...going one step further

VP762/1

Gorilla[1]

English

Species	*Gorilla gorilla* (Savage & Wyman, 1847)
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 the mature, very large male gorilla presents a very marked relief. The cerebral cranium and the facial bones (viscerocranium), including the pronounced supra-orbital ridge (*torus frontalis*), have a rough appearance and are marked with bumps, ridges, etc., which were formed in response to the requirements of the masticatory and neck musculature. They are in no way comparable with those of the human.

In the gorilla'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.

On the sagittal suture, that is down the middle of the skull, a bony sagittal crest (*crista sagittalis*) develops, becoming more pronounced towards the back. It is formed from the parietal bones and serves as the origin of the temporal muscle[2], which increases in size as it approaches the crest. At the back of the head (the occiput) the sagittal crest joins the occipital crest, which develops as the neck musculature becomes stronger.

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 at first sight more pronounced in the gorilla than with other Ponginae. As is the case with all primates that have been investigated in this respect, male gorillas display on average a larger brain volume, larger and differently shaped canine teeth, and a significantly more pronounced skull relief. All mature males at least, as well as almost all mature females, have a sagittal crest. 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[3].

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 gorilla too, the enamel shows furrows on the occlusion plane next to the fissures; these are few in number but characteristic here too.

Since the pioneering studies of E. Selenka around 1900, gorillas have been considered the second-closest living relatives of humans.

English

Gorilla[1]

Some dimensions of the original gorilla skull[4].

max. length of cranium (inc. brow ridge and occipital crest)	221 mm
max. breadth of cranium	157 mm
skull breadth in region of max. postorbital narrowing	75 mm
volume of cranial cavity = “brain size”	675 ccm
length of face	217 mm
breadth of upper face (external biorbital breadth)	150 mm
breadth of zygomatic arch	189 mm
max. separation of zygomatic arch from skull wall	55 mm
length of palate	120 mm
breadth of palate	47 mm
bicondylar breadth of mandible	142 mm
bigonial breadth of mandible	154 mm
height of *corpus mandibulae*	43 mm
ramus height of mandible	131 mm
ramus breadth	80 mm
total mass of skull	1550 g
mass of cranium	1020 g
mass of mandible	530 g

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1 This model was cast from a replica of the original skull from the Senckenberg Institute and Natural History Museum in Frankfurt/Main. 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 Muscles cannot attach to one another, but require hard tissue for this purpose.

3 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).

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