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GIEMSA BANDING PATTERN IN THE LANGUR MONKEY—*PRESBYTIS ENTELLUS ENTELLUS* (DUFR.)

Presbytis entellus entellus is a hylobate, commonly known as Indian Hanuman langur. Though cytogenetic studies in *Presbytis* have been reported earlier[1–4], the Giemsa banding pattern of the metaphase chromosomes have not been investgated in this species. The karyotype analysis is constructed based upon the size of chromosome, position of the centromere and the characteristic banding pattern.

Metaphase chromosome spreads were prepared by culturing the peripheral blood, as per the standard procedure[5]. Slides were dried on a hot plate (50°–60° C) for 1–2 minutes after fixing. Giemsa trypsin banding was carried out according to modified procedure of Sun *et al.*[6].

Heat-dried slides were allowed to age for 3–4 days, and incubated at 60° C overnight (16–18 h). The slides were then incubated in phosphate buffer, 0·025 M, pH 6·8, at 56° for 10 minutes. The excess buffer was blotted off. The slides were flooded for 5 minutes with the staining mixture prepared as follows: 36·5 ml of phosphate buffer, 12·5 ml of AR grade methanol, 0·25 ml of trypsin–EDTA and 1·0 ml of 1% Giemsa stock solution. The slides were rinsed twice with distilled water, dried and mounted in neutral mounting medium.

A total of 110 metaphases were analysed and the diploid chromosome number $2n = 44$ was consistent in all the cells. The karyotype is comparable with that in earlier reports[1–4]. A typical Giemsa banded metaphase spread is shown in Fig. 1. The characteristic banding pattern enabled precise identification of the homologous pairs of autosomes and construction of the karyotype (Figs. 2 and 3).

From the Giemsa banding pattern, it is obvious that the autosome pairs 7 and 17 show a characteristic secondary constriction. Pair 17, characteristic of the genus[7], is a submetacentric chromosome with an exceptionally large achromatic gap in the long arm (marked secondary constriction). There is a wide variation in the size of this achromatic gap between the two homologues within the same metaphase spread and in the same animal, leading to an apparent variation in the length of the two chromosomes. The homologues also have a tendency for association in metaphase spreads. The Y chromosome in this species, the smallest of the complement, is an acrocentric

