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Determiniation of Taterillus (Rodentia, Gerbillidae) from Senegal by serum electrophoresis

B. Hubert and J. C. Baron

Office de la Recherche Scientifique et Technique Outre-Mer (ORSTOM), Dakar, Senegal

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The taxonomy of the genus *Taterillus* Thomas has always posed problems. Recently, Rosevear (1969) regrouped all Senegalese *Taterillus* in only one species: *Taterillus gracilis* Thomas 1892. Professor Matthey carried out a cytotaxonomic investigation on specimens collected in the field; there are at least two chromosomically distinct species: the first with 22 chromosomes for females and 23 for males (Fundamental Numbers 44 and 46, respectively) and the second with 36 and 37 chromosomes (FN = 46). Later on, cytotaxonomic investigations were carried out in Lausanne and Dakar on wild animals and their offspring reared in the laboratory. All individuals studied belong to one of these two groups. Although we never found other chromosomic numbers in nature, hybrids have been obtained with 30 chromosomes by interbreeding the two species (either by mating a male with 23 chromosomes with a female with 36 chromosomes or the reciprocal cross).

According to a recent proposal of nomenclature (Petter et al., 1972), the individuals with 36/37 chromosomes are called *Taterillus gracilis* Thomas and the others with 22/23 chromosomes *Taterillus pygargus* Cuvier. These two species, sympatric on the main part of the Senegalese territory (*T. gracilis* should be more Soudanian and *T. pygargus* more Sahelian), are indistinguishable by usual tests (colour of the coat, body and cranial measurements and morphology). Determination by chromosomic analysis requires the sacrifice of the animal, prohibiting any ecological work with capture-recapture and marking methods. Therefore a method has been developed which permits the identification of an animal without killing by carrying out a serum electrophoretic analysis with blood obtained by a cardiac puncture.

The search in serum esterases for isoenzymes which can be used as genetic markers appears intricate (cf. Baron, 1973). But the electrophoretic analysis of the whole serum permits an easy differentiation of the species since the migration of the albumin fraction is slower in individuals with 22/23 chromosomes than in those with 36/37. (Fig. 1A and 1B). Hybrids have an electrophoretic pattern showing two bands for the albuminic fraction while the parents are characterized by only one band (Fig. 1B).

