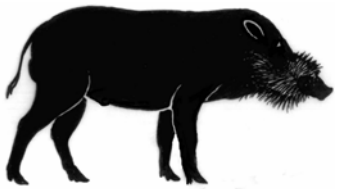
Papers and communications



A photographic guide to the differences between the Common Warthog (*Phacochoerus africanus*) and the Desert Warthog (*Ph. aethiopicus*)

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Introduction

The IUCN/SSC Pigs, Peccaries and Hippos Conservation Action Plan stressed the important gaps in our knowledge of *Phacochoerus aethiopicus* after the revelation of the existence of a "Somali Warthog", *Ph. aethiopicus delamerei*, a living representative of the Cape warthog, a taxon thought to be extinct since 1860 (Grubb & Oliver 1991; Grubb 1993). The Plan recommended a number of priorities for conservation action and for research, in view of clarifying the systematic and ecological relationships between *P. aethiopicus* and *P. africanus* (Vercammen & Mason 1993; d'Huart & Oliver 1993). These recommendations included an assessment of their conservation status, of their ecological requirements and of their interaction at the edge of their respective distributions, as this should provide the basis for appropriate management and it would allow to determining whether allopatry, sympatry or intergradation occurs in these areas.

In recent years, several initiatives have been taken to follow up on some of those recommendations. Some preliminary results have been published on the respective distribution and habitat of the two species in the Horn of Africa (d'Huart & Grubb 2001), and a mitochondrial DNA analysis has revealed the deep genetic divergence between them (Randi *et al.* 2002). However, specific field studies have yet to be undertaken on the behavior, ecology and habitat requirements of *P. aethiopicus*; although the Desert warthog is a species still virtually unknown at the present time, it may indeed prove to be one of the most specialized of all suids.

While several papers have described in detail the differences between the skulls and teeth patterns of *P. aethiopicus* and *P. africanus* (see Grubb 1993 for a summary), no publication has yet illustrated them and reported the differences of external appearance between the two species. The differences between these two species that have lived side by side in vast areas (N Kenya, SE Ethiopia, Somalia) where a great deal of collection and scientific investigation took place in the last century, were rarely noticed in museum material and never noticed in the field. This suggests that no strikingly different features distinguished them in the field. However, the internet and contribution from a number of field investigators have now provided good photographic reference sources, allowing the comparison of large series of close-up pictures of these two species.

The aim of this short note is to offer a visual reference framework which can help field observers and scientists to easily distinguish Desert warthogs from Common warthogs, on the basis of a limited number of representative pictures. Two series of photographs are presented here: one illustrating the distinctive features of their skull and dentition, and a second allowing comparison of differences in their external morphology. The authors recognize that there may be additional permanent features that are specific of each species, but these would need further research. Other differences have been noticed, but they may be attributable to local variations or natural variability. The characteristic differences presented here are based on the morphology of adults (particularly adult males), and are the most prominent that should consistently be checked for identification.

The principal features of the Desert warthog, *P.*

aethiopicus, in comparison to the Common warthog, *P. africanus*, are:

1. Differences in cranial and dental features

o The skull is relatively smaller, but proportionately shorter and broader;

o **Thickened zygomatic arches**: the front part of the zygomatic arch is thickened by internal sinuses and swollen into a spherical hollow knob just in front of the jugal-squamosal suture (in the Common warthog, the zygomatic arch may be robust but it is never quite so thickened and there is no formation of a knob);

o **Enlarged sphenoidal pits:** In the Common warthog the skull roof behind the internal nares is marked by two deep and distinct "sphenoidal pits", not found in any other African suid, while in the Desert species, these pits have expanded enormously, disappearing as distinct entities, so as to contribute to two vaults between the pterygoids, separated by a deep vomerine ridge.

Absence of incisors: there is never any trace of upper incisors, even in relatively young individuals, and the lower incisors, even if present, are rudimentary and non-functional, and reduced to 2 pairs maximum (whereas the Common warthog always has two upper incisors, though these may be lost in very old animals, and usually six functional lower incisors in the adult dentition of normal suine form);

2. Differences in external appearance

Several accounts of morphological differences in the external appearance of both species have been reported. Features like the paler color of the mane, lighter body size, or black markings on limbs, are not necessarily characteristic of the Desert warthog and do vary individually.

