

SHORT COMMUNICATION

A CHROMOSOME BANDING STUDY OF *Eumops glaucinus* (CHIROPTERA; MOLOSSIDAE)

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ABSTRACT

A cytogenetic study of *Eumops glaucinus* bats from southeastern Brazil showed that the species has $2n = 40$, $FN = 64$. G- and C-banding patterns and location of nucleolus organizer regions (NORs) are described.

INTRODUCTION

The present classification of the family Molossidae recognizes 12 recent genera including approximately 80 species (Koopman, 1984) that are widely distributed in the tropical and warm temperature regions of the world. The taxonomy and systematics of these species have received considerable attention (Freeman, 1981). However, many nominal taxa are still poorly represented in collections and currently accepted interpretations of phylogenetic relationships should be regarded as tentative.

About 30 molossid species have been recorded in the New World but for only 16 of them have the diploid numbers or standard karyotypes been analyzed (Patton and Baker, 1966; Wainberg, 1966; Baker, 1970; Baker and Lopes, 1970; Toledo, 1973;

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Wainberg *et al.*, 1974; Warner *et al.*, 1974; Gardner, 1977; Lopes, 1978). G-banding data have been published only for *Tadarida brasiliensis* (Baker *et al.*, 1982).

Because of the chromosome variation observed in the known standard karyotypes, G- and C-banded data are needed for molossid species in order to understand the patterns and evolutionary meaning of chromosome change and to better clarify the phylogenetic relationships.

The present paper reports the karyotype analyses of the species *Eumops glaucinus* by G- and C-banding and by Ag-NOR staining.

MATERIAL AND METHODS

The specimens (one male and one female) were found on the ground during the day and captured in urban areas of São José do Rio Preto, São Paulo, and are deposited in the chiroptera collection of the Department of Zoology, UNESP at São José do Rio Preto, São Paulo, Brazil (DZSJRP 15069, 15674).

Mitotic chromosome spreads of humeral marrow cells were prepared using yeast stimulation (Lee and Elder, 1980) and the colchicine, hypotonic potassium chloride, and air-drying technique described by Baker *et al.* (1982). G-banding was performed by the technique of Seabright (1971) modified by using 0.2% trypsin in isotonic saline for 5-20 seconds and staining with a 2% Giemsa-phosphate buffer solution for 5 minutes. C-banding was performed by the technique of Sumner (1972), modified by reducing the 0.1 molar HCl treatment to 20 minutes and by staining with 2% Giemsa-phosphate buffer for 20 minutes. The Ag-NOR staining procedure used was that of Howell and Black (1980), except that the slides were incubated for 5-8 minutes at 55°C. Chromosome pairs were subsequently numbered in decreasing order of size.

RESULTS

The karyotype of *Eumops glaucinus* has $2n = 40$, and $FN = 64$. It is composed of twelve pairs of metacentric or submetacentric chromosomes ranging in size from large to medium, one pair of small subtelocentrics and six pairs of medium to small acrocentrics. The X chromosome is a medium-sized submetacentric and the Y chromosome is an acrocentric.

Each chromosome pair is identifiable by a unique G-banding pattern (Figure 1A). Silver staining showed a number of active nucleolus organizer regions (NORs) ranging from three to six per metaphase and located on the short arms of the submetacentric pairs 7, 8 and 9 (Figure 1B).

Constitutive heterochromatin, as identified by the C-banding technique, appears in the centromeric regions of all chromosomes, in the short arm of pairs 7, 8, 9 and 10 and in the long arm of chromosome Y (Figure 1C).

