soricidae, belonging to this order illustrates some interesting cytogenetic mechanisms¹. *Sorex araneus*, a European insectivore, belonging to this family has been extensively studied¹.

In the present study, another species, *Suncus murinus* belonging to the same family was investigated. Detailed chromosomal analysis of specimens of this species from Poona (18° 31' north latitude, 73° 51' east longitude) is presented here in comparison with the earlier reported chromosome numbers and karyotypes.

MATERIALS AND METHODS

A total of twenty-five specimens (twelve males and thirteen females) collected from Poona were used for chromosomal analysis. The specimens were identified to be *Suncus murinus* (Linn.) with the help of the Zoological Survey of India, Western Regional Station, Poona.

Bone marrow cells were used for preparing slides using the technique described by Raymond Lee², with the following modifications. For hypotonic treatment, 0.563% potassium chloride was used in place of 1.0% sodium citrate as it was found to give better results. Slides were prepared both by air drying and flame drying methods and were stained with buffered Giemsa (pH 6.8). A minimum of hundred metaphases were examined from every individual to determine the diploid number. The total number of major autosomal arms (NA) was calculated by considering one banded chromosome as two arms and an acrocentric autosome as one arm³.

RESULTS AND DISCUSSION

All specimens showed $2n = 40$. The karyotype consists of three pairs of metacentric, two pairs of

subacrocentric and fourteen pairs of acrocentric chromosomes. The submetacentric X chromosome is the longest chromosome in the complement and measures about 11.82% of the haploid genome. The Y chromosome is subacrocentric and is 3.94% of the haploid genome. The smallest acrocentric chromosome in the complement contributes 1.64% of the haploid genome (Tables I and II, Figs. 1 and 2).

