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A NOTE ON THE IDENTIFICATION OF A NIGERIAN CHIMPANZEE AT ROME ZOO

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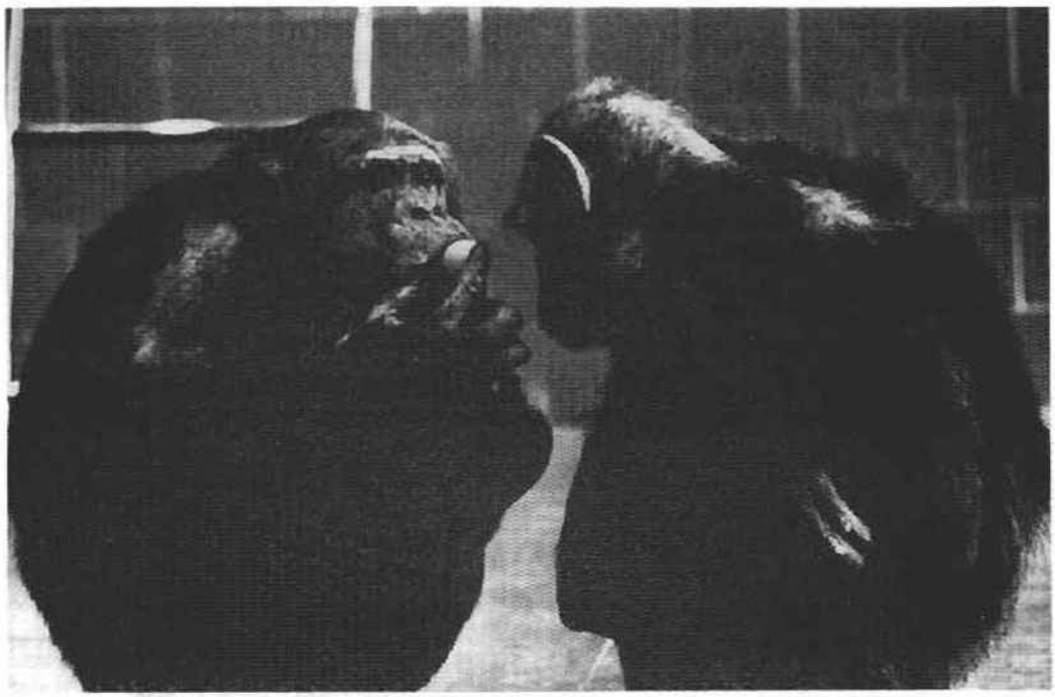
In this journal, Cousins (2006) recently discussed the history of *Pan troglodytes* taxonomy. The present captive chimpanzee population is of mixed or unknown origin, and thus of little significance for conservation programmes (Deinard and Kidd, 2000). In the last decade, genetic data have become available that allow some firm conclusions to be reached concerning population subdivisions in the species. Data from mtDNA (Morin *et al.*, 1994) support the validity of the three taxa recognised by the classical review of Schwarz (1934). The only major departure was later provided by Gonder *et al.* (1997), who on genetic grounds identified a further subspecies, *P. t. vellerosus* (Gray, 1862), from Nigeria (east of the river Niger) and north-west Cameroon (north of the river Sanaga).

The two western subspecies (*verus* and *vellerosus*) are considered the most seriously threatened owing to ongoing deforestation and hunting in the region. Specifically, *vellerosus*, with an estimated population of 8,000 individuals, is probably the only seriously threatened chimpanzee taxon (Oates, 2006). In a recent paper, Gonder *et al.* (2006) found that between the so-called Dahomey Gap and the Niger there occurs another distinct population, whose taxonomic status is unclear at the moment and which is now reduced to a very low population level.

The recent developments in molecular research have led many taxonomists to overlook records of morphological variations among chimpanzee populations. My attention has long been drawn to a morphologically distinctive male chimpanzee (house name 'Full') who lived at Rome Zoological Garden from 1964 to 2000. Regrettably, the body remains of this animal have been destroyed. However, Full had been previously sampled for a genetic study on paternity in chimpanzees (Pascali *et al.*, 1994). This allowed us to examine his mtDNA to verify to which subspecies he belonged, together with that of two other chimpanzee samples taken at random. The results showed that Full belonged to *Pan troglodytes vellerosus*, while the other two samples belonged to *P. t. troglodytes* (Batini *et al.*, 2007).

