...going one step further

VP760/1

(1001299)

Chimpanzee[1]

English

Species	*Pan troglodytes* (Gmelin, 1788)[2]
Subfamily	Ponginae Allen, 1925
Family	Pongidae Elliot, 1913
Superfamily	Hominoidea Simpson, 1931
Infraorder	Catarrhina Hemprich, 1820
Suborder	Simiae Haeckel, 1866
Order	Primates Linnaeus, 1758

The skull of this young adult, middle-sized female chimpanzee shows a relatively low level of relief. Apart from the pronounced supra-orbital ridges, the cerebral cranium appears somewhat smooth and could quite readily be compared with that of the human in this respect[3]. With older animals, this would no longer be as reasonable.

In the chimpanzee's skull too, the disproportionate size of the face/jaw part (the facial bones, i.e. the splanchnocranium or viscerocranium) in relation to the cerebral cranium is noticeable. This relationship, however, only develops in the course of postnatal growth – particularly at the time of the second dentition.

The occipital condyles of the atlas joint and the great occipital foramen they enclose (*foramen occipitale magnum*) are located in the posterior region of the skull. Here too, the obvious contrast with the newborn or infantile animal is evident.

The sexual dimorphism of the skull appears only at first sight to be less marked in the chimpanzee than in other Ponginae. As is the case with all primates that have been investigated in this respect, male chimpanzees display on average a larger brain volume, larger and differently shaped canine teeth, and a significantly more pronounced skull relief. Mature males in all cases, and mature females relatively often, have a sagittal crest – if less pronounced than that of the gorilla. All adult animals develop occipital crests, due to their "front-heavy" heads.

In general supra-orbital ridges (*tori supraorbitales*) are formed, which are linked medially by a glabellar ridge (*torus glabellaris*) to form a unified brow ridge (*torus frontalis*). Not unrelatedly, the frontal sinuses are very pronounced. This development takes place in connection with the formation of the permanent teeth and then with the wear of the teeth with continuing abrasion from chewing[4].

The upward branch of the lower jaw (*ramus mandibulae*) is relatively low. Typical of the Ponginae is the more or less parallel arrangement of the premolar and molar teeth. In front of them are the incisor teeth. The sexually differentiated, dagger-like canine teeth extend distinctly beyond the occlusion plane. For this reason, in the upper jaw between the canine tooth and the first premolar, there is a gap, or diastema, into which the lower canine tooth engages.
The anterior teeth engage one over the other like shears, which makes it easier to bite off a piece of food, while the posterior teeth have broad, shallow crowns, suited to grinding; this constitutes – in the case of the molars – what is known as the dryopithecine pattern, which is also displayed by humans. In the chimpanzee too, the enamel shows furrows on the occlusion plane next to the fissures; these are few in number but characteristic.

Since the pioneering studies of E. Selenka around 1900, chimpanzees are considered the closest living relatives of humans. They took this distinction over from the orang-utan.

Chimpanzee[1]

Some dimensions of the original chimpanzee skull[5].

max. length of cranium (inc. brow ridge and occipital crest)	132 mm
max. breadth of cranium	118 mm
skull breadth in region of max. postorbital narrowing	71 mm
volume of cranial cavity = “brain size”	390 ccm
length of face	127 mm
breadth of upper face (external biorbital breadth)	97 mm
breadth of zygomatic arch	118 mm
max. separation of zygomatic arch from skull wall	21 mm
length of palate	70 mm
breadth of palate	33 mm
bicondylar breadth of mandible	98 mm
bigonial breadth of mandible	77 mm
height of *corpus mandibulae*	27 mm
ramus height of mandible	59 mm
ramus breadth	43 mm
total mass of skull	417 g
mass of cranium	319 g
mass of mandible	98 g

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1 This model was cast from an original from the Collection of the Johann Wolfgang Goethe University of Frankfurt am Main, Institute of Anthropology and Human Genetics for Biologists. For educational reasons the abraded teeth of the original were reconstructed following younger female specimens in Munich, so as to be able to give a better representation of the tooth pattern. In this process, some adaptations to the jaws had to be made.

2 The scientific name of the chimpanzee has recently been the subject of renewed debate. Other authors are also given in the literature.

3 However, the chimpanzee is well behind the orang-utan in this respect. Its particularly close relationship with humans is established in other ways.

4 With increasing flattening of the tooth biting surfaces, the chewing force must be increased, which leads to increased growth of the masticatory muscles, which in turn leads to more pronounced moulding of muscle attachment surfaces. Here too, the distribution of the ever-increasing chewing force over the facial skeleton results in more pronounced structures. Here we see the effect of the spatial relationship between the largest organ in the head, the brain, and the others, particularly the eyes. In the African Ponginae this relationship is mainly horizontal (one behind the other), whereas by contrast in the orang-utan they are arranged more vertically (one above the other).

5 All dimensions were taken, from an original, by Dr sc. A. Windelband, Berlin. In general, model dimensions will vary slightly from these.