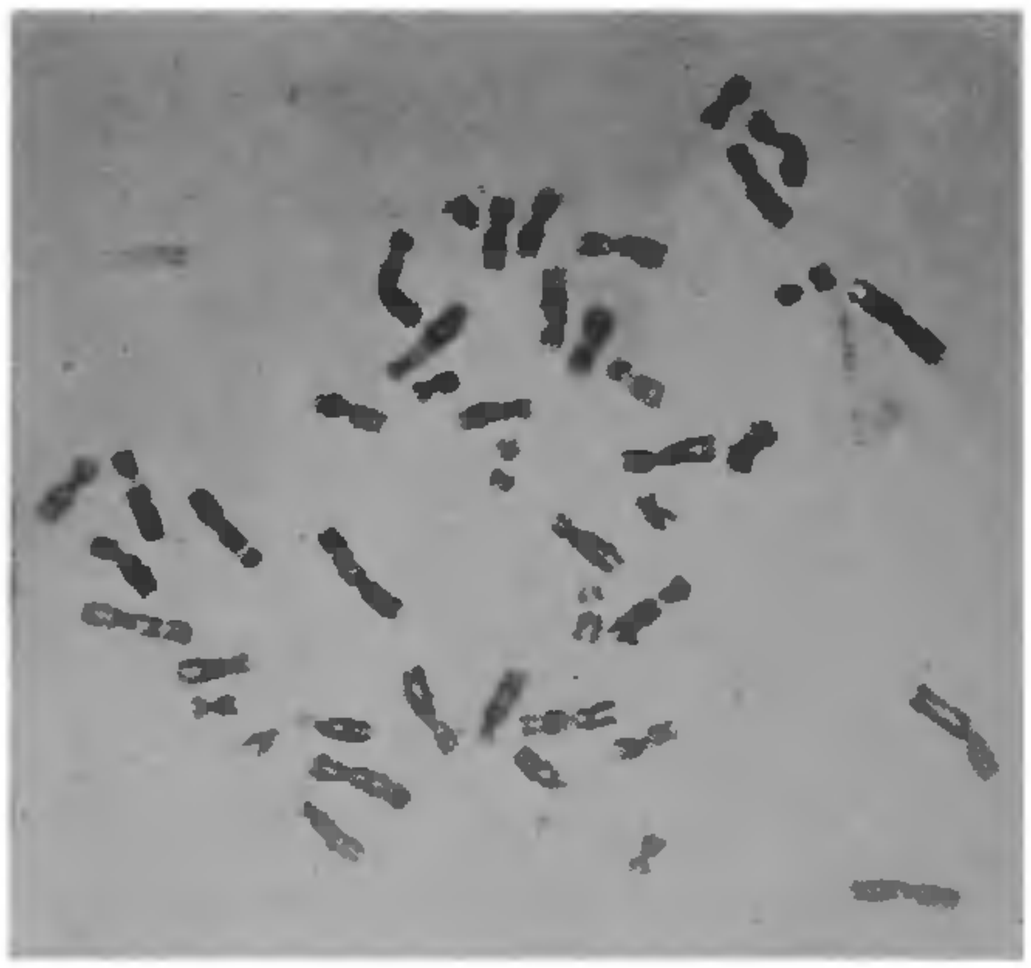

FIG. 1. Giemsa banded metaphase spread ($2n = 44$, XX).

