

## Morphology of the Skull of Pygmy Hog (*Porcula Salvania*)-A Forensic Approach

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**Abstract:** The present investigation was undertaken to establish anatomical norms on gross anatomical study of skull of adult Pygmy hog. In the present investigation, three adult Pygmyhog were utilized. The skull was macerated and processed. The skull of Pygmy hog has frontal, lateral, nuchal and basal surfaces. The frontal surface of the skull was formed by the parietal, frontal, nasal, parts of the maxilla and the incisive bone and lateral surface has zygomatic arch which had no medial connection with the frontal bone was strongly curved dorsally like the roof of the cranium. The nuchal surface of the skull of pygmy hog was formed in the middle by the squamous and the lateral parts of the occipital bone and at the two sides by the squamous temporal bone. The basal surface of the skull which formed the osseous hard palate was almost completely enclosed by the alveolar processes of the maxilla and the incisive bones. Result obtained showed that the skull of adult Pygmy hog has a very short zygomatic process of the frontal bone leading to incomplete bony orbit.

**Keywords:** Morphology, Skull, Pygmy hog, Forensic, Approach.

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### I. Introduction

The Pygmy hog (*Porcula salvania*) is the world's smallest suid [1, 2]. This unique hog which was found in Himalayan foothills, now confined to small isolated pocket of Manas Tiger reserve and few reintroduced population in Sonai-Rupai wildlife sanctuary and Orang National Park of Sonitpur and Darrang district of Assam, India, respectively[3]. The adult hog measures about 65 cm in length and 25 cm in height and weight about 8 to 9 kg. The tail is about 2.5 cm in length and only three pairs of mammary glands are present. In recent years, studies on various fields of wildlife species are gaining importance in biological sciences. Moreover, incorporation of wildlife in different disciplines makes it imperative to know the normal morphology of the same. The present investigation was carried out to elucidate the gross anatomical features of the skull of pygmy hog (*Porcula salvania*).

### II. Materials And Methods

The present study was conducted on the skull of three adult pygmy hog which was collected during post-mortem examination in the Department of Veterinary Pathology, College of veterinary Sciences, Assam Agricultural University, Khanapara, and Guwahati-781022. The skull was macerated and processed [4]. The macerated skull was then used to record the various gross morphological parameters.

### III. Results And Discussion

The skull of Pygmy hog could be divided into frontal, lateral, nuchal and basal surfaces for the convenience of description.

The frontal surface of the skull was formed by the parietal, frontal, nasal, parts of the maxilla and the incisive bone (Fig.1). The zygomatic process was very short and pointed as in other porcine; [5] leading to incomplete supraorbital margin as in pig [6]. The frontal surface was separated from the lateral surface by a ridge. The transition between the two surfaces was particularly prominent in the cranial region where it was represented caudally on the parietal bone by the temporal line and rostrally on the frontal bone (Fig.1). The frontal surface was gradually broadened caudally, from the level of the caudal margin of the nasal bone and then constricted to meet the rostro-caudal margin of the occipital bone. It presents the supraorbital foramen (Fig.1) which communicates through the orbit with the caudally curved supraorbital canal. The supraorbital groove runs forwards from the supraorbital foramen. The nasal bones were shorter and wider. The frontal suture was prominent.

In lateral surface, the zygomatic arch which had no medial connection with the frontal bone was strongly curved dorsally like the roof of the cranium. The caudal end of the arch projects as a process beyond the external acoustic meatus (Fig. 2). The external acoustic meatus opens through the external acoustic orifice

which was hidden caudal to the zygomatic arch. The frontal process of the zygomatic bone and the zygomatic process of the frontal bone were short, had a gap between them as in domestic cat [7]. This dorsal gap in the orbital aditus was closed in life by the orbital ligament. The temporal fossa was shallow and lies in a more horizontal direction. The facial crest took the form of a prominent, sharp-edge ridge which was largely confined to the maxilla (Fig. 2) in contrast to prominent facial crest in other domestic animals [6]. The entrance to the lacrimal canal, which in other domestic mammals lies in the medial angle of the orbit, was represented in the pygmy hog by one lacrimal foramen (Fig.2) lying on the facial surface of the lacrimal bone. The fossa canina (Fig.2) which was characteristic of pygmy hog situated on the lateral surface of the face in front of the orbit. The infraorbital foramen was palpable about two fingers breadth above the 2<sup>nd</sup> cheek tooth. The canine tooth curved upwards and its root causes an irregular enlargement on the maxilla, the canine eminence (Fig.2). The maxillary foramen was large and it lies dorsolateral to the caudally extended maxillary tuberosity. The pterygopalatine fossa took the form of a deep, horizontal cleft. The small round sphenopalatine foramen was located dorsomedially in the perpendicular plate of the palatine bone.

The nuchal surface of the skull of pygmy hog was formed in the middle by the squamous and the lateral parts of the occipital bone as in goat and domestic pig [8,9] and at the two sides by the squamous temporal bone. This surface was separated from the lateral surface by the sharply defined nuchal crest and at the sides by the temporal crest. The squamous part of the occipital bone was excavated on this surface to form the very deep squamous occipital fossa (Fig.3). The height and width of the foramen magnum were 2.0 cm and 1.5 cm respectively. Laterally the occipital condyles converge with each other ventrally. The paracondylar processes were distinctly long (Fig.3).

