tion. This indicated that there is compensatory hypertrophy of the contralateral testis. There is an increase in the average diameter of the testis and the seminiferous tubules as observed and measured in the sections. There is also a significant increase in the number of sperm bundles and cell nests per seminiferous tubule. There is an increase in the amount of interstitial cells (Table).

Though alternative hypotheses to explain the mechanisms of compensatory hypertrophy have been advanced, there is no doubt about the occurrence of compensatory hypertrophy of the contralateral ovary after unilateral ovariectomy in all vertebrates studied[1,3,4,6,9]. But as to its occurrence in the testis after unilateral castration, there is difference of opinion[7]. It is claimed that unilateral castration causes compensatory hypertrophy of the contralateral testis in young animals and not in mature males. Even this is described as accelerated growth and not compensatory hypertrophy[7]. Our studies show that there is 55.6% increase in the weight of the contralateral testis 10 days after unilateral castration (Table). It is statistically significant compared with the normal difference in weight between the right and left testis of the same animal (12.8). In addition to this increase in weight, there is also a significant increase in the diameter of testis, diameter of the individual seminiferous tubules, the number of sperm bundles and cell nests per seminiferous tubule and the number of interstitial cells in the intact testis (Table). All these facts indicate that there is an increase in the activity of the contralateral testis presumably under the influence of pituitary gonadotrophins[10].

Zusammenfassung. Nachweis kompensatorischen Wachstums des nach einseitiger Kastration verbleibenden Hodens bei indischer Krötenart (*Bufo melanostictus* (Schn)). Zunahme von Gewicht, Grösse und Spermienzahl.

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A Diploid Population of the Polyploid Amphibian *Odontophrynus americanus* and an Artificial Intraspecific Triploid Hybrid

Polyploidy has been well demonstrated in amphibians of the family Ceratophrydidae[1-4]. It has been demonstrated in other Anura too[5]. *Odontophrynus americanus* (Duméril and Bibron), 1882 was described as a tetraploid species. Somatic tissues and germ cells showed the same karyotype, with 44 chromosomes, arranged in 11 groups of homologues. Spermatocytes I formed mostly ring quadrivalents and metaphases II exhibited 22 dyads.

Comparative cytophotometric DNA measurements of Feulgen stained preparations as well as nuclear volume measurements of different tissues from the diploid species *Odontophrynus cultripes* ($2n = 22$), the tetraploid *O. americanus* ($4n = 44$) and the octoploid *Ceratophrys dorsata* ($8n = 104$) confirmed the expected 1:2:4 ratio[6].

In the State of São Paulo more than a hundred specimens of *O. americanus* collected between 45° W and 47° W meridians were karyotyped, confirming the tetraploid nature of that population. However, specimens collected in the surroundings of Botucatú, between the 48° W and 49° W meridians in the same State of São Paulo, are genetically different. Their karyotype, described in the present paper, has only 22 chromosomes and is characteristic of a diploid species.

Twenty-five specimens, comprising 21 males and 4 females, were analyzed. They were collected in the same area at a farm near the city of Botucatú. Compared with the tetraploid specimens they are apparently indistinguishable as to external characteristics and size (Figure 1).

The chromosomes for cytological study were obtained from spleen and gonads by the squash technique. Prior to sacrifice, the animals were treated for 2 h with a 0.5% solution of colchicine in the dosage of 0.2 ml/10 g body wt. The slides were stained with Giemsa, after hydrolysis in 1 *N* HCl at 60 °C for 10 min.

The karyotype consists of 22 chromosomes, sorted in 11 pairs of homologues. The pairs 1, 5, 6, 7, 10 and 11 consist of metacentrics; the pairs 2, 3, 8 and 9 consist of submetacentrics and the pair 4 of acrocentrics. Satellites

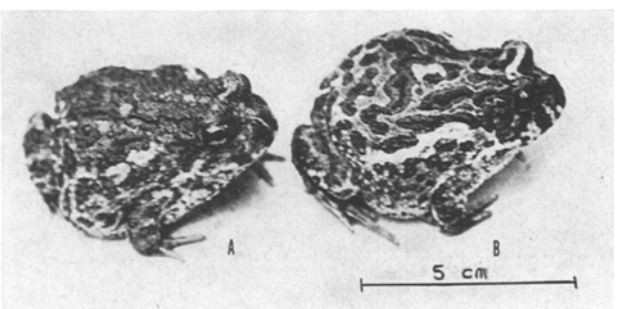

Fig. 1. *O. americanus*. (A) Tetraploid female ($4n = 44$). (B) Diploid female ($2n = 22$).

were evidenced in the chromosomes, of the pairs 4 and 11 (Figure 2). The karyotypes of both populations of *O. americanus* differ in this aspect; while the diploid specimens have satellites at 2 different pairs of chromosomes, the tetraploid specimens exhibited satellites only in the homologues of the 11th group. Heteromorphic chromosomes have not been observed in either sex.

