also intervene actively in the metabolism of citric acid[12,13]. Accumulation of citric acid in kidneys and bones was observed after administration of parathormone or vitamin D. We have therefore examined in our experiments the concentration of citric acid and calcium in the kidneys and bones, but the experimental group showed no difference in comparison with the controls. Only the content of calcium in the kidneys was slightly diminished in the experimental group.

So it appears that after administration of TC the citric acid follows the serum calcium level and the quantity of ionized calcium very likely does not change, but no proof has been obtained that TC interfers with the metabolism of citric acid.

Zusammenfassung. Thyreocalcitonin, das neue Kalzium und Phosphor senkende Hormon, wurde auf seine Wirkung auf den Zitronensäuregehalt von Plasma, Nieren und Knochen untersucht. Dabei wurde eine Senkung der Zitronensäure im Plasma festgestellt, nicht aber eine solche in Knochen und Niere.

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Chromosome Morphology of Sceloporine Lizards (*Sceloporus occidentalis* and *S. graciosus*)

Cytogenetic techniques for the examination of somatic chromosomes of mammalian cells have recently been extended to reptilian studies. Because of these advances, it has been possible to obtain karyotypes of several representative reptiles to date. Some important points about the reptilian chromosomes have been described in these studies such as the evolutionary patterns of the order crocodilia[1] and sex chromosomes within the microchromosome portion of a karyotype[2]. In none of these studies has a nucleolus organizer region been described in a reptilian karyotype. Our recent studies of chromosomes from 2 lizard species indicate the consistent presence of satellited chromosomes within the karyotype. This report describes their appearance and behavior in our tissue cultured cells from *Sceloporus occidentalis* and *S. graciosus* collected from the Laguna mountains in Eastern San Diego County, California.

Myocardial tissue was minced and placed in milk dilution bottles in Eagles media supplemented with 2× extra amino acids and containing 20% fetal calf serum and penicillin and streptomycin. The cultures were incubated at 30 °C, and after several days the tissue pieces attached to the bottle, and cellular outgrowth began. After 2–3 weeks, the cells were removed from the glass surface with trypsin (0.25%) and transferred to new bottles. Thereafter, they are handled in the same manner as mammalian cell cultures with the exception of the incubation temperature. Chromosome preparations are generally made on the third day after passage when the cells are incubated with 0.2 μg/ml colcemid for 6 h and then harvested by trypsinization. The cells are treated with 0.075*M* KCl for 17 min, fixed in 3:1 ethanol-acetic acid, and air-dried on a glass slide. Some cultures have been maintained for over one year to date, and although their mitotic activity is low when compared to mammalian cell cultures, they have remained predominantly diploid.

The karyotypes of both species show 12 macrochromosomes in the several individuals of both sexes which were examined. The karyotypes are shown in Figure 1 and show *S. occidentalis* to have 12 macrochromosomes and 10 microchromosomes; whereas *S. graciosus* has 12 macrochromosomes and 18 microchromosomes. We were unable to see any difference between the 2 sexes in either species, confirming COLE et al.[3] in their report on *S. occidentalis*.

There are 2 principal observations of interest which can be made in the karyotypes of these 2 species. First, it is evident that both have similar macrochromosome morphology. In contrast to the arrangement of LOWE et al.[4], it seems more logical to arrange the largest 6 pairs of chromosomes from both species as macrochromosomal elements. In fact, a review of published karyotypes of other 'Sceloporine' species[2,5–7] show essentially identical macrochromosome morphology for representatives of the genuses Uta, Uma and Sceloporus. However, only LOWE's karyotype of *S. magister* shows satellited chromosomes in the complement. Our preparations from *S. graciosus* have consistently had satellites of the long arm of what we choose to call chromosome pair No. 2. The appearance of these satellites varies from preparation to preparation and spread to spread as is true for satellites in other animal (Figure 1a) karyotypes. Our first preparations from *S. occidentalis* showed no satellites (Figure 1b) but consistently demonstrated a high incidence of long-arm telomere association of pair No. 2 (Figure 2a, b). We believed that this phenomenon suggested the presence of non-visualized satellites or satellites in an altered morphological and functional state. Subsequent preparations from these serial cultures have confirmed this by demonstrating satellites on this chromosome pair (Figure 2c). Satellite presence is classically associated with nucleolar organizing function. The variable appearance probably corresponds to different functional states of the organizer. After seeing our satellited preparations, COHEN[8] reported

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that: 'Preparations from the iguanids *Iguana iguana* and *Crotaphytus collaris* made subsequent to the published karyotypes have also shown a satellited No. 2 pair.' This raises the possibility that this may be a consistent phenomenon in this family which will not be evident except under ideal tissue culture and preparative cytologic conditions.

