Effects of Iso-PMS (100 mg/kg) on different stages of mouse spermatogenesis

Stage	Days after injection	Number ♀ tested	Corpora lutea	Dead implants	Live embryos	Early losses	Ratio live embryos/ corpora lutea	% dominant lethal mutations
Spermatozoa of vas and epididymes	1	15	144	25	111	8	0.77	13.85
	2	6	46	9	35	2	0.76	32.13
	4	14	127	47	74	6	0.58	38.42
	7	5	32	9	11	12	0.34	74.39
	Total	40	349	90	231	28	0.66	32.78
Control	Total 1–7	32	305	25	275	5	0.90	0
Post-meiotic stages	8	5	44	11	33	0	0.75	22.81
	11	4	39	11	26	2	0.66	23.98
	14	6	44	16	21	7	0.47	59.06
	15	8	68	19	49	0	0.72	28.30
	16	7	50	22	28	0	0.56	53.22
	19	7	59	24	35	10	0.59	41.52
	Total	37	304	103	182	19	0.59	39.30
Control	Total 7–14	31	300	33	265	2	0.88	0
Meiotic stages	24	8	87	17	61	9	0.70	12.40
	28	10	91	22	63	6	0.69	27.67
	29	3	31	9	17	5	0.54	34.91
	33	5	44	10	30	4	0.68	31.12
	35	1	10	0	8	2	0.80	8.16
	36	6	74	8	52	14	0.71	4.6
	37	2	16	1	12	3	0.75	31.11
	Total	35	353	67	243	43	0.69	20.32
Control	24–37	31	299	27	270	2	0.90	0

days). The pattern of IsoPMS effects are very different from other alkylating agents. The significant increase in early losses observed after treatment of spermatocytic stages could be imputed to a stronger disturbance of the meiotic processes which could result in gross chromosomal abnormalities in the gametes. This is also in agreement with previous data in the literature[7]. Further experiments are in progress designed to correlate the present findings with cytological effects, and to specify the sensitivity of each stage especially spermatogonia.

Résumé. Après avoir réalisé divers tests de toxicité, nous avons injecté des souris mâles par le méthane sulfonate d'isopropyl. Une dose de 100 mg/kg induit plus de 30% de mutations. Pour les stades méïotiques, la proportion de déciduomes est plus faible et la proportion de morts avant implantation plus élevée que pour les stades post-méïotiques. La période mutagène est suivie d'une période stérile (du 37me au 60me jour après injection) qui correspond probablement au traitement de stades spermatogoniaux.

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The Chromosomes of Two Species of the Genus *Oryzomys* (Rodentia-Cricetidae)

South American cricetids constitute a group characterized by a great variety of forms; according to PATTERSON and PASCUAL[1] this group appeared no later than the Upper Pliocene. Undoubtedly we are in the presence of a group of taxa in rapid evolution, with considerable radiation and many monotypical and specialized forms. *Oryzomys* is a primitive genus that contains the largest number of species described at present; according to CABRERA[2] there are 48 South American species of this genus in 7 subgenera. Endemic to this region and the south of North America, this genus is in need of a serious systematic revision, although it is evident that it is characterized by considerable intrageneric diversity.

As in all South American cricetids, very little is known about the chromosomes of this genus. BRUN[3] studied the species *Oryzomys flavescens* from the Republic of Uruguay and found a diploid number of 60 with a majority of acrocentric chromosomes. We studied *Oryzomys albigularis* and *Oryzomys delicatus* from Venezuela, 2 species which belong to the subgenus *Oryzomys* according to CABRERA[2]. TATE[4], however, places *O. delicatus* within the subgenus *Oligoryzomys*; the status of this subgenus is questioned by some authors.

We studied 3 females of the species *O. albigularis*, probably belonging to the subspecies *O. a. caracolus*[5]. These specimens are deposited in the Museo de Biologia of the Universidad Central de Venezuela with the

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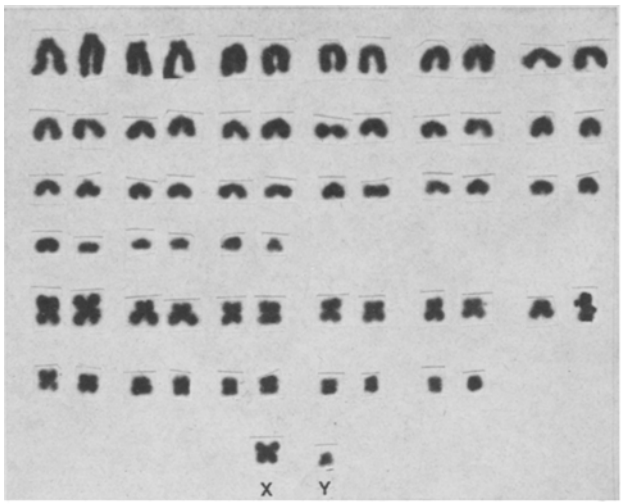

Fig. 1. Male karyotype of *Oryzomys albigularis*.