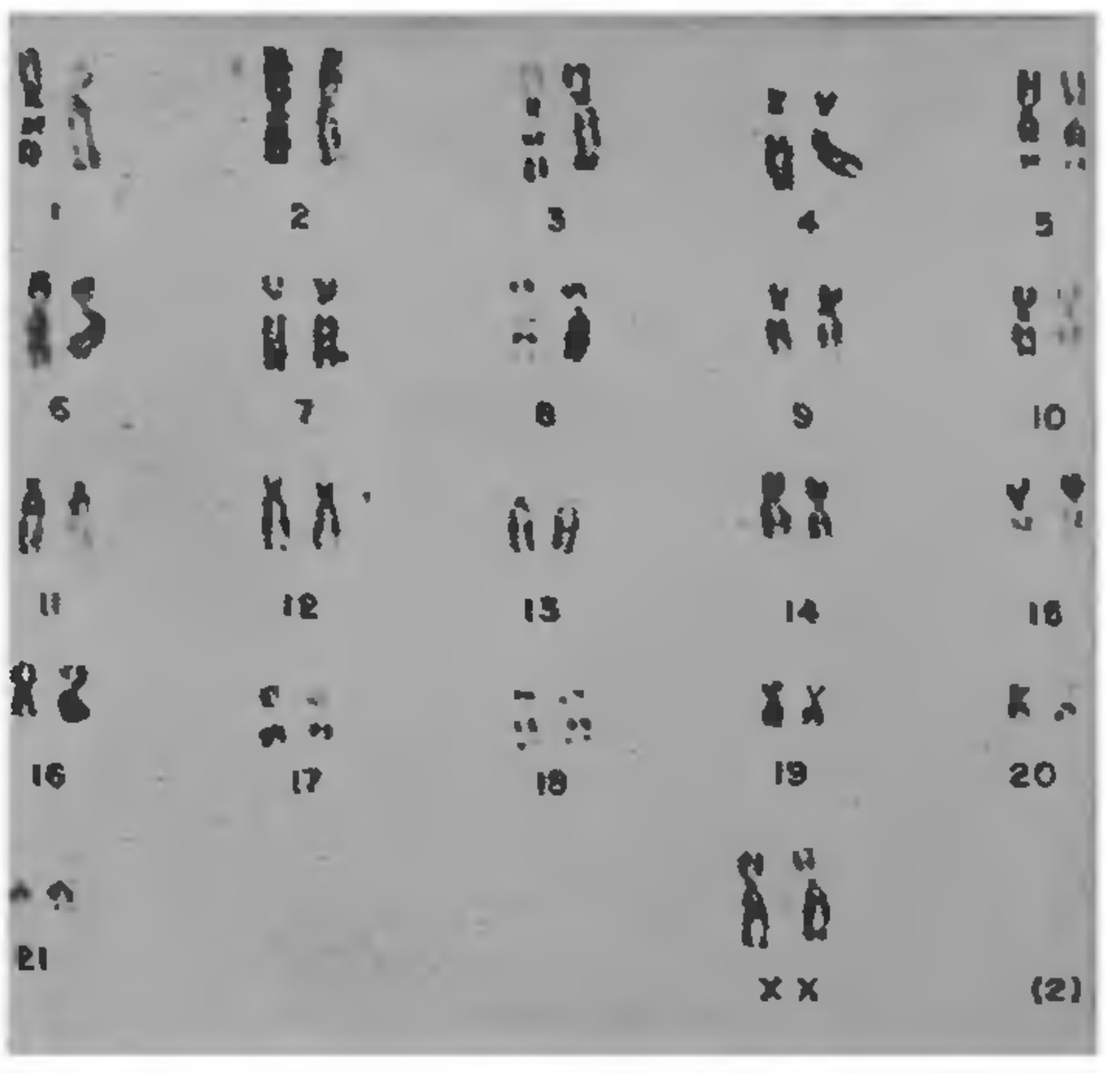

FIG. 2. Karyotype of female *Presbytis entellus entellus* (dufr.).

chromosome as described by Sharma and Kakati[3]. On the other hand, Ushijima *et al.*[2] have reported a much larger and submetacentric Y chromosome for this species. This may represent polymorphism of the Y chromosome.

