

SOME NEW REMAINS OF *PACHYPORTAX* (BOVIDAE, ARTIODACTYLA) FROM THE MIDDLE SIWALIKS OF PAKISTAN

SADAF ASLAM, ABDUL MAJID KHAN*, MUHAMMAD AKBAR KHAN, MUHAMMAD AKHTAR AND MUHAMMAD KHALED SIDDIQ

Department of Zoology, University of the Punjab, Lahore (SA, AMK, MAK, MA), Government College for Men, Sarai Alamgir, District Gujrat (MKS) Pakistan.

Abstract: New fossil remains of *Pachyportax* are described in this paper. The material is collected from a Late Miocene locality of Hasnot, Jhelum, Punjab, Pakistan. The remains are identified on the basis of morphological and metrical characters and assigned to *Pachyportax latidens*. The boselaphines were present in the Late Miocene of the Siwaliks with other mammalian groups like proboscideans, ruminants and carnivores. The new sample of *P. latidens* from Hasnot contributes to new knowledge of the species.

Keywords: Boselaphines, Hasnot, Siwaliks, Late Miocene, Dhok Pathan Formation.

INTRODUCTION

Pachyportax is a moderate to gigantic sized-bovid, upper molars strongly hypsodont, quadrate, median basal pillar much extended transversely, relatively strong styles and ribs, enamel moderately thick and rugose with traces of cement. Lower molars hypsodont with distinct median basal pillar, median ribs and stylids moderately developed (Pilgrim, 1937). Lydekker (1876) described a right M₃ (GSI No B219) under the name *Cervus latidens*. He also described a lower molar (GSI No. 23) under the same heading. Later on, Lydekker (1884) realized that these specimens did not belong to the family Cervidae. To the same species, *Cervus latidens* he referred a left maxilla with P₂-M₃ (GSI No. B218a) and

provisionally assigned these three species to the genus *Oreas*. Lydekker (1878) described and figured a horn-core under the name *Capra* sp.

Pilgrim (1937) applied the generic term *Pachyportax* to all these above said specimens and referred them to one species *i.e.*; *Pachyportax latidens* (Lydekker) Pilgrim. He made the type specimen an isolated M₃ (GSI No. 219). Pilgrim (1939) described a new species *Pachyportax nagrii* from Nagri, the Dhok Pathan stage of the Middle Siwaliks. *Pachyportax* is present in the Nagri and Dhok Pathan formations of the Middle Siwaliks (Lydekker, 1876; Pilgrim, 1937; Khan, 2007). It is also present in the Tatrot zone of the Upper Siwaliks (Akhtar, 1992, 1995; Akhtar *et al.*, 2003; Ahmed *et al.*, 2006; Bhatti *et al.*, 2006). The material under study is from Hasnot, the Dhok Pathan stage of the Middle Siwaliks in the Jhelum district, Punjab province, Pakistan.

MATERIAL AND METHODS

The specimens were found partly exposed and excavated during field works by the authors (MA, MAK, and AMK). The fossils are housed in the Dr. Abu Bakr Fossil Display and Research Center of the Department of Zoology, University of the Punjab, Lahore, Pakistan. The specimens catalogue in two series *i.e.* the yearly catalogue number and the serial catalogue number. The upper figure denotes the collection year, while the lower one denotes the serial number of the respective specimen. Uppercase letter stands for upper dentition and lowercase for lower dentition. Measurements of the specimens are given in millimeters (mm), and taken with the help of metric Caliper. Tooth length and breadth were measured at occlusal level.

Abbreviations: PUPC – Punjab University Palaeontological Collection; AMNH – American Museum of Natural History; GSI – Geological Survey of India; Fm – Formation; m – lower molar; L – length; W – width; l – left; r – right; Ma – million years ago; mm – millimeters.

SYSTEMATIC PALAEOLOGY

Family Bovidae Gray, 1821

Sub family Bovinae Gill, 1872

Tribe Boselaphini Simpson, 1945

Genus *Pachyportax* Pilgrim, 1937

Type species: *Pachyportax latidens* (Lydekker) Pilgrim, 1937.

Included species: *Pachyportax latidens* (Lydekker) Pilgrim, 1937; *Pachyportax nagrii* Pilgrim, 1939; *Pachyportax giganteus* Akhtar, 1995.

Generic distribution: The genus *Pachyportax* is present in the Nagri and Dhok Pathan zones of the Middle Siwaliks (Lydekker, 1876; Pilgrim, 1937). It is also present in the Tatrot Zone of the Upper Siwaliks (Akhtar, 1992, 1995).

Generic diagnosis: A moderate to gigantic sized-bovid; upper molars strongly hypsodont, quadrate, median basal pillar much extended transversely, relatively strong styles and ribs, enamel moderately thick and rugose with traces of cement. Lower molars hypsodont with distinct median basal pillar, median ribs and stylids moderately developed (Pilgrim, 1937).

Pachyportax latidens (Lydekker)

Type locality: Hasnot, Jhelum district, the Punjab province, Pakistan.

Horizon: Upper part of the Middle Siwaliks.

Distribution: The species *Pachyportax latidens* (Lydekker) Pilgrim is known from the Dhok Pathan of the Middle Siwaliks.