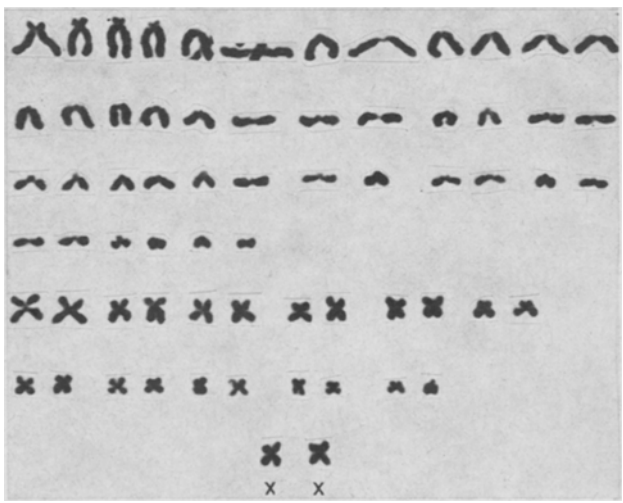

Fig. 2. Female karyotype of *Oryzomys albigularis*.

catalogue numbers MBUCV 1-1612, 1-1525, 1-1773. Two males of the same species were also studied (MBUCV 1-1652 and USNM 395256 of the Smithsonian Institute of the USA). All specimens were captured in Rancho Grande, Aragua. With respect to *O. delicatus*, 3 males were studied from the hills of Pipe, Miranda (MBUCV 1-1584, 1-1607 and USNM 395257). Both species were identified by O. A. Reig and confirmed by Ch. O. Handley jr. of the Smithsonian Institute. For the chromosome studies we followed the technique developed by Ford and Hamerton[6] with slight modifications, except in the case of the specimen MBUCV 1-1612 in which results were obtained using tissue cultures from ovary and lungs. Chromosome nomenclature follows Levan et al.[7].

A total of 70 metaphases analyzed from the species *O. albigularis* gave a chromosome number of 66 (Figures 1 and 2), with 21 pairs of subtelocentric and acrocentric autosomes of gently decreasing size and 11 pairs of submetacentric autosomes, also decreasing in size. The *X* is a metacentric medium-sized chromosome and the *Y* is a small submetacentric chromosome.

In *O. delicatus* a total of 34 metaphases studied gave a diploid number of 60 (Figure 3), with 3 pairs of relatively large submetacentric autosomes of decreasing size, 19

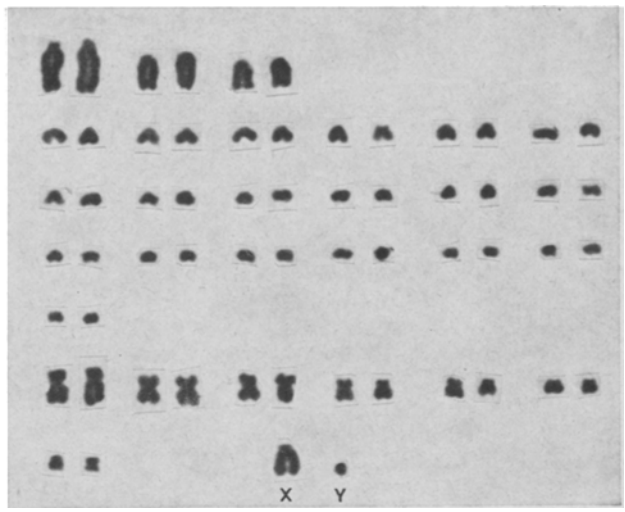

Fig. 3. Male karyotype of *Oryzomys delicatus*.

pairs of small subtelocentric or acrocentric autosomes barely decreasing in size. The remaining 7 pairs are submetacentric autosomes, also decreasing in size. The *X* is a subtelocentric chromosome of medium size and the *Y* is a small subtelocentric chromosome.

The chromosome feature of the 3 species of *Oryzomys* studied to date from localities as far as Venezuela and Uruguay, support the conclusion that this genus is characterized by a high number of chromosomes made up in large part by acrocentric or subtelocentric autosomes. In 1 male specimen of *O. minutus* (subgenus *Microryzomys*) from Apartaderos, Mérida, we observed a diploid number of 58 with the same general characteristics of the species previously described (the karyotype is still in process of study). This additional information tends to confirm the hypothesis raised above. It is still difficult and premature, however, to describe possible phylogenetic lines and mechanisms of chromosome evolution, even though the existence of the same chromosomes in the complements of the different species seem to occur. On the other hand, chromosome studies appear to be a useful tool for the systematic revision of this group.

Resumen. Oryzomys es un género altamente politípico y primitivo que ocupa un área geográfica que se extiende por todo el continente Sudamericano y el sur de Norteamérica. De este género se describen los cromosomas de dos especies pertenecientes al subgénero *Oryzomys*. *O. albigularis* (posiblemente *O. a. caracolus*) ($2N = 66$) y *O. delicatus* ($2N = 60$) cuyos cromosomas son fundamentalmente del tipo acrocéntrico o subtelocéntrico con algunos pares matacéntricos o submetacéntricos.

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[8] I thank O. A. Reig for encouragement and criticism. C. Sonnenschein for technical assistance in tissue cultures and E. Garcia for reading this paper. I also wish to thank Ch. O. Handley jr. for helping in the identification of the specimens.