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Cytogenetic Study of *Allocebus trichotis*, a Malagasy Prosimian

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A cytogenetic study of a female *Allocebus trichotis* was conducted using R-, G-, and C-banding. Its karyotype does not differ from those of the other Cheirogaleinae (*Microcebus, Cheirogaleus,* and *Mirza*). The absence of chromosomal rearrangement in speciation in this group is discussed.

Key words: lemur, *Allocebus trichotis*, cytogenetics

INTRODUCTION

According to the classification of Tattersall [1982] and Rumpler [1990], the family Cheirogaleidae, prosimians of Madagascar, comprises five genera: *Phaner, Microcebus, Cheirogaleus, Mirza,* and *Allocebus*. Cytogenetic studies of the first four reveals that *Microcebus, Cheirogaleus,* and *Mirza* are characterized by the same karyotype (2N = 66) but that *Cheirogaleus* has a large amount of heterochromatin [Rumpler & Dutrillaux, 1979]. *Phaner,* on the other hand, displays a different karyotype (2N = 46) [Rumpler & Dutrillaux, 1979], and it was suggested that this species be classified in a separate subfamily: the Phanerinae [Rumpler & Rakotosamimanana, 1971]. The Cheirogaleidae will thus comprise two subfamilies: Cheirogaleinae and Phanerinae.

The only member of this family whose karyotype remains unknown is *Allocebus*. *Allocebus* was first described by Günther (1875) as *Cheirogaleus trichotis,* and only a few specimens were found [Hill, 1953] until Peyrieras discovered a new specimen named *Allocebus trichotis* by Petter–Rousseaux and Petter [1967]. No further specimens were captured until 1990, when B. Meier captured several specimens, of which two are still housed at the Parc Zoologique de Vincennes, Paris. This paper presents the karyotype of these animals.

MATERIALS AND METHODS

The subjects were one female and one male *Allocebus trichotis* kept in captivity. Cytogenetic investigation was conducted on both lymphocyte cultures and

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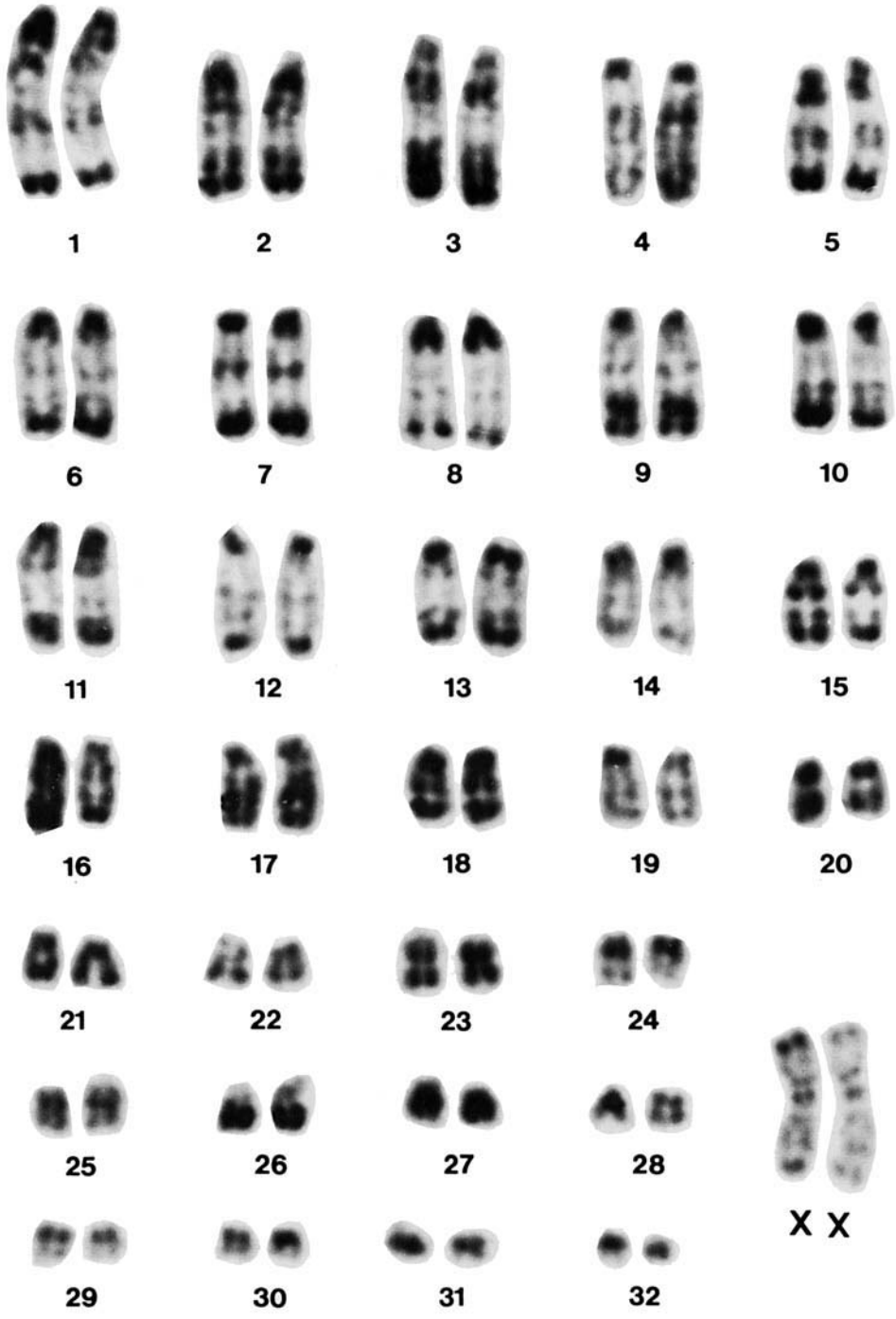