Diagnosis: A *Pachyportax* of very large size; upper molars quadrate, with strong median basal pillar much extended transversely; relatively strong styles and ribs, enamel moderately thick and rugose with traces of cement. The median basal pillar in lower molars moderately developed, central cavities with simple outline and poor development of mesostylids (Pilgrim, 1937, 1939).

Material studied: An isolated upper second molar, IM2 (PUPC 05/7); an isolated lower second molar, rm2 (PUPC 04/42); an isolated lower second molar, rm2 (PUPC 05/8).

Description

PUPC 05/07 is an isolated left upper molar of in middle wear. Its anterior half is well preserved and the posterior half is broken. The crown is broad and low. The enamel is rugose. The rugosity is more prominent on inner side of molar than on the outer side of the molar. The difference appears due to weathering effect on the inner side. The enamel shows an almost uniform thickness all around the crown with an average thickness of

1.00mm. The median basal pillar is strong, transversely extended and highly developed. The protocone and paracone are missing. The hypocone is well developed. The parastyle is missing. The mesostyle is well developed. The metastyle is also well developed. The median ribs are strongly developed. They are more prominent near the summit of the crown. The anterior cavity is missing along with protocone and paracone.

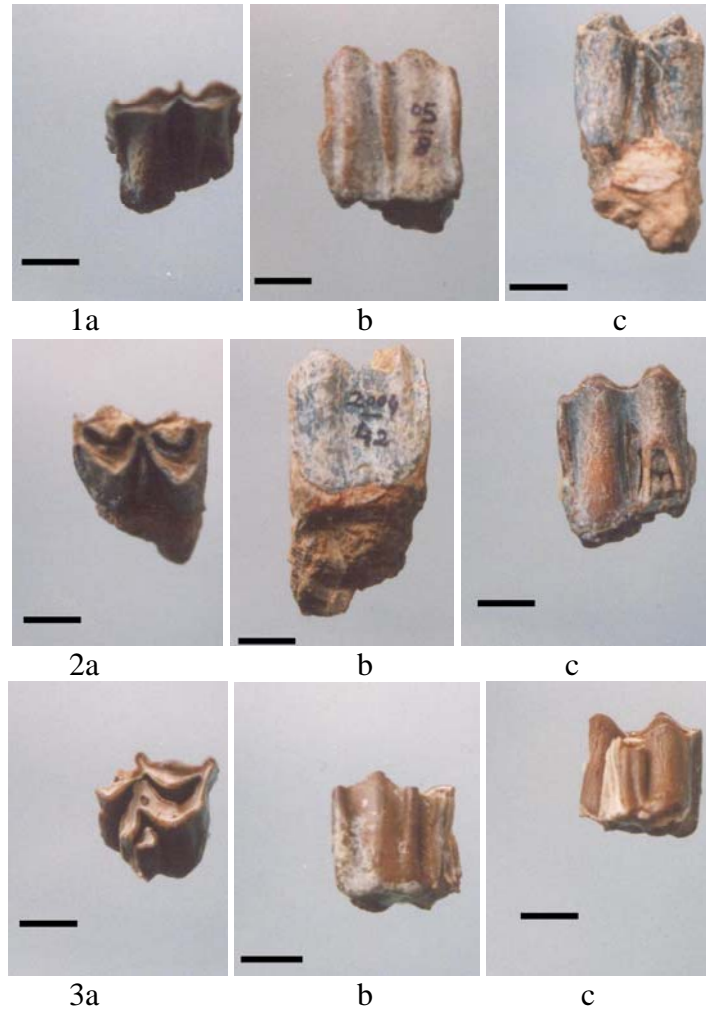


Figure 1. *Pachyportax latidens*: 1. PUPC 04/42, rm2; 2. PUPC 05/8, rm2; 3. PUPC 05/7, IM2. a = occlusal, b = buccal, c = lingual. Scale bar 10mm.

PUPC 04/42 is an isolated right second molar of mandibular ramus in middle wear. The crown is high and narrow. The enamel is rugose. The rugosity is very prominent around outer side of the protoconid and hypoconid than the inner side of entoconid and metaconid. The enamel is slightly damaged internally. The median basal pillar is strong and closes to the anterior side of the hypoconid. The protoconid is V-shaped. It is slightly lower than hypoconid.

The hypoconid is also V-shaped. It is less worn than the protoconid. It is higher than protoconid. It is broader antero-posteriorly than the protoconid. The metaconid is well developed but it is slightly worn. It is shorter than entoconid. The entoconid is also well developed. It is slightly longer than metaconid. The roots are also well preserved. It is longer below the protoconid and shorter below the hypoconid. The anterior transverse flange is present. The metastylid is highly developed. The entostylid is also well developed but it is slightly damaged at the tip. The mesostylid is less prominent.

The median ribs are strongly developed but they are more prominent near the summit of crown. The median ribs of the entoconid are slightly damaged. The central cavities are well developed due to advance stage of wear. The cavities are wider at the end and narrower in the center. These are crescentic in their general appearance. The anterior central cavity surrounded by protoconid and metaconid is slightly shorter than posterior cavity surrounded by hypoconid and entoconid. The posterior cavity is higher than anterior cavity.

Table I: Comparative measurements (mm) of the studied specimens of *Pachyportax latidens*.

	Studied specimens			AMNH*	AMNH*	Indian