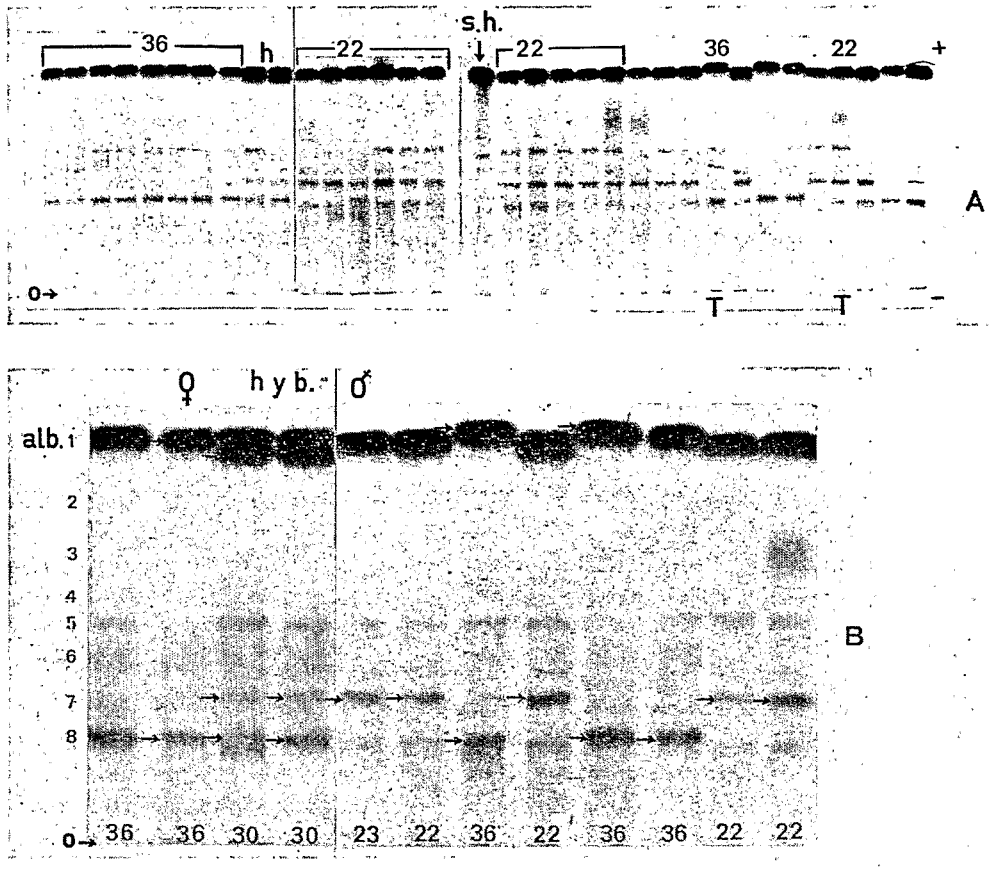

Fig. 1. Electrophoretograms of *Taterillus* sera after horizontal gel electrophoresis (concentration 12%) with a voltage gradient of 4.5 V/cm applied for 6½ h at room temperature. Discontinuous buffer: electrode buffer 25 m*M* LiOH and 100 m*M* borate, pH 8.4; gel buffer 50 m*M* tris and 8 m*M* citrate, pH 8.2. Coloration: amido black 10 B.

A. Electrophoregrams of 33 *Taterillus* sera; 36 indicates *T. gracilis* (36/37 chromosomes) and 22 indicates *T. pygargus* (22/23 chromosomes); h = hybrids; s.h. = human serum; O = origin of the migration; T = check samples among unknown sera.

B (left). Comparison between the sera of parents (♀ = female with 36 chromosomes; ♂ = male with 23 chromosomes) and the sera of their progeny F_1 (hybrids with 30 chromosomes).

B (right). Comparison between the sera of *T. gracilis* (fast albumin) and *T. pygargus* (slow albumin).

Further an important fraction migrates more rapidly (No 7) in animals with 22/23 chromosomes than in animals with 36/37 (No 8). In hybrids two fractions are present (No 7 and No 8).

For routine work we used an indirect method which consisted of mixing the serum of an unknown animal (X) with the serum of a known animal (A) (for instance 22/23 chromosomes) before the electrophoretic migration. If we find only one albuminic fraction, X and A belong to the same species (22/23 chromosomes). If we find

two bands, X belongs to the other species (36/37 chromosomes). Determination of the species by serum electrophoresis on cellulose acetate and localization of the transferrin by autoradiography will be studied very soon.

References

Baron, J. C., 1973. Simultaneous electrophoretic analysis of a large number of samples. Application to serum esterases. *Anim. Blood Grps biochem. Genet.* 4: 49–50.

Leone, C. A., 1964. Taxonomic biochemistry and serology. Ronald Press, New York,

Matthey, R., 1969. Chromosomes des Gerbillinae. Genres *Tatera* et *Taterillus*. *Mammalia* 33: 522–528.

Matthey, R. & F. Petter, 1970. Etude cytogénétique et taxonomique de 40 *Tatera* et *Taterillus* provenant de Haute Volta et de la République Centrafricaine (Rongeurs, Gerbillidae). *Mammalia* 34: 585–597.

Matthey, R. & M. Jotterand, 1972. L'analyse du caryotype permet de reconnaître deux espèces cryptiques confondues sous le nom de *Taterillus gracilis* Thomas (Rongeurs-Gerbillidae). *Mammalia* 36.

Nadler, C. F., R. S. Hoffman & J. J. Pizzimenti, 1971. Chromosomes and serum proteins of prairie dogs and a model of *Cynomys* evolutions. *J. Mamm.* 52: 545–555.

Petter, F., 1971. Nouvelles méthodes en systématique des mammifères. Cytotaxonomie et élevage. *Mammalia* 35: 331–369.

Petter, F., A. R. Poulet, B. Hubert & F. Adam, 1972. Contribution à l'étude des *Taterillus* du Sénegal, *T. pygargus* (F. Cuvier 1832) et *T. gracilis* (Thomas 1892) (Rongeurs, Gerbillidés). *Mammalia* 36.

Rosevear, D. R., 1969. The rodents of West Africa. British Museum, London, pp. 604.