Karyotypes of Two Rodents from Perú, with a Description of the Highest Diploid Number Recorded for a Mammal

Among the mammals collected in Perú while I was a member of the 1968 Louisiana State University Museum of Zoology expedition to that country is a subadult female *Anotomys leander* Thomas, LSUMZ 14436, and a subadult female *Agouti*[1] *taczanowskii* (Stolzmann), LSUMZ 14406, both trapped on the eastern slope of the Cordillera Carpish, Carretera Central, 2400 m, Depto. Huánuco, on 15. and 18. August, respectively. Dividing bone marrow cells were prepared for chromosomal analysis following a modification of the technique outlined by PATTON[2].

The diploid number of *Anotomys leander*, determined after the examination of more than 50 C-metaphase spreads, is 92 and the fundamental number (FN) is either 98 or 100. The chromosomes consist of 1 pair of large subtelocentrics, 3 pairs of medium-sized submetacentrics, 1 pair of medium-sized metacentrics, and 41 pairs of acrocentrics grading in size from medium to small (Figure 1). Since only a female has been analyzed, the sex chromosomes are not known, but I suspect that the *X*-chromosomes may be the largest biarmed pair, in which case the FN would be 98.

The diploid number of *Agouti taczanowskii* is 42 and the FN is 80. The chromosomes consist of 17 pairs of metacentrics and submetacentrics gradated in size from large to medium, and 4 pairs of medium-sized to small subtelocentrics (Figure 2). The sex chromosomes are not distinguishable inasmuch as only a female has been analyzed; however, in any case the FN is 80 since all autosomes are biarmed.

Anotomys is a monotypic genus of the amphibious 'fish eating' ichthyomyine rodents of the family Cricetidae. This specimen of *A. leander*, the first reported from Perú, extends the known range of the species over 1100 kilometers SSE from the type locality, Mt. Pichincha, 11,500 ft., near Quito, Ecuador[3]. *Anotomys leander* has the highest number of chromosomes known for a mammal. The highest mammalian diploid number previously reported was 84 chromosomes in the rhinoceros, *Diceros bicornis* Gray[4], whereas the highest number known for a rodent was 78 found in the pocket gopher, *Thomomys umbrinus* (Richardson)[5].

Agouti taczanowskii, the mountain paca, is a member of the Neotropical caviomorph rodent family Dasyproctidae. *Agouti paca* (Linnaeus), the only other species currently recognized in the genus, has a very different karyotype with a diploid number of 74[6]. All of the autosomes of *A. paca* are small and only the metacentric *X*-chromosome approaches the larger size characterizing most of the chromosomes of *A. taczanowskii*.

Agouti taczanowskii is found at higher elevations in Venezuela, Colombia, Ecuador, and Perú. There are few records of this large rodent from Perú and, apparently, the earliest is EATON's report[7] of skulls found in burial caves at Machu Picchu, Depto. Cuzco, which formed the basis for his description of *Agouti thomasi*[8]. When THOMAS[9] erected the genus *Stictomys* for the mountain

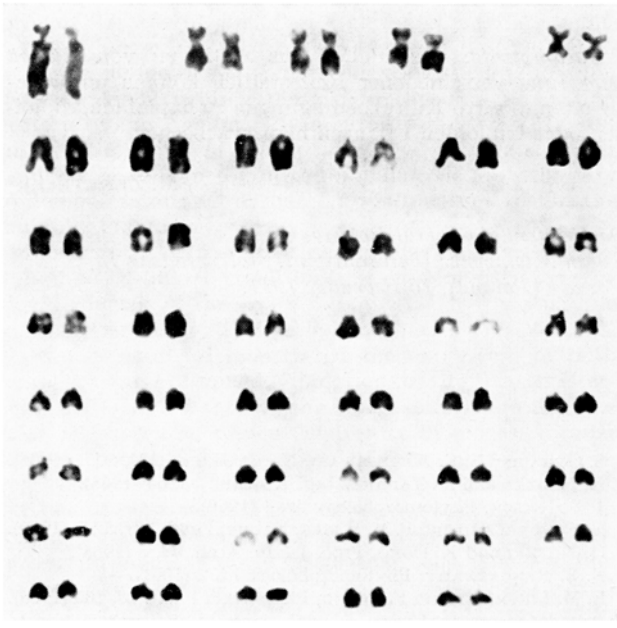

Fig. 1. Karyotype of a subadult female *Anotomys leander* from the Cordillera Carpish, 2400 m, Depto. Huánuco, Perú (LSUMZ 14436).