Fig. 1. R-banded karyotype of a female *Allocebus trichotis*.

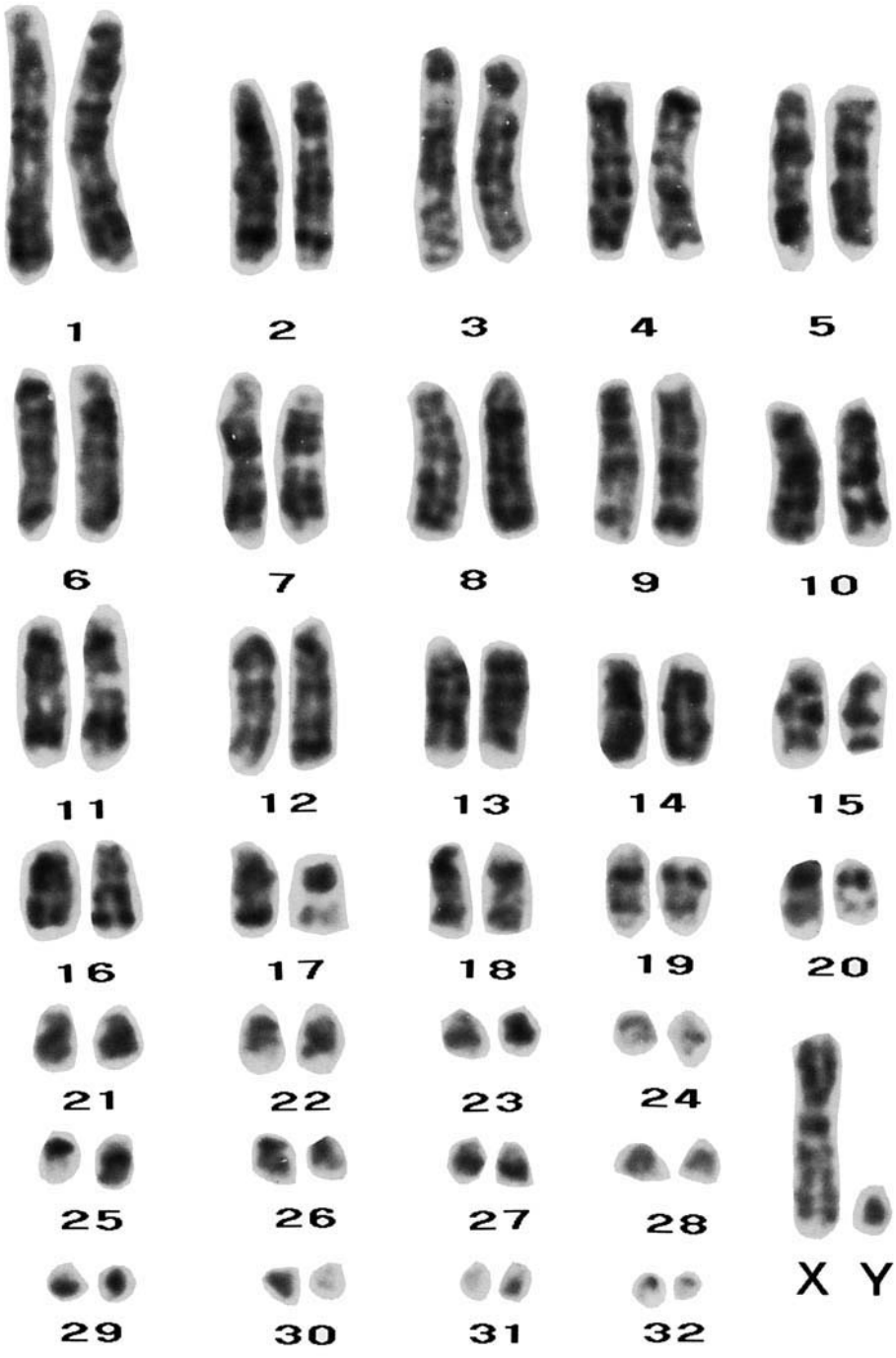

Fig. 2. G-banded karyotype of a male *Allocebus trichotis*.

