

## CHROMOSOMAL STUDY OF *LIOMYS PICTUS*

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### ABSTRACT

Somatic metaphase chromosomes were analyzed from bone marrow cells of *Liomys pictus*. A diploid number of 48 and a fundamental number of 66 was found for this species. No intralocality and/or interlocality chromosomal polymorphism was observed at localities with altitudes of sea level, approximately 3000 ft., and approximately 5000 ft.

### CHROMOSOMAL STUDY

Patton (1967), Hsu and Arrighi (1968), Stock (1974), Kilpatrick and Zimmerman (1975), and others have demonstrated that valuable information concerning mammalian taxonomy and evolution can be obtained from karyological studies. Such studies have involved animals of the genus *Perognathus*, *Peromyscus*, *Dipodomys*, and others. However, little information is available concerning the karyology of the spiny pocket mouse, *Liomys pictus*. Genoways (1973) indicated that *L. pictus* possessed a diploid number of 48; however, he examined only one specimen from each of three localities. The purpose of this study was to ascertain if any intralocality and/or interlocality chromosomal polymorphism existed in populations of *L. pictus* at three altitudes.

### MATERIALS AND METHODS

Specimens used in this study were collected using Sherman live traps in the Mexican state of Colima. Twenty-eight *L. pictus* were collected from the following localities: Playa de Oro (altitude sea level), 10; El Cobano (altitude approximately 3000 ft.), 11; an area 2.5 miles SE from San Antonio (altitude approximately 5000 ft.), 7. After examination, all animals used in this study were prepared as study specimens and housed in the Memphis State University Museum of Zoology.

Somatic metaphase chromosomes were prepared by the colchicinehypotonic citrate procedure of Patton (1967). A minimum of ten metaphase plates with the modal diploid number was examined for each specimen. Karyograms of the mitotic chromosomes were prepared for each specimen. Karyograms of the mitotic chromosomes were prepared from photomicrographs, with the chromosomes being classified according to the terminology of Patton (1967). The fundamental number was established on the basis of the number of major autosomal arms.

### RESULTS

All *L. pictus* examined had a modal diploid number of 48. The autosomal complement consisted of five pairs of submetacentric chromosomes, five pairs of medium to small metacentric chromosomes, and 13 pairs of acrocentric chromosomes, ranging from large to small (Figs. 1 and 2). The sex-determining mechanism was of the typical XX/XY type. The X-chromosome was a large metacentric and the Y-chromosome was a medium sided submetacentric. The fundamental number was 66. No intralocality and/or interlocality chromosomal polymorphism was found in any of the three populations.

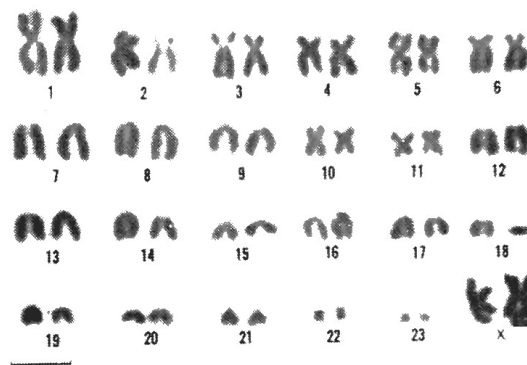


FIG. 1: Karyotype of *Liomys pictus*: female (the bar in the lower left is 5 microns long).

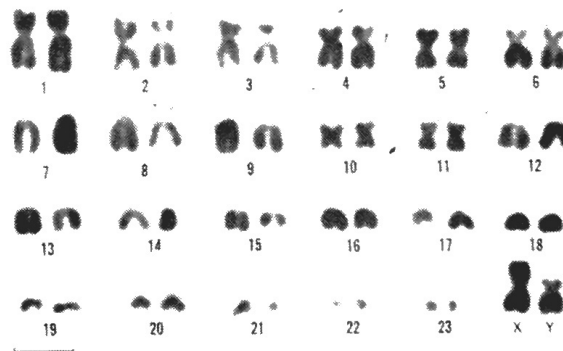


FIG. 2: Karyotype of *Liomys pictus*: male (the bar in the lower left is 5 microns long).

### DISCUSSION

Genoways (1973) has suggested that *L. irroratus* with 60 chromosomes possesses the most primitive karyotype among members of the genus *Liomys*. This view is consistent with the trend reported by Klinger (1963) and Hamerton et al. (1963) that a high diploid number and many acrocentric chromosomes are characteristic of a primitive mammalian karyotype. Karyological evolution in the genus *Liomys* appears to have involved a series of centric fusions and pericentric inversions whereby acrocentric chromosomes are converted to metacentric chromosomes (Genoways, 1973). Centric fusion is a common mechanism of chromosomal evolution in mammals (Chu and Swomley, 1961; Nadler, 1964) and results in a reduction in chromosome number without an appreciable reduction in the genetic