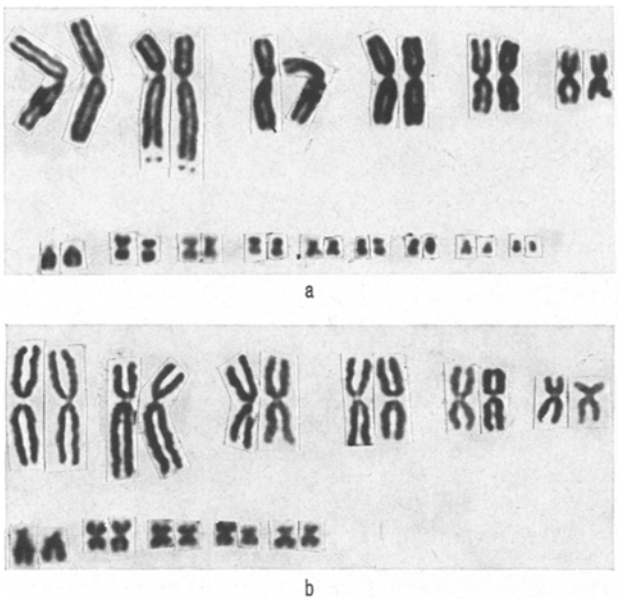

Fig. 1. (a) (top) Karyotype of *Sceloporus graciosus*. Note satellites at end of long arm of second macrochromosome pair. (b) (bottom) Karyotype of *Sceloporus occidentalis*.

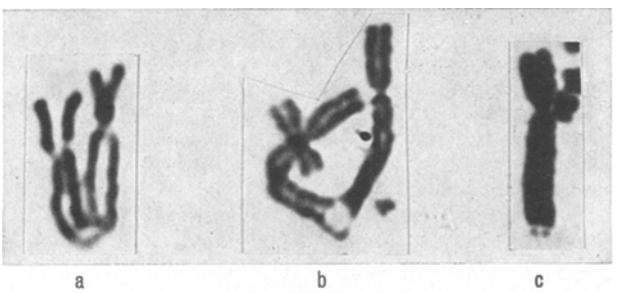

Fig. 2. (a) and (b) Long-arm telomeric association and 'bridging' of second macrochromosome pair of *S. occidentalis*. (c) Satellites of second macrochromosome pair of *S. occidentalis* appearing after multiple passages in tissue culture.

The second observations concern the microchromosome morphology and its probable importance in species differentiation and perhaps in speciation itself[5,6,9]. Our arrangement of microchromosomes for *S. occidentalis* and *S. graciosus* suggests that the 5 microchromosomal pairs in the former are very similar if not identical to the first 5 microchromosome pairs of the latter. A review of the *Uta* karyotypes of PENNOCK[2,7] suggest a similar identity for at least the first 4 pairs. Thus, it would seem that analysis of microchromosome number is not sufficient for critical interspecific comparison among the lizard karyotypes. Better preparative techniques reveal sufficient microchromosomal morphology for good comparative analysis of the larger pairs. Excellent preparations will enable one to see detail in all but the smallest pairs, even to visualization of apparently satellited microchromosomes. Another technique recently developed by SHAW[10] has demonstrated visible arm structure in the smallest microchromosomes of *S. graciosus*[11]. This promises to be helpful in the future analysis of interspecific microchromosomal differences and their meaning in karyotype evolution in the lizards. Lizard tissues are readily available and easily handled by standard tissue culture techniques and should be a valuable source of material for further studies of microchromosome behavior and function.

Résumé. Les chromosomes somatiques de deux Lézards représentatifs des sceloporins sont analysés. *S. graciosus* a 12 macrochromosomes et 18 microchromosomes, et *S. occidentalis* a 12 macrochromosomes et 10 microchromosomes. La morphologie des macrochromosomes de ces deux espèces est la même. La morphologie des microchromosomes offre des différences spécifiques importantes. Ce fait ainsi que d'autres constatations suggèrent que les changements observés dans les microchromosomes jouent probablement un rôle important dans l'évolution du karyotype des Lézards.

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The Chromosomes of *Marmosa fuscata* Thomas, from Northern Venezuela (Marsupialia, Didelphidae)

The karyotype of *Marmosa robinsoni* has been recently reported by REIG[1] as being very similar to that of *Caluromys derbianus*, described by BIGGERS et al.[2]. Both species share the same number of chromosomes ($2n = 14$) and the autosomes are quite similar in relative size and arm ratio the gonosomes are slightly different, though. *Marmosa mexicana* has also been found[2] to be very similar to *Caluromys derbianus* in the chromosome complement, but a description of its karyotype has not been presented.

The striking chromosome similarity found between fairly separate didelphid genera is noteworthy. *Marmosa* and *Caluromys* are members of different subfamilies of the Didelphidae[1,3], namely Didelphinae and Microbiotheriinae. Didelphids of the same subfamily as *Marmosa*,

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