The basal surface of the skull which formed the osseous hard palate was almost completely enclosed by the alveolar processes of the maxilla and the incisive bones. The horizontal plate of the palatine bone also contributes quite considerably to the formation of the palate. The alveoli for the five cheek teeth and one canine on either side were contained in the maxilla and the two far incisor teeth on either side by the incisive bones in contrast to seven cheek teeth, one canine and three incisor teeth in other pigs [6]. The palatine fissure was wide. The palatine groove was deep and extensive and runs forward from the major palatine foramen. The jugular foramina were located at the border between the lateral occipital bone and the tympanic bullae (Fig.4) in contrast to domestic pig where it was located between the basioccipital and the tympanic bullae [5]. The tympanic bullae were large, slightly compressed laterally and placed obliquely (Fig.4).

The choanae were short and board. The lateral wall on either side was formed by the perpendicular plate of the palatine bone and the pterygoid bone. The sphenoid process projects as a ventral nodule from the palatine bone and the flat hamulus from the pterygoid bone (Fig.4). The Cephalic Index of the skull was 64.74.

#### **IV. Conclusion**

In the current study, the gross anatomical studies on the skull of adult pygmy hog revealed very short zygomatic process of the frontal bone leading to incomplete bony orbit. The frontal surface was gradually broadened caudally, from the level of the caudal margin of the nasal bone and then constricted to meet the rostral-caudal margin of the occipital bone. The caudal end of the Zygomatic arch projects as a process beyond the external acoustic meatus. The entrance to the lacrimal canal was represented in the pygmy hog by one lacrimal foramen. The squamous occipital bone revealed the very deep squamous occipital fossa. The jugular foramina were located at the border between the lateral occipital bone and the tympanic bullae. The tympanic bullae were large, slightly compressed laterally and placed obliquely.

It might, therefore be concluded that the observations in the present study established a major role in recording the anatomical norms on skull of Pygmy hog which will help forensic anthropologist and alignment of clinical conditions.

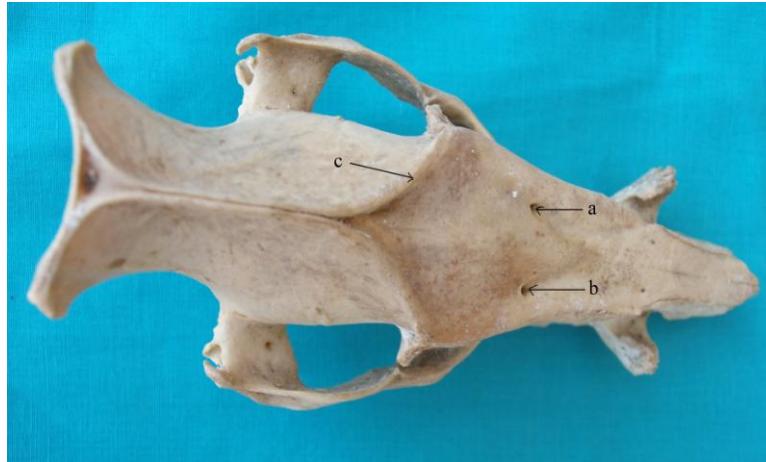
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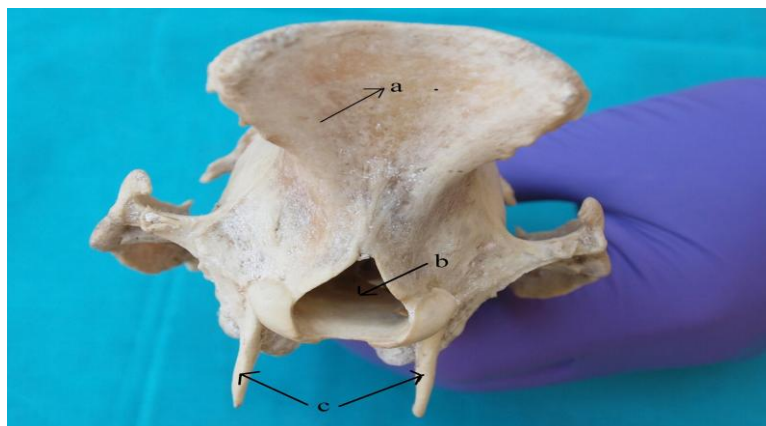
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**Fig.1:** Photograph of the frontal surface of skull of Pygmy Hog showing (a) Supraorbital foramen, (b) Supraorbital groove and (c) Temporal line



**Fig.2:** Photograph of the lateral surface of skull of Pygmy Hog showing (a) Caudal end (b) Zygomatic arch (c) Fossa Canina and (d) Canina eminence



**Fig.3:** Photograph of the Nuchal surface of skull of Pygmy Hog showing (a) Squamous occipital fossa, (b) Foramen magnum and (c) Paracondylar process



**Fig.4:** Photograph of the basal surface of Skull of Pygmy Hog showing (a) Jugular foramen, (b) Tympanic bulla, (c) Sphenoid process, (d) Hamulus pterygoideus and (e) Palatine fissure.