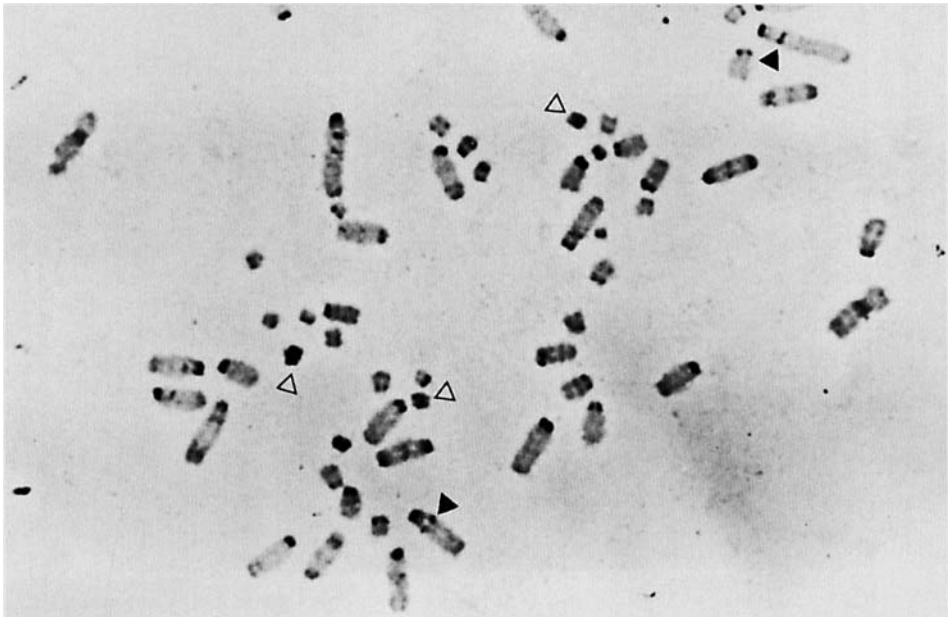

Fig. 3. Partial C-banded metaphase. Some microchromosomes are completely stained with C-bands (open arrowheads). On some chromosomes, heterochromatin blocks are also located elsewhere than on the juxtacentromeric region (solid arrowheads).

fibroblast cultures, derived from a skin biopsy done under general anaesthesia (ketamine chlorhydrate 0.100 mg). The karyotype was established after Q-banding [Casperson et al., 1970], R-banding [Dutrillaux & Lejeune, 1971], G-banding [Seabright, 1971], and C-banding [Sumner, 1972].

RESULTS AND DISCUSSION

The diploid number was determined on 54 metaphases. The karyotype (Figs. 1, 2) comprises 66 chromosomes, all acrocentric, except the X, which is metacentric. C-bands (Fig. 3) and Q-bands reveal no heterochromatic peculiarities save for some microchromosomes completely stained with C-bands or heterochromatic blocks located outside the juxtacentromeric region on some autosomes (Fig. 3). R-banding as well as Q- and G-banding allowed us to pair all the large and medium chromosomes with a high degree of certainty. Determination of the pairing of the small chromosomes remains uncertain (Figs. 1, 2, 4).

The comparative study of the karyotype of *A. trichotis* reveals no apparent differences from those of *Microcebus murinus, Cheirogaleus,* and *Mirza* (Fig. 4). The existence of such similar karyotypes for these four genera, except for the amount and the localization of heterochromatin, calls attention to the following:

1. The chromosomal evolution of the Cheirogaleinae differs from that of all other lemurs. In the other families, each species examined thus far is characterized by a specific karyotype resulting from chromosomal rearrangements which occurred in a predominant mode, called orthoselection by White [1978], and which is different for each family: Robertsonian translocations represent the major mode in the Lemuridae, termino-terminal fusions are the most frequent in the Lepilemuridae,

