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CYTOGENETIC ANALYSIS OF *NEOTOMA MEXICANA TORQUATA*

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ABSTRACT

This work reports the cytogenetic analysis of *Neotoma mexicana torquata*, a subspecies restricted to the southern part of the Valley of Mexico. The complement shows a chromosome number 2n = 52 and a fundamental number FN = 52. The karyotype of this subspecies is near but little different from that showed by other populations of *Neotoma mexicana* reported previously. During meiosis at pachytene the homologue chromosomes form 26 bivalent rings. The sex-chromosomes shows a small terminal pairing segment forming an end to end X-Y complex.

RESUMEN

En este trabajo se presenta el análisis citogenético de la subespecie *Neotoma mexicana torquata*, restringida al sur del Valle de México. El complemento muestra un número cromosómico 2n = 52 y un número fundamental FN = 52. El cariotipo de esta subespecie es muy similar, aunque algo diferente, al encontrado en otras poblaciones de *Neotoma mexicana* previamente estudiadas. Durante las meiosis, en paquiteno, los cromosomas homólogos forman 26 anillos bivalentes. Los cromosomas sexuales muestran un pequeño segmento de apareamiento terminal formando un complejo X-Y.

INTRODUCTION

Karyotype analysis of the genus *Neotoma* has been already reported by Baker and Mascarello (1969) who studied, among other species of the genus, the chromosomes of *Neotoma mexicana* from some localities of Arizona, New Mexico and Colorado (USA) and from one locality of Durango (México).

Since *Neotoma mexicana* is a species widely distributed, it is important indeed to study also the different subspecies and populations of the group from the cytogenetic point of view.

The aim of this paper is to report observations concerning the karyotype and meiosis chromosome behaviour of *Neotoma mexicana torquata*, a subspecies restricted to the southern part of the Valley of Mexico (Hall and Kelson, 1959).

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MATERIAL AND METHODS

A total of 20 specimens (11 females and 9 males) of *Neotoma mexicana torquata* (*Cricetidae, Rodentia*) were trapped at the Botanical Garden of the Universidad Nacional Autónoma de México, located at the Pedregal de San Ángel, México, D. F.

The animals were injected with 0.1 ml/10 g body weight of a 0.04% colchicine solution and after 3 hours were sacrificed Chromosome spreads were obtained and permanent slides were prepared from bone marrow, spleen and testes following routine techniques (Beçak and Paulete, 1970; Ford and Evans, 1969). In each animal 20 metaphases from bone marrow and spleen were analyzed, to determine the relative length, arm ratio and centromeric index of each chromosome. All data were statistically analyzed according to Levan *et al.* (1964) and Al-Aish (1969) criteria.

TABLE 1

RELATIVE VALUES FOR IDENTIFICATION OF CHROMOSOMES OF NEOTOMA MEXICANA TORQUATA

	P	*Q*	*T.L.*	*R.L.*	*A.R.*	*C.I.*	*d*
1			29.66	6.80			
2			27.29	6.26			
3			26.37	6.05			
4			25.14	5.77			
5			23.92	5.49			
6			22.58	5.18			
7			20.54	4.71			
8			19.21	4.41			
9			17.25	3.96			
10			15.67	3.59			
11			14.91	3.42			
12			14.16	3.25			
13			13.91	3.19			
14			13.46	3.09			
15			12.87	2.95			
16			11.92	2.73			
17			11.87	2.72			
18			11.18	2.56			
19			10.94	2.51			
20			10.02	2.30			
21			9.58	2.20			
22			8.37	1.92			
23			7.83	1.80			
24			6.67	1.53			
25	4.12	8.66	12.79	2.93	2.10	32.21	3.55 sm
X	7.00	30.75	37.75	8.66	4.39	18.54	6.29 st
Y	6.15	8.88	15.03	3.45	1.44	40.92	1.80 m

Fig. 1. Karyotype of *Neotoma mexicana torquata*.

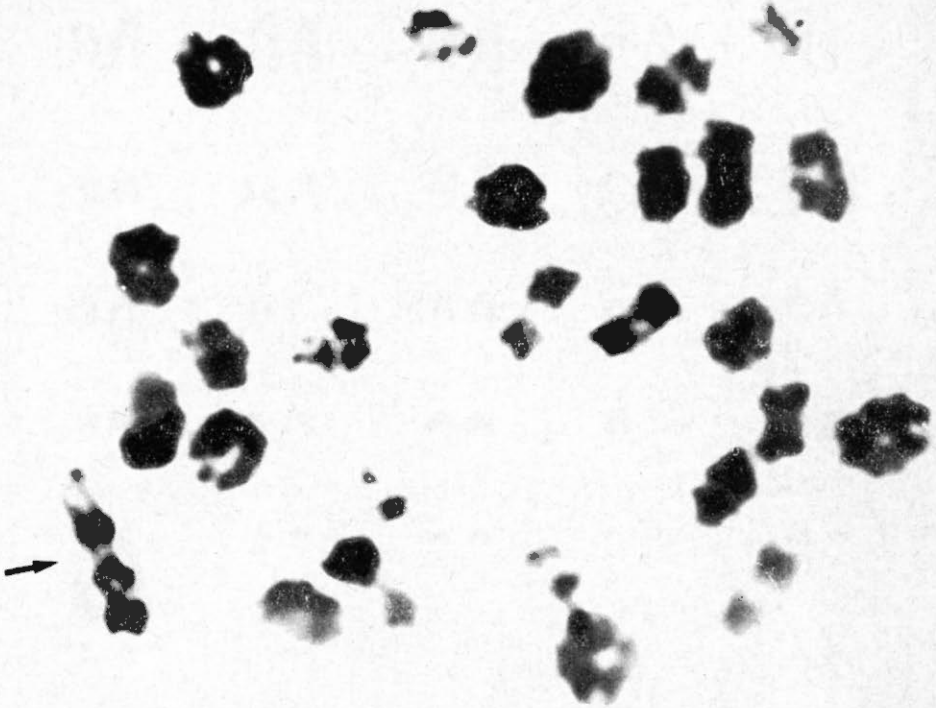

Fig. 2. Chromosomes of *Neotoma mexicana torquata* during meiosis at pachytene. The arrow points at the X-Y complex.

RESULTS

The chromosome number of the subspecies *Neotoma mexicana torquata* is 2n = 52, and the fundamental number is NF = 52 without differences among the specimens studied. The complement showed the existence of 25 pairs of autosomes; 24 out the 25 pairs of autosomes are acrocentric - in spite of several of them possess a knob-life short arm - and a pair of small submetacentric chromosomes. The X-chromosome is a subtelocentric one and is also the largest of the karyotype. The Y-chromosome is a medium sized metacentric one (Fig. 1).

During meiosis, at pachytene, homologues form 26 bivalent rings. The heterochromosomes show a small terminal pairing segment allowing them to form an end-to-end X-Y complex.

DISCUSSION

As previously reported by Paulete *et al.* (1971), the diploid number showed by *Neotoma mexicana torquata* (2n=52) agrees with this number which is also showed by six out of the seven species studied of the subgenus *Neotoma*, by Baker and Mascarello (1969). Equally, the fundamental number (NF = 52) is the same reported by the later authors.

The karyotype of *Neotoma mexicana torquata* from the Valley of Mexico mainly differs from all other populations of *Neotoma mexicana* located in other regions (from Arizona, New Me-

xico, Colorado and Durango) by its Y-chromosome which is metacentric in the former and subtelocentric in the later.

During meiosis at pachytene the homologues chromosomes form 26 bivalent rings. The sex-chromosomes shows a small terminal pairing segment forming and end to end X-Y complex.

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