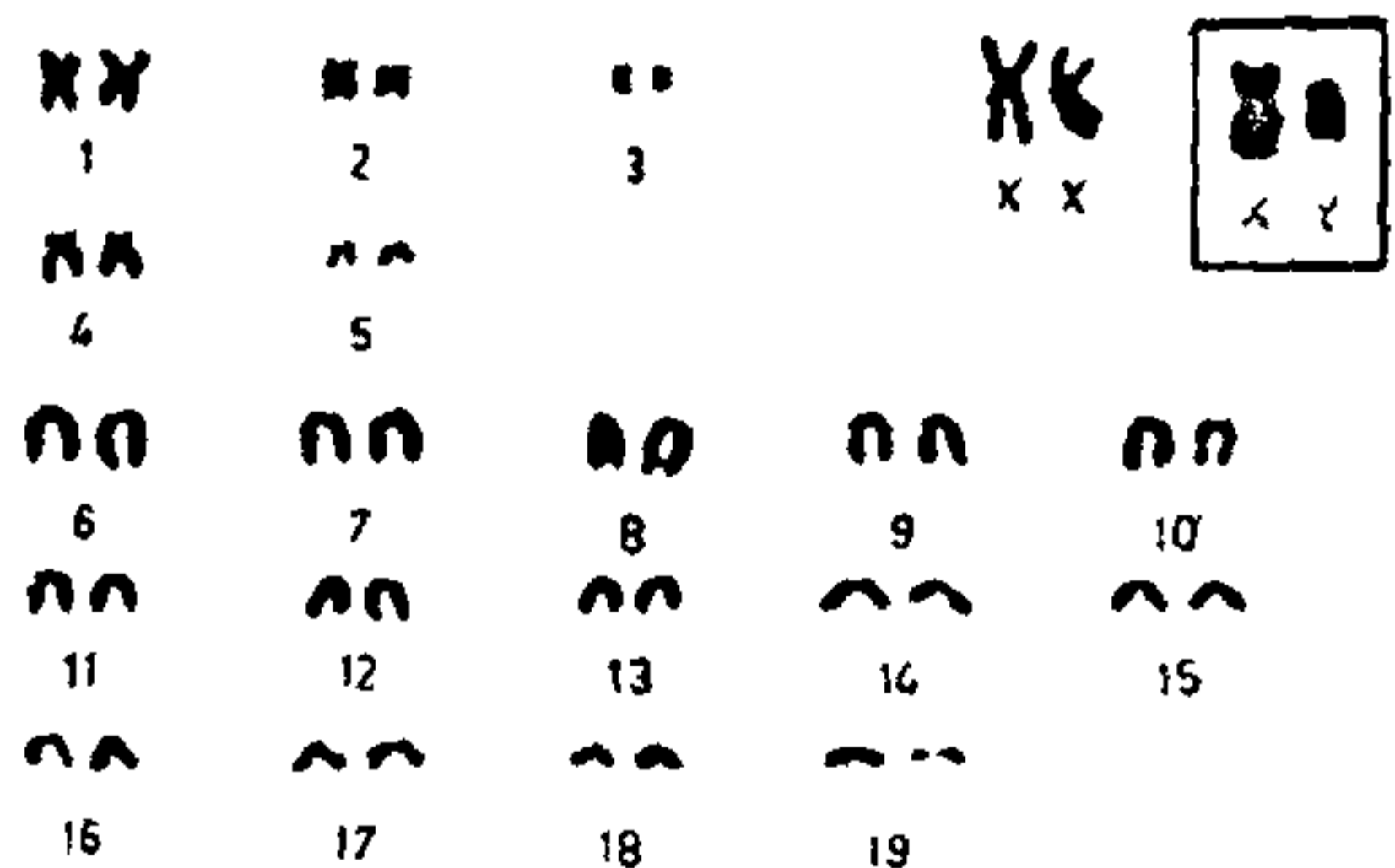


FIG. 1. Karyotype of female *Suncus murinus*. The inset shows male sex chromosomes.

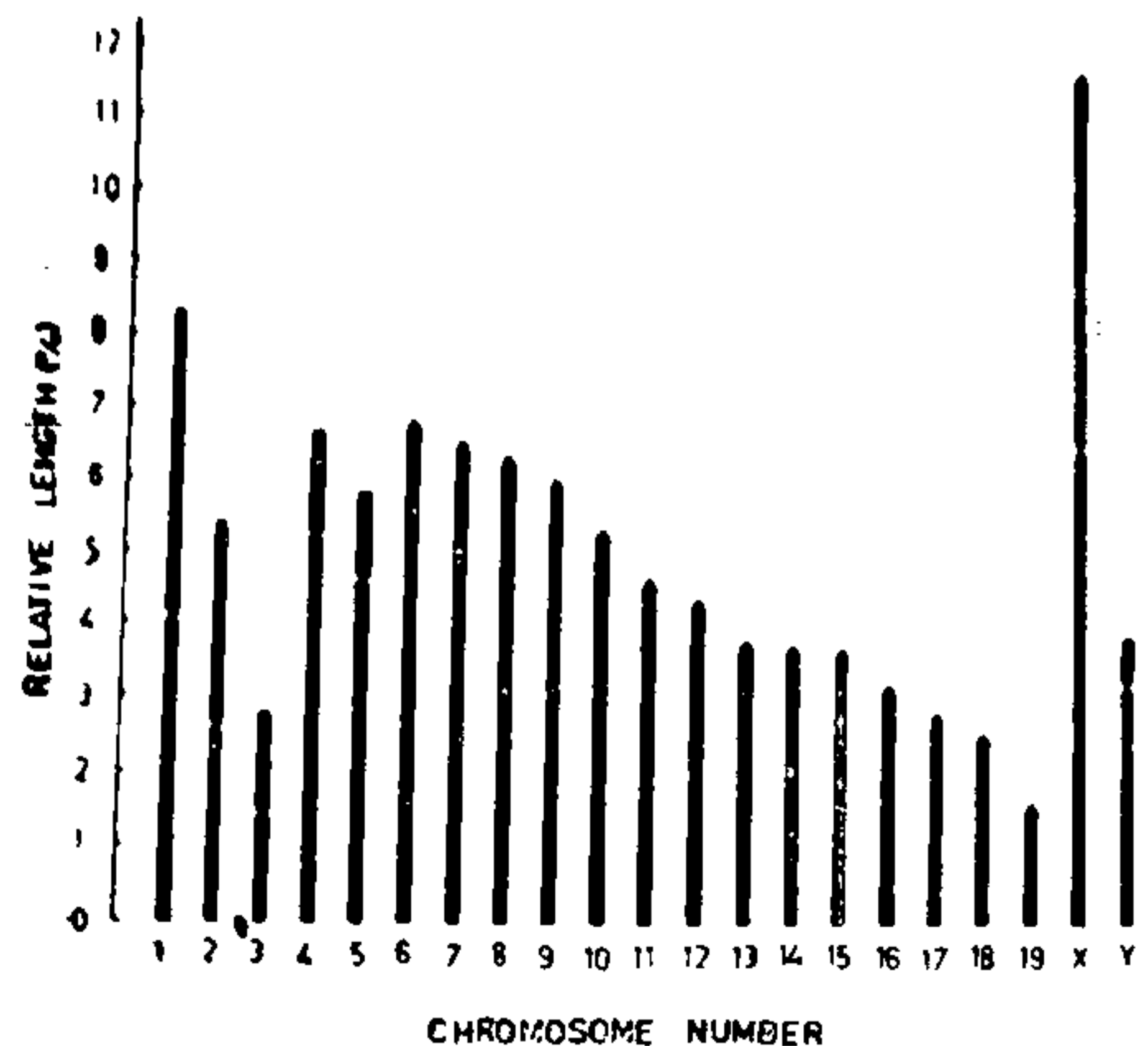


FIG. 2. Idiogram of male *Suncus murinus*.