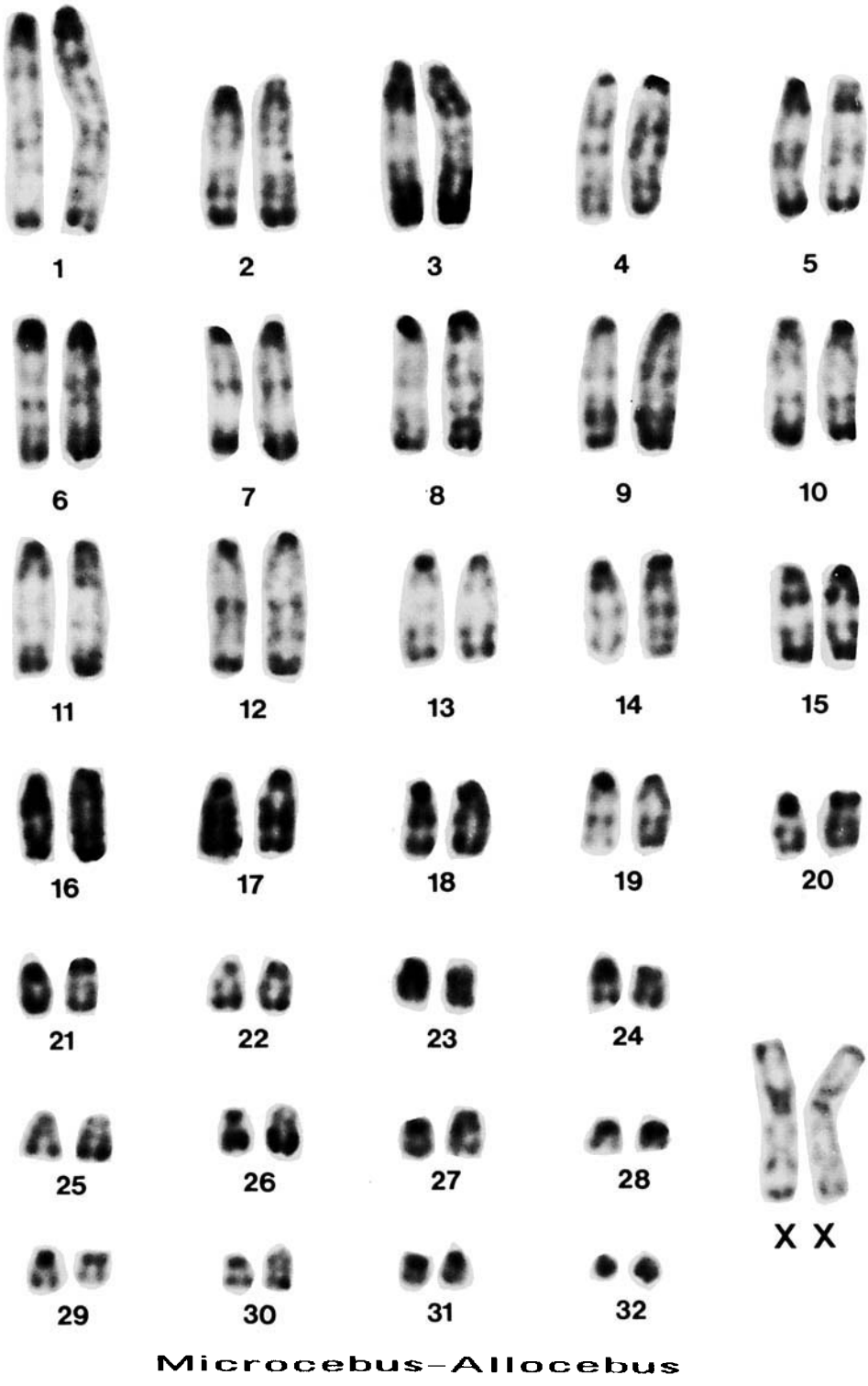

Fig. 4. Half R-banded karyotype of *Microcebus* (**left**) and *Allocebus* (**right**).

and pericentric inversions are frequent only in the Indriidae. Thus, only a small number of rearrangements characterize the subfamily Cheirogaleinae; none occurred in the hypothetical ancestral karyotype of all lemurs common to this group which thus remains very ancestral. Nevertheless, the genus *Phaner,* which also belongs to the same family, the Cheirogaleidae, showed the same mode of chromosomal evolution as the other lemur families.

2. Although chromosomal rearrangements played an important role during evolution of most species, the Cheirogaleinae illustrate a form of speciation that does not involve chromosomal rearrangement.

3. The last point is that, in this particular case, cytogenetics is unable to contribute towards establishing a phylogeny of the Cheirogaleinae, and, hence, the systematic position of *Allocebus* remains as controversial as ever in this subfamily, even if it appears closer to *Microcebus, Cheirogaleus,* and *Mirza* than *Phaner.*

CONCLUSIONS

1. The cytogenetic study of *Allocebus trichotis* reveals that its karyotype is similar to that of the other Cheirogaleinae, *Microcebus, Cheirogaleus,* and *Mirza.* This reinforces the peculiarity of this group, characterized by a speciation not involving chromosomal rearrangement.

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