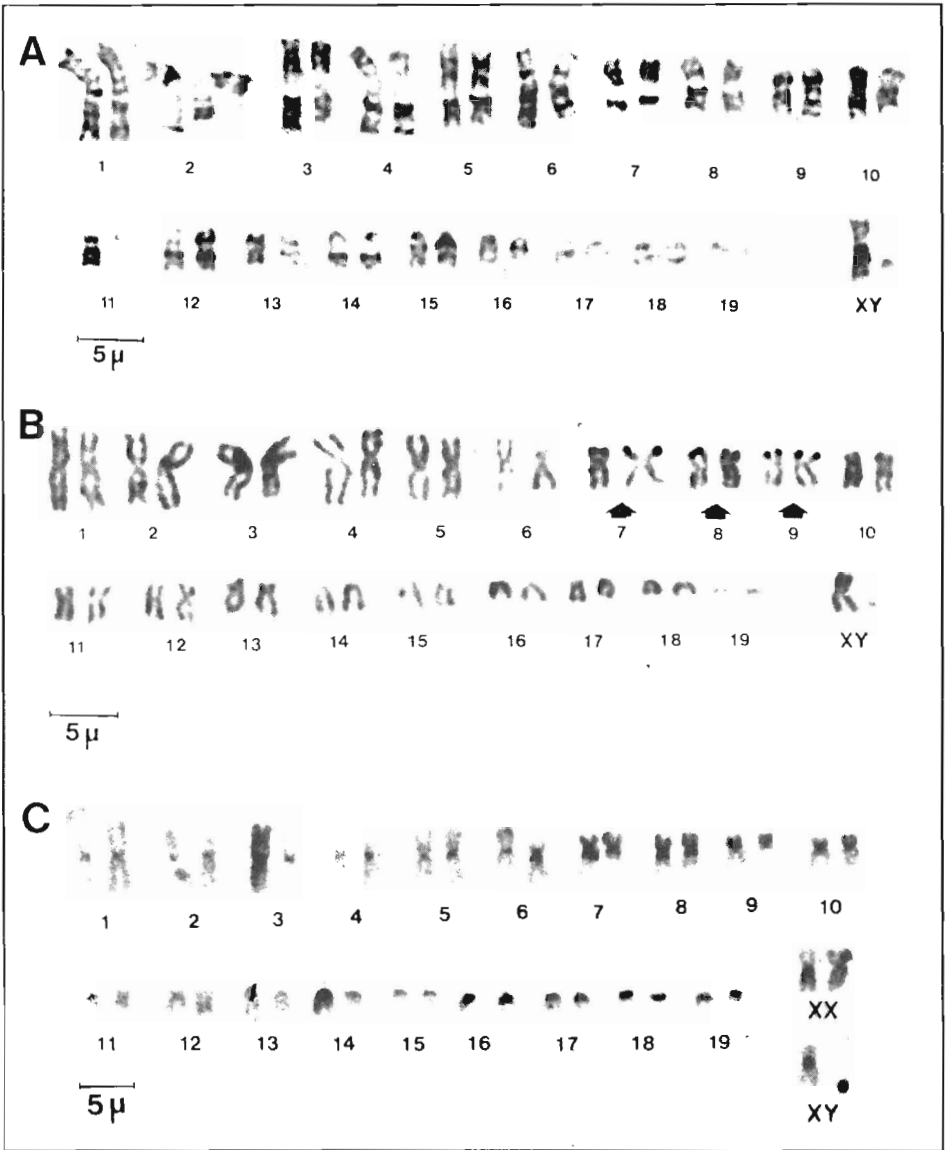


Figure 1 - Karyotype of *Eumops glaucinus* showing G-banding (A), Ag-NOR staining (B) and C-banding (C) patterns.

DISCUSSION

Although the lack of more complete and accurate karyotypic data on molossid

bats limits the understanding of the process of evolutive chromosome changes, the forms with a diploid number of 48 have been suggested as the primitive molossid karyotype (Warner *et al.*, 1974; Baker *et al.*, 1982).

The genus *Eumops* includes species with $2n = 48$, such as *E. underwoodi* (Warner *et al.*, 1974) and *E. perotis* (Baker, 1970), species with $2n = 42$, such as *E. auripendulus* (Warner *et al.*, 1974) and species with $2n = 38$ or 40 , such as *E. glaucinus* (Warner *et al.*, 1974; present specimens). Thus, this is a very interesting genus with ancestral and derived chromosome states.

The typical form of *E. glaucinus* is distributed from Central Mexico to Peru, Bolivia, Paraguay, southeastern Brazil, Jamaica and Cuba (Eger, 1977). Three different karyotypes were reported for this species by Warner *et al.* (1974). Specimens from Colombia have $2n = 40$ and $FN = 64$, and the autosomes have been described as one large pair of submetacentric, a series of 11 pairs of smaller submetacentrics gradually decreasing in size, one pair of small subtelocentrics and six pairs of medium to small acrocentrics. The X is a large metacentric and the Y is acrocentric. The other two karyotypes of this species have $2n = 38$ and $FN = 64$, but with geographic variation involving a medium-size pair of elements which appears to be acrocentric (in Mexico), submetacentric (in Costa Rica) or both (in Honduras). The Y chromosome appears as a very small metacentric. Warner *et al.* (1974) have suggested that the difference between the $2n = 40$ and $2n = 38$ karyotypes was the result of a centric fusion and the difference between the two $2n = 38$ variants was due to a pericentric inversion. The karyotype of the Brazilian specimens is very similar to that of Colombia.

For a better understanding of the evolutionary relationships in molossid bats correct chromosome homologies need to be detected, a fact that will only become possible when many more species are studied cytogenetically by G- and C-banding.

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RESUMO

Estudo citogenético em morcegos *Eumops glaucinus* provenientes do sudeste brasileiro mostrou que a espécie apresenta $2n = 40$, $NF = 64$. São descritos os padrões de bandas G e C e a localização das regiões organizadoras do nucléolo.

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