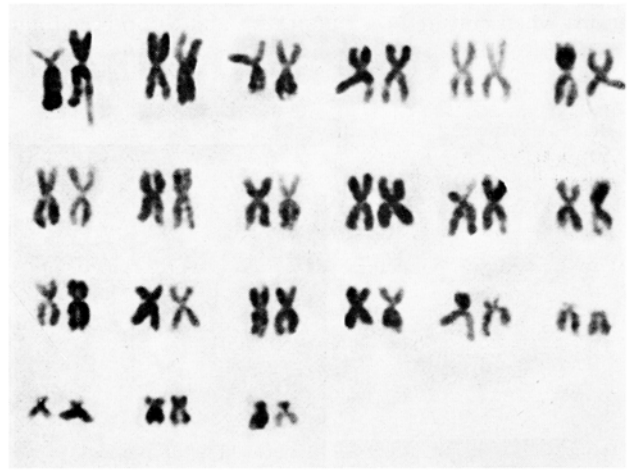

Fig. 2. Karyotype of a subadult female *Agouti taczanowskii* from the Cordillera Carpish, 2400 m, Depto. Huánuco, Perú (LSUMZ 14406).

[1] *Agouti* Lacépède, 1799, is usually treated as a synonym of *Cuniculus* BRISSON, 1762, with *Mus paca* Linnaeus, 1766, the type species by subsequent designation (HOLLISTER, Proc. Biol. Soc. Washington *26*, 79, 1913); however, BRISSON's names are non-Linnaen, therefore *Agouti* has priority.

[2] J. L. PATTON, J. Mammalogy *48*, 27 (1967).

[3] The Neotropical amphibious rodents are currently under revision by EMMET T. HOOPER of the Museum of Zoology, University of Michigan, and GUY G. MUSSER of the Department of Mammalogy, American Museum of Natural History.

[4] D. A. HUNGERFORD, H. SHARAT CHANDRA and R. L. SNYDER, Am. Naturalist *101*, 357 (1967).

[5] J. L. PATTON and R. E. DINGMAN, J. Mammalogy *49*, 1 (1968).

[6] K. FREDGA, Mammal. Chromosome Newsl. *20*, 45, Figs. 1–9 (1966).

[7] G. F. EATON, Mem. Conn. Acad. Arts Sci. *5*, 89, pl. 38 (1916).

[8] C. C. SANBORN, Publs. Mus. Hist. nat. 'Javier Prado', Lima, ser. A *12*, 1 (1953). Treated *thomasi* as a subspecies whose validity was not yet established.

[9] O. THOMAS, Ann. Mag. nat. Hist., ser. 9, *13*, 237 (1924).

pacas, he did not include Perú in the known range of *A. taczanowskii*, having assumed that the name *thomasi* referred to a form of the Peruvian lowland paca. Later, THOMAS[10] reported 3 specimens from Perú as *Coelogenys paca*: 2 skulls of immature animals from Acobamba, 8000 ft., Depto. Pasco[11], and the skull of a male 'secured from natives' from Chihuangala, 4000 ft., Depto. Huánuco. The 2 from Acobamba are almost certainly *A. taczanowskii*; however, the specimen from Chihuangala is probably *A. paca*. Unfortunately, the Cordillera Carpish *A. taczanowskii*, whose chromosomes are reported herein, is represented by a skin only. Three skulls of this species were secured from a hunter from the same locality (LSUMZ 14437, 14438, and 14439). The only other reference to specimens from Perú is SANBORN's[8] report of purchasing a piece of skin of the mountain paca in Sandia, Depto. Puno[12].

Resumen. Se describe los cariotipos de *Anotomys leander y Agouti taczanowskii* del Perú. Las cromosomas de *A. leander* son 92, el número más alto conocido de un mamífero. Informes anteriores de *A. taczanowskii* en el Perú son discutido.

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[10] O. THOMAS, Ann. Mag. nat. Hist., ser. 9, *20*, 594 (1927).

[11] Reported as Depto. Junín.

