Explorative 3D geometric morphometrics
on crania and mandibles of Cercopithecini (1024 specimens).

Stefania Lo Bianco, Roberto Micciché, Luca Sìneo

[a]Università degli Studi di Palermo, Palermo, Italy
E-Mail: stefania.lobianco01@unipa.it

ABSTRACT

A dataset of crania and mandibles from Old World primates was investigated through the use of 3D Geometric Morphometrics.
We focused the attention on the tribe Cercopithecini, sampling 1024 specimens preserved in 9 different museums and related to a total of 31 species.
Other 102 specimens belonging to 10 species of the same family Cercopithecidae were added as outgroup.
Our sampling campaign was carried on with a 3D-digitizer Microscribe G2X and the data were processed through the softwares Morphologika and MorphoJ.

We conducted both PCA and CVA analyses to investigate the power of resolution of the morphometric method and to understand the role of a-priori groups in the discrimination of the samples. Variables like sex, age and geographic localization, where present, were added to the analyses. Different sets of landmarks were selected with the aim to highlight those characters with major variability.

Even if every skull shows a peculiar morphology, we were not able to go beyond the genus level for genera with many species inside.
We found that the a-priori specification is fundamental to obtain a clear clusterization of genera.
The "sex" variable does not affect the reliability of the analyses, probably because factors we did not consider like body and teeth sizes have a strong impact on discrimination.
In regard to the "age", it can be notice that "infant" samples gather separated from "adult" ones, while "juveniles" lie in the middle.
Surprisingly, we found a slight split between West and East Africa species.

The morphometric methodology can be helpful in the separation of species with deep morphometric differences or long evolutionary distances. Nevertheless, as in the tribe Cercopithecini most of the species show a recent history and similar lifestyle, it was not possible to discriminate up to the species level with this method.
Thus, we consider more useful to adopt a genus level approach to design the evolutionary history of the tribe.

Key words: Geometric Morphometrics · Cercopithecini · Crania · Mandibles