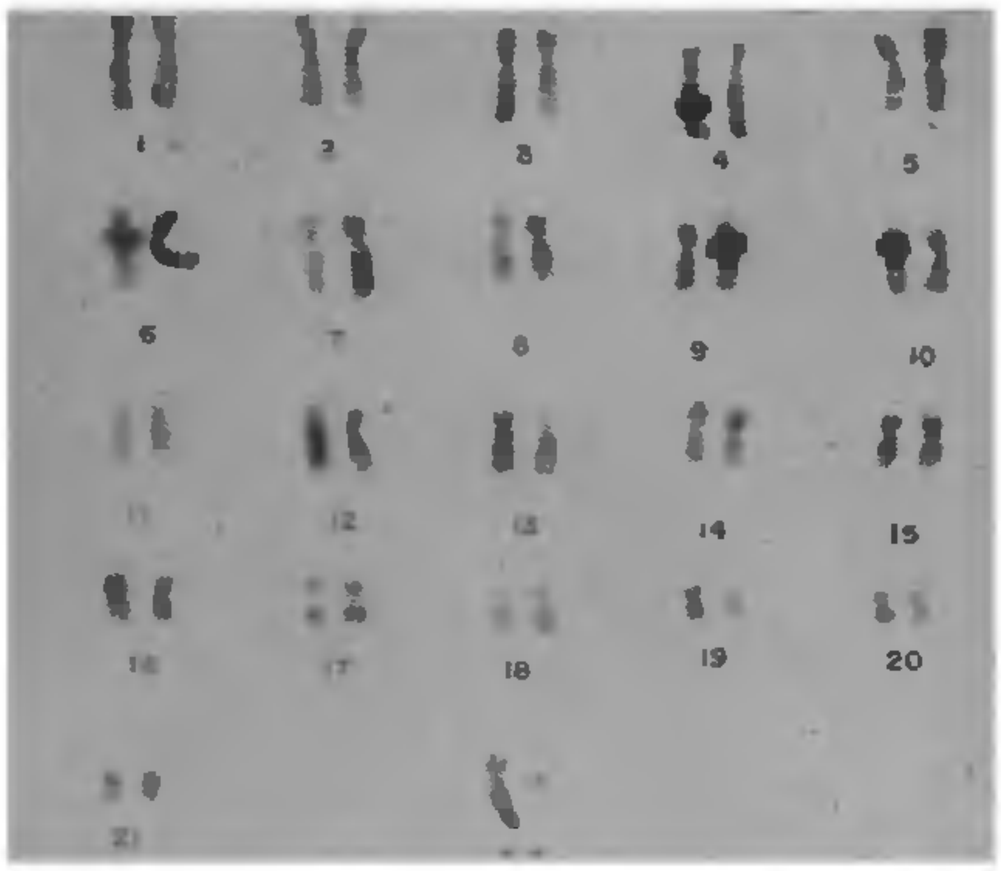

FIG. 3. Karyotype of male *Presbytis entellus entellus* (dufr.).

Application of the other staining techniques, particularly quinacrine fluorescence banding, C banding and the silver staining techniques should lead to an understanding of the homology of *Presbytis* chromosomes with those of other primates.

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SIGNIFICANCE OF VENTRAL LUMINESCENCE OF SILVER-BELLIES (FAM.: LEIOGNATHIDAE)

THE catches of silver-bellies in bottom trawls were found to vary between the day and night times. The ventral luminescence of leiognathids appears to be one possible reason for the variation.

Data on leiognathid catches by bottom trawls were collected from the local fish landing centre (Porto Novo) for a period of one year from June, 1976 to May, 1977. The average catch of leiognathids per boat per day was estimated for each month. Haulings of trawl nets between 06·00 A.M. and 06·00 P.M. were regarded as day operations and between 06·00 P.M. and 06·00 A.M. as night. The boat net combination was treated as unit effort and the catch per unit effort (CPUE) was calculated.

Table I shows the diurnal variations in catches and the average catch per unit effort was highest in July, 1976 (360·6 kg) during the day. The highest landings during night for the entire period was 39·0 kg during September, 1976. The lowest average catch during the day was in April, 1977 (51·4 kg) and 8·5 kg was the minimum in May, 1977 during night operations

The luminescent system in the silver-belly has been studied by Harms[1], Haneda[2] and Haneda and Tsuji[3,4]. Basically, the system consists of a light organ harbouring the symbiotic luminescent bacteria[2,4–6], a reflector, lens and other accessory structures producing, transmitting and diffusing bacterial light of regulated intensity over the ventral surface of the body[2,4,5].

Balan[7] reported a good catch of *Leiognathus bindus* off the coast of Calicut from the surface and the subsurface waters during the dark phases of the moon and foggy nights and also stated that the detection and the capture in huge quantities of this fish during dark nights must be due to the luminescence emitted by the shoals of this species. Hastings[8] suggested that ventral luminescence is used by silver-bellies to match the downwelling ambient light so as to conceal their silhouettes from predators. He believed that the regulation of light and the optical arrangement provided a continuously available but readily variable ventral glow to match the background light. Such bioluminescence in marine organisms has been suggested by Jerzmańska[9], Fraser[10], McAlister[11], Young[12] and Lawry[13]. Later studies by Hastings[14] during the second *Alpha helix* Cruise (1975) revealed that the ventral bioluminescence of leiognathids was in direct proportion to the light coming from above, as brighter overhead light induced brighter ventral luminescence. Haneda and Tsuji[4] supported this with their observations in *L. nuchalis* and stated that the varying intensity of luminescence emitted from the sexually dimorphic light organs of *L. elongatus* and *L. rivulatus* may have sexual functions such as communication between sexes, that is, to aid in aggregation and mating.