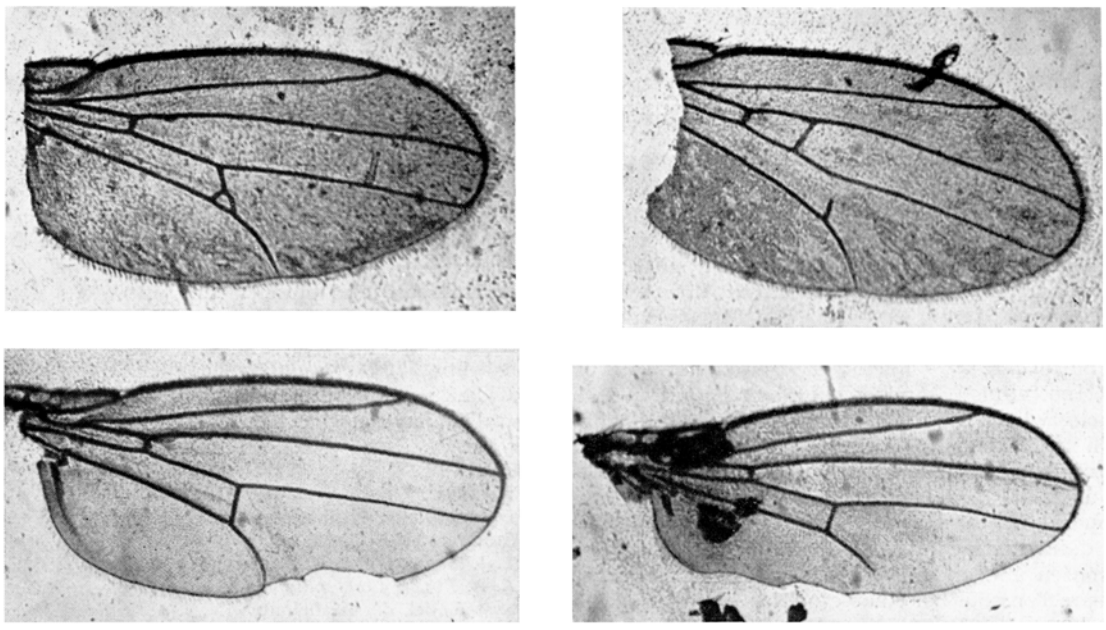
[12] The 1968 LSU Peruvian expedition was supported by JOHN S. MCILHENNY, Eugene du Pont III, and a Louisiana State University Graduate. Research Council grant to GEORGE H. LOWERY JR. I wish to thank JOHN P. O'NEILL of the Museum of Zoology, Louisiana State University, for assistance in the field, JAMES L. PATTON of the Museum of Vertebrate Zoology, University of California, Berkeley, for aid in preparing the karyotype of *Anotomys leander*, and GUY G. MUSSER of the Department of Mammalogy, American Museum of Natural History, for identifying the *Anotomys*. I also wish to thank MARY ANN GARDNER for preparation of the slides in the field.

On the Teratogenic Effect of Thymidine and its Suppression by Deoxycytidine in *Drosophila melanogaster*

In some of the earlier experiments[1,2] it was found that thymidine, when added to the food, has teratogenic and mutagenic effect in *D. melanogaster*. The most conspicuous of the teratogenic changes observed were the cuts on the wing margins (the number, size and potition of these varying, affecting one or both of the wings) and the abnormalities of the wing-veins (Figure). The other abnormalities were a) an increase in the number of scutellar bristles, b) irregularity of the abdominal bands and c) the malformation of the legs. The abnormalities were found to appear independently or in conjunction with others.

It has been reported by several authors that thymidine, at high concentrations inhibits the cell-growth in tissue-culture experiments and that this effect can be compensated by adding cytidine to the tissue medium[3–5]. It was thought that there might be a similar effect in *D. melanogaster* and the thymidine-action might be compensated in the same way as in tissue cultures.

The experiments described here were performed under exactly similar conditions as reported earlier[1]. In all of these experiments, grade A thymidine and deoxycytidine obtained from Calbiochem (Switzerland) were employed. The concentration of thymidine and deoxycytidine respectively were kept at 2%. To study the compensatory effect of deoxycydidine, equal amounts of thymidine and deoxycytidine were weighed separately, mixed together



Some of the typical abnormalities of the wings and the veins in *D. melanogaster*