TABLE I

Taxa	Autosomes					X	Y	NA
	2n	m	sm	sa	a			
Indian (Delhi and Varanasi)*	40	6	2	4	26	m	sm	50
Indian (West Bengal)*	40	4	0	6	28	sa	a	48
Japanese*	40	4	4	2	28	sm	sm	48
South Vietnamese*	40	6	2	4	26	m	[a	50
Malaysian (K. Lumpur and P. Jaya)*	40	6	2	6	24	m-sm	m	52
Malaysian (Malacca)*	40	6	2	6	24	m-sm	sm	52
Indian (Poona)**	40	6	0	4	28	sm	sa	48

m, metacentric; sm, submetacentric; sa, subacrocentric; a, acrocentric. NA, number of major autosoma arms; * from literature; ** present study.

TABLE II

Taxa	% Relative length of sex chromosomes		Y/X	(X + Y)%
	X	Y		
Delhi (India)*	11.2	8.6	0.8	19.8
Varanasi (India)*	9.9	7.7	0.8	17.6
K. Lumpur and P. Jaya (Malaysia)*	9.7-11.4	~4.0	~0.35	13.7-15.4
Malacca (Malaysia)*	9.0-10.3	6.0-7.5	0.6-0.8	15.0-17.5
Poona (India)**	11.82±0.42	3.94±0.37	0.33	15.76

* from literature; ** present study (Value of X and Y with S.D.).

The diploid number of this species has been reported to be 40 by most of the earlier workers⁴⁻⁷. However, Yong⁸ reported *S. murinus* specimens from West Malaysia with diploid numbers, 40, 26, 37, 38 and 39.

Satya Prakash and Aswathanarayana⁹ have reported house shrews of this species from different regions of southern India with diploid numbers, 40, 30 and 32.

Thus, specimens from different regions show distinct variations in the number of the chromosomes. The karyotype of the Poona population is distinctly different from any of those reported earlier. Three pairs of metacentric chromosomes were found as in two other Indian (Delhi and Varanasi), South Vietnamese and West Malaysian (K. Lumpur and Petalling Jaya and Malacca) taxa. In all other reported cases, the number of biarmed chromosomes other than metacentric is either 6 or 8. In the present case, however, this number is 4, thus representing the lowest of its kind. Further the fact that the total number of biarmed chromosomes remains same (10) in the three taxa, viz., the Japanese, W. Bengal (India) and the Poona taxon (present study), the distribution of these ten chromosomes in different categories differs (Table I).

The number of acrocentric chromosomes reported in the present study (14 pairs) corresponds only with that of W. Bengal and Japanese taxa. The number of major autosomal arms (NA) is also the same in these three taxa (48). Remaining taxa show NA more than 48 (Table I).

The sex chromosomes also show variations. The X chromosome in the present study is submetacentric resembling in general morphology with X chromosomes of Japanese and Malaysian specimens (Table I). The relative length of X in present study is 12.82%. This value is almost close to that described for Delhi (India) and K. Lumpur and Petalling Jaya (Malaysia) specimens (Table II). The Y chromosome in the present study contributes 3.94% of the haploid genome. A similar situation exists only in K. Lumpur and Petalling Jaya specimens (Table II). The Y/X ratio in these two cases is also very close. Lastly, the (X + Y) values for all taxa reported so far are interestingly close to one another, despite the difference in their Y/X ratios.

It is thus clear that *S. murinus* specimens from Poona show a karyotype which, as a whole, differs from any of those reported so far. While the auto-

some of these specimens show similarity with those of specimens from W. Bengal and Japan, the sex chromosomes are more alike to those present in W. Malaysian specimens.

It would be difficult, however, to ascertain the exact roles of Robertsonian translocations and pericentric inversions in chromosomal variations in *Suncus murinus* unless banding patterns of all varieties are available for a critical comparison. In view of the closeness between X + Y values for all taxa it is suggested that an exchange of genetic material might have taken place between X and Y during evolution.

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