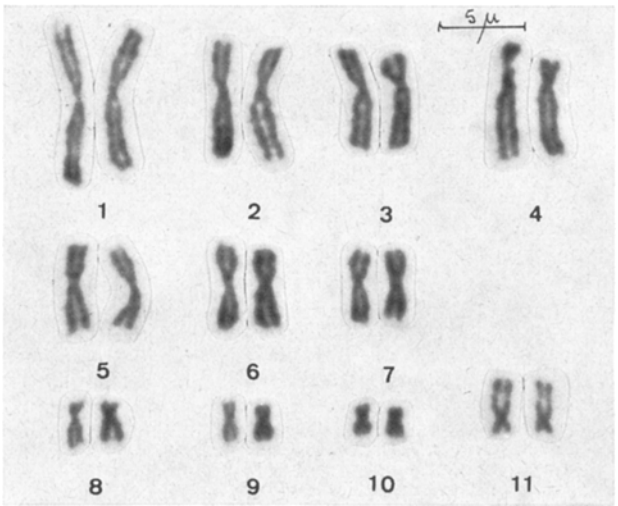

Fig. 2. Karyotype of the diploid *O. americanus* testis cell showing satellites at the 4th and 11th pairs of chromosomes.

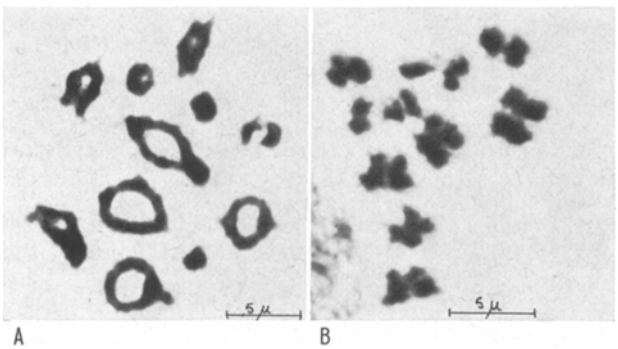

Fig. 3. *O. americanus* diploid male. (A) First meiotic metaphase showing 11 bivalents. (B) Second meiotic metaphase showing 11 dyads.

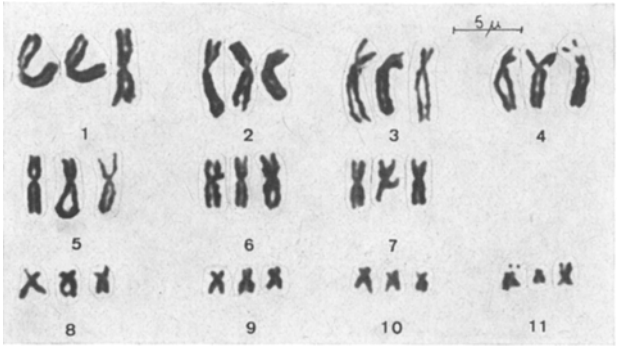

Fig. 4. Karyotype of an intraspecific triploid hybrid (*O. americanus* diploid ♂ × *O. americanus* tetraploid ♀) consisting of 11 groups of 3 chromosomes. Satellites are evident in one homologue of the 4th group and in the 11th group.

Meiotic analyses confirmed the diploid nature of the new population under study. Spermatocytes I showed 11 bivalents and in spermatocytes II, 11 dyads were counted (Figure 3).

Nuclear DNA values of Feulgen stained smears of blood erythrocytes from both populations of *O. americanus* were microphotometrically measured by a method already described[6]. A 1:2 ratio was found confirming the diploid and tetraploid nature of the west and east populations, respectively.

Artificial triploid hybrids by interspecific mating of the diploid *O. cultripes* ($2n = 22$) and the tetraploid *O. americanus* ($4n = 44$) were already described[7].

In this paper we describe intraspecific triploid hybrids obtained by crossing of natural diploid ($2n = 22$) and tetraploid ($4n = 44$) specimens of *O. americanus*. Mating was induced by s.c. inoculation in females of the macerated anterior pituitary lobe from *Bufo* specimens. Each female received the material from one animal. After 2 h the tetraploid female was gently squeezed at the abdomen, the ovules being laid over the minced testis of a diploid male, in a Petri dish containing tap-water. Tadpoles were sacrificed after 1 week and analyzed by the squash technique. All the cells analyzed proved to be triploid with $3n = 33$ chromosomes. In the karyotype the chromosomes were tentatively sorted in 11 groups of 3 chromosomes each (Figure 4).

An extensive survey of the area, where the diploid *O. americanus* population was found, is being conducted in order to determine its range and correlation with the tetraploid population. The results of this analysis will be described elsewhere[8].

Resumen. La ocurrencia de poliploidia ha sido relatada en anuros de la familia Ceratophrydidae incluyendo la especie tetraploide *O. americanus* ($4n = 44$). En una área geográfica distinta, sin embargo, fue observada una población diploide de *O. americanus* ($2n = 22$). Fueron obtenidos híbridos intraespecíficos triploides ($3n = 33$) por cruzamiento de ejemplares diploides y tetraploides de *O. americanus*.

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