Discussion

Despite more than a century of discussion, the identification of *Pan troglodytes* subspecies by external morphological traits still appears to be unreliable. To some extent this is surprising, considering the considerable overlap between the classical taxonomy proposed by Schwarz (1934) and those developed through recent genetic researches (Morin *et al.*, 1994; Gonder *et al.*, 1997). Hill (1969), while explaining some of the difficulties associated with the study of live chimpanzees of unknown geographic origin for taxonomic purposes, recognised *P.*



Nigerian chimpanzee Full (left) with the 'bald' female Bonny (right) belonging to Pan troglodytes troglodytes. *Note the smaller size of the male.*

t. koolokamba (Du Chaillu, 1860), a form not confirmed by genetic investigations (Deinard and Kidd, 2000). It is unfortunate that historically a lot of attention has been devoted to races of dubious validity such as the koolookamba or, more recently, the Bili giant chimp, while much less effort has been spent in documenting geographic variation in captive individuals of known origin. It is of interest to note that the argument that it is difficult or impossible to distinguish subspecies on the basis of morphological characteristics has been used to support the hypothesis, based on nuclear DNA sequencing, that the origin of the various subspecies, and the divergence of *Pan paniscus*, is much more recent than mtDNA data suggest (Kaessmann *et al.*, 1999). More recently, it has been strongly advocated that nuclear data do not support the validity of chimpanzee subspecies (Fischer *et al.*, 2006).

In the present case, however, Full showed a number of physical characters that clearly differentiated him from other chimpanzees. Some of these external characters were the same as are shown in a figure in Oates *et al.* (2003, p. 124), i.e. small ears that remain inconspicuous under the hair, while the head appears shorter and broader and the supraorbital ridges are only slightly developed. Further, his body size was really modest for a male (see photo, above), but the effect of captivity on this aspect (as indeed on other physical characteristics) remains unknown. However, Liza Gadsby (pers. comm.) has confirmed that rescued *vellerosus* chimpanzees in Nigeria appear to be of smaller size and more slender build than those of other subspecies. Cousins (2006) has recently furnished in this journal the only available physical description of *vellerosus*, dating back to Rothschild (1904). It includes, among the other characters, small ears (50 by 45 mm), very long arms and a very long and thick beard. The canines

are very large, the facial portion of the skull very short and the lower molars very small. It is of interest that before the genetic analysis I was more inclined to associate Full with eastern chimpanzees than with *verus*, the latter subspecies being represented at the same zoo by a very large male, Giorgio (see photo, below).

As stressed recently by Groves (2005) when (re)describing another chimpanzee subspecies (*marungensis*, Noack, 1887), morphological and physical characters should be considered at least as much as genetic data in taxonomical research. It would therefore be of great value to collect both genetic and physical/morphometric data of wild-born captive chimpanzees in order to better understand variability in the species. The case study here reported demonstrates how many scientific opportunities may be lost owing to a lack of collaboration between zoos and museums in the disposal of zoo specimens (Gippoliti and Kitchener, in press).

Giorgio, a male of exceptionally large body size, showing the elongated head typical of P. t. verus. *He lived at Rome Zoo from 1947 to 1990. (Photo: Baschieri Salvadori)*

All available evidence suggests that *vellerosus* really is a distinct taxonomic unit worthy of conservation efforts and further scientific inquiries. In fact, while genetic data put *vellerosus* close to *verus* in a 'western group' (Gonder *et al.*, 1997; Gonder *et al.*, 2006), non-metrical cranial characters place it in a 'central/eastern group' together with the nominate form and *schweinfurthii* (Groves, 2001). A recent study of molar morphometrics reaches similar conclusions (Pilbrow, 2006). As already suggested by Won and Hey (2005), *vellerosus* may have a key role in the understanding of the evolutionary history of *Pan troglodytes*, and possibly of the whole genus *Pan*. It is possible that the incongruence between molecular and morphological data is due to the basic position of Nigerian chimpanzees in the *Pan troglodytes* clade. This would reflect the geographic centrality of Nigeria, whose chimpanzees should be at the roots of both western *verus* and central/eastern *troglodytes/schweinfurthii/marungensis*. If this is true, the physical appearance of these chimpanzees may tell us something about the common ancestor of the two living *Pan* species.

This case study show that wild-born chimpanzees belonging to the lesser-known Nigerian subspecies may be present in European zoos and preliminarily identified through their unique morphological characters. From the data available in the literature, Full appears as only the third *vellerosus* identified in Western zoos and laboratories (Gagneaux *et al.* 1999; Ely *et al.*, 2005), and the first following *ad hoc* genetic analysis. Considering the conservation status of *P. t. vellerosus* and its genetic, morphological and, possibly, behavioural distinctiveness, a greater involvement of zoos in *in situ* and *ex situ* conservation of this taxon seems desirable.

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