The karyotype of *Crocidura flavescens* (Mammalia, Insectivora) in South Africa

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Abstract

Karyological results give evidence that the South African *Crocidura flavescens* (Geoffroy, 1827) is not conspecific with the West and East African giant shrews of the taxa *spurrelli, manni, kivu* and *olivieri.*

Introduction

The African giant shrews are characterized by a high variability in body size. The smallest form, *Crocidura flavescens* (Geoffroy), weighing about 20 g, is found in South Africa. The biggest, *Crocidura manni* Peters of 50 to 100 g, lives in the drainage-basin of the Niger. The giant shrews have been the subject of many taxonomic studies describing local morphotypes, sometimes as good species, and sometimes as subspecies associated with a species of a neighbouring geographic region. The difficulty of delimiting and defining these taxonomic units on a morphological basis and the absence of evident sympatric forms lead Heim de Balsac and Barloy (1966) to consider all these taxa as conspecific. They regroup them under the oldest available name *C. flavescens* (Geoffroy, 1827).

This interpretation has been followed by the authors of the most recent taxonomic syntheses, e.g. Heim de Balsac and Meester (1977), Corbet (1978), Corbet and Hill (1980) and Hutterer et al. (1982). However, a verification of this interpretation by another method than skull biometry is absolutely necessary. As a first approach, classic cytotaxonomy seems to provide such a control. In fact, the list of Reumer and Meylan (in press) shows that in the genus *Crocidura* the karyotype often permits good discrimination between species.

The karyotypes of four forms of the African giant shrew have been studied: *kivu* Osgood, 1910 of Zaire by Meylan (1967); *spurrelli* Thomas, 1910 of Ivory Coast by Meylan (1971) and Meylan and Vogel (1982); *olivieri* (Lesson, 1827) of Egypt by De Hondt (1974); and *manni* Peters, 1878 of Mali, Cameroun and Nigeria by Meylan and Vogel (1982). These forms share a common karyotype of 2 n = 50, NF = 66 and NFa = 62. This suggests that these four forms belong to the same species. However, it is now crucial to investigate the karyotype of the nominate form from South Africa; i.e., *flavescens* (Geoffroy, 1827), in order to test the interpretation of Heim de Balsac and Barloy (1966).

Material and methods

We analysed 7 specimens of *flavescens.* They were captured in the vicinity of Durban (Table 1). The chromosomes were prepared following a modified spread procedure in the laboratory of Prof. J.

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Table 1

Origin of the seven *C. flavescens* analysed

The material is conserved at the Institut de Zoologie et d'Ecologie Animale, Lausanne, Switzerland

No collection	sex	date	Locality in South Africa
IZEAL 2567	F	8. 10. 1981	Campus University, Durban
IZEAL 2568	M	1. 10. 1981	Stainbank Nature Reserve
IZEAL 2569	M	22. 10. 1981	Stainbank Nature Reserve
IZEAL 2346	F	5. 3. 1986	Pigeon Valley, Durban
IZEAL 2347	M	6. 3. 1986	Pigeon Valley, Durban
IZEAL 2348	F	6. 3. 1986	Pigeon Valley, Durban
IZEAL 2349	M	6. 3. 1986	Pigeon Valley, Durban

Meester in Durban. Slides were stained with Giemsa and analysed in Lausanne, where they could be compared with chromosome preparations of *spurrelli* of a laboratory colony, from Ivory Coast.

Results

The karyotype of the South African *C. flavescens* analysed (Fig. 1a, b) is 2n = 50. It is characterized by 4 small pairs of metacentric chromosomes, 7 pairs of submetacentric/subtelocentric and 13 pairs of acrocentric chromosomes. The X is submetacentric, the Y is acrocentric, therefore NF = 74 and NFa = 70.

In the West African *spurrelli* (Fig. 1c) the diploid number is also 2n = 50, but the karyotype is distinguished by 17 acrocentric pairs as described by Meylan and Vogel (1982) resulting in NF = 66 and a NFa = 62.

Discussion

The results reveal that *C. flavescens* from South Africa is characterized by a distinct karyotype which differs from that shared by the taxa *kivu, spurrelli, olivieri,* and *manni.* The important morphological differences, which cannot be explained by Robertsonian processes, seem to exclude the possibility of intraspecific polymorphism. We conclude, therefore, that the South African species *C. flavescens* (Geoffroy, 1827) is not identical with the West and East African forms which should be regrouped under another specific name.

Meylan and Vogel (1982) tentatively regrouped the forms *kivu, spurrelli, olivieri* and *manni* under the name *C. occidentalis* (Pucheran, 1855) partially on the basis of the old interpretation of Allen (1939). If ever East and West African giant shrews are really conspecific, the name *Crocidura olivieri* (Lesson, 1827) would have priority, all the more since Corbet (1978) has designated a neotype in order to end the discussion on the validity of this name arising from the work of Heim de Balsac and Barloy (1966). However, a common karyotype does not definitively prove conspecific unity of these forms. Let us remember that *C. giffardi* de Winton, 1898, of West Africa has a karyotype which is identical with that of our four forms (Meyland and Vogel 1982), while Heim de Balsac (1970) regarded this taxon as a separate species, but conspecific with *C. odorata* (Leconte, 1857).

In conclusion, other techniques are necessary to unravel the taxonomic status of West, East and Central African forms of the giant shrews. An electrophoretic study of allozymes may help to clarify the phyletic relationship between these forms. This technique has already proved valuable in an investigation of European shrews of the genus *Crocidura*

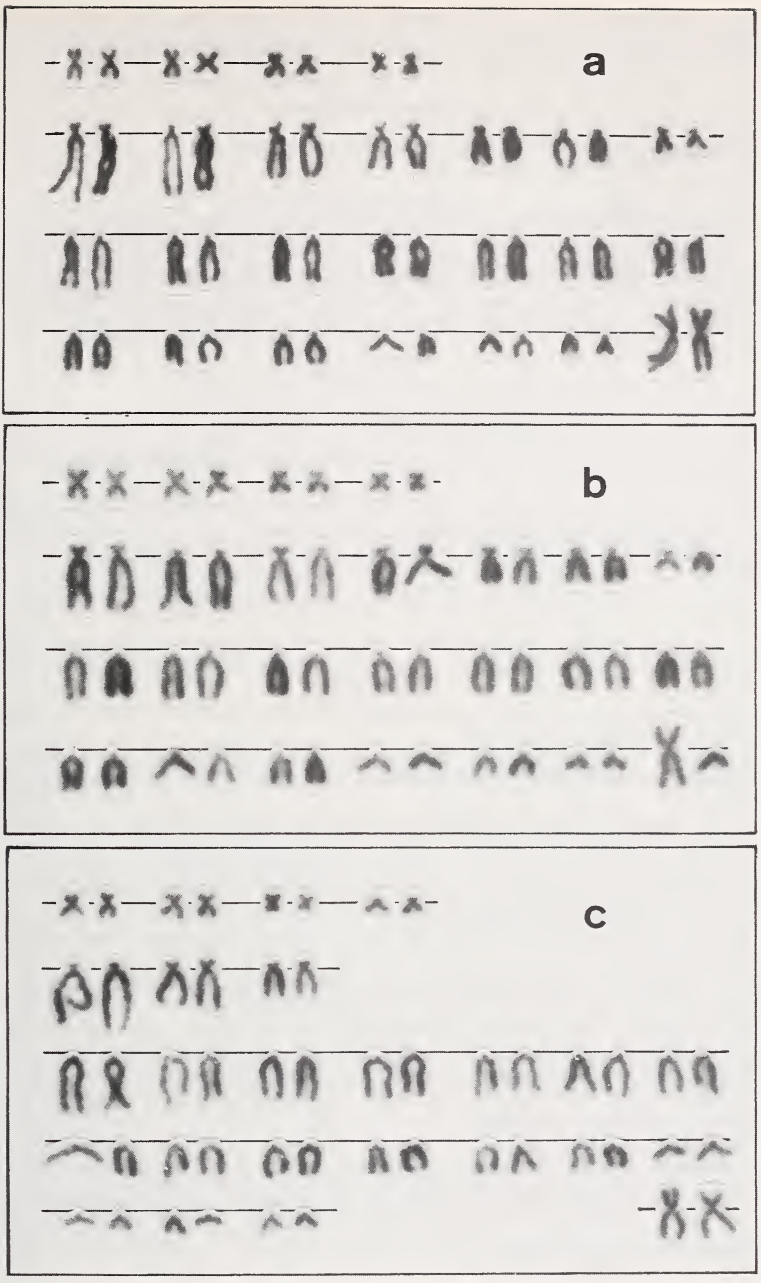

Fig. 1. Karyotypes of *Crocidura flavescens* from South Africa and the form *spurrelli* from Ivory Coast. a: female no. IZEAL 2346 of Durban; b: male no. IZEAL 2349 of Durban, both with 2n = 50 and 13 acrocentric pairs; c: female no. IZEAL 2407 from Ivory Coast with 2n = 50 and 17 acrocentric pairs

(Catzeflis et al. 1985; Vogel et al. 1986). A preliminary application of these methods to African shrews has also revealed promising results (Maddalena in preparation).

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Zusammenfassung

Der Karyotyp von Crocidura flavescens (Mammalia, Insectivora) in Südafrika

Der Karyotyp der südafrikanischen Riesenspitzmaus *Crocidura flavescens* (Geoffroy, 1827) unterscheidet sich von jenem der west- und ostafrikanischen Riesenspitzmäuse der Taxa *spurrelli, manni, kivu* und *olivieri.* Letztere müssen deshalb einer anderen Art zugeordnet werden.

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