On the basis of numerous pictures taken in the field in many parts of their range, the following features seem to be the best permanent and distinctive identification criteria:

o **Hook-shaped genal warts:** in adult Desert warthogs, the genal (jugal) warts are always hook-shaped, whereas they are cone-shaped in the Common warthog. There is, however, a large variation in the volume and the form of these warts, as well as in their orientation.

o **Tip of ears bent backwards:** the tips of the ears in Desert warthogs are always bent backwards. This feature gives the impression that the animals have rounded or blunt tips to their ears and that the contour of the ear is angular. In contrast, Common warthogs have pointed, leaf-shaped ears, with a sinuous contour;

o **Swollen suborbital areas:** the suborbital areas in Desert warthogs are swollen in the form of pouches that often extend to the base of the genal warts. These same areas in Common warthogs have never such a pronounced swelling;

Egg-shaped vs. Diabolo-shaped head: the comparatively broader skull of the Desert warthog and its shorter basi-occipital region give the impression that the head is more egg-shaped, whereas it looks more diabolo-shaped in the Common warthog.

In addition to the following photographs, these various features are also illustrated by the comparative pictures of Common and Desert warthogs from NE Kenya and Ogaden shown in Boy (2002), the excellent pictures of Desert warthogs by Alexandre Caron on the *Pigtrop* website (http://pigtrop.cirad.fr/fr/petits_curieux/SV_classification_Paethiopicus.htm), and the fine series of pictures of Common warthogs from Nairobi NP, published in Bradley (1972).

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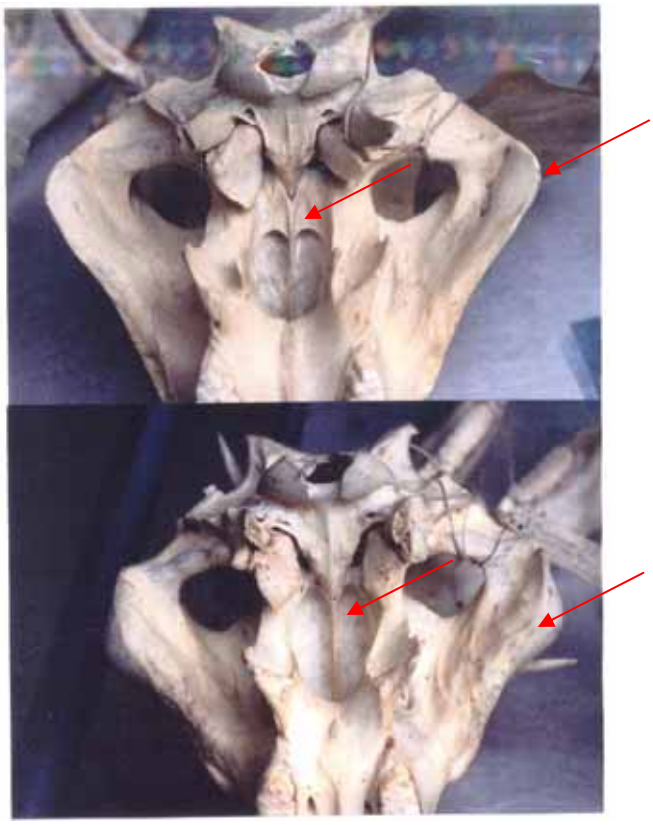
Craniological and dental differenciation between *Ph. africanus and Ph. aethiopicus*

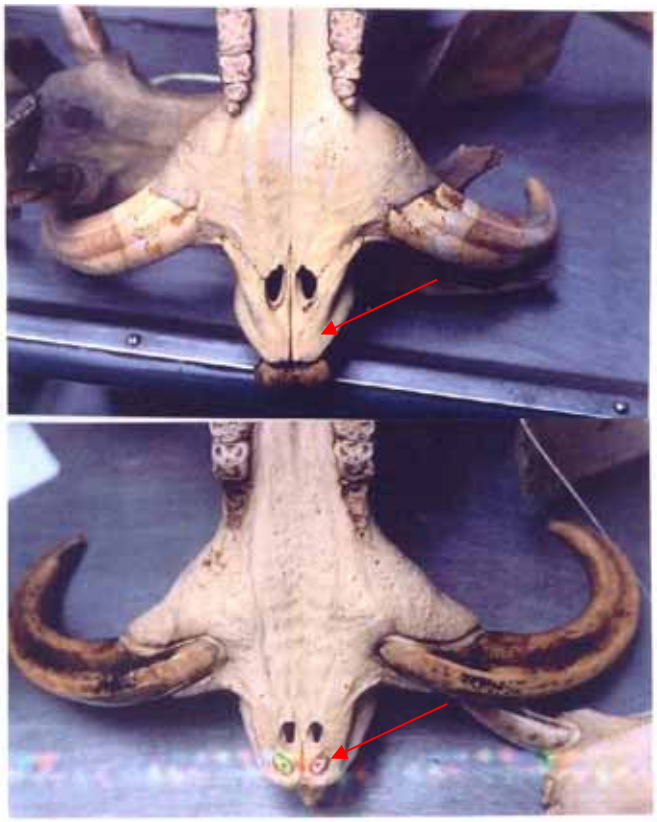
All pictures by Peter Grubb

Skull upper side. **L**: *Ph. africanus (BM 36.3.30.12);* ***R****: Ph. aethiopicus (BM 719V 81.5.11.2).* Note: inflated zygomatic arches and straighter occipital ridge in *Ph. aethiopicus*

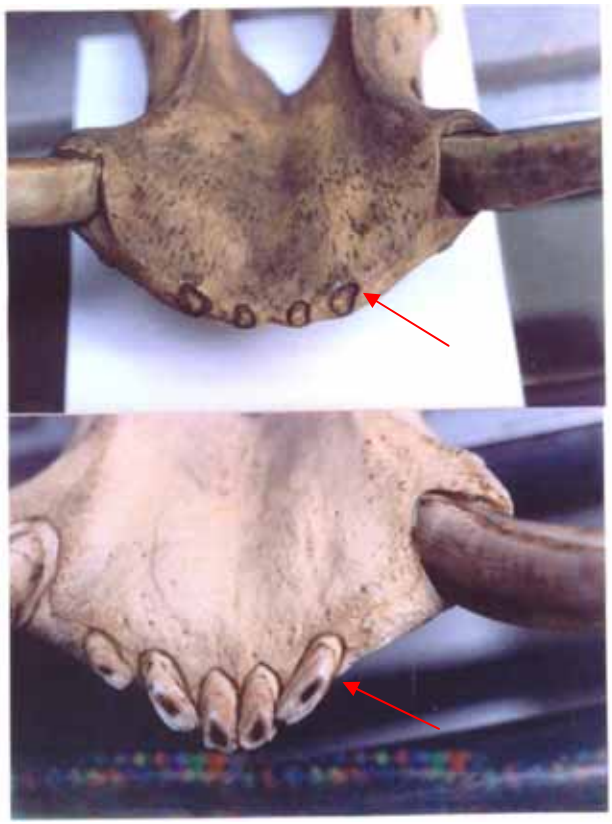
Skull lower side: L: *Ph. africanus* (BM 34.9.14.92); R: *Ph. aethiopicus* (BM collection number?). Note: inflated zygomatic arches and large "sphenoidal pits" in contact with auditory bullae in *Ph. aethiopicus*



Detail skull lower side: Top: *Ph. africanus* (BM 6.5.4.12); Bottom: *Ph. aethiopicus* (BM 12.7.28.1). Note: thickened zygomatic arches and larger "sphenoidal pits" in *Ph. aethiopicus*



Detail skull lower side: Top: *Ph. aethiopicus* (BM 50.8.24.25); Bottom: *Ph. africanus* (BM 36.3.30.12). Note: the pair of upper incisors are always absent in *Ph. aethiopicus*



Detail of mandible: Top: *Ph. aethiopicus* (BM 50.8.24.25); Bottom: Ph. africanus (BM 36.3.30.12). Note: Ph. africanus has usually 3 pairs of lower incisors; in Ph. aethiopicus lower incisors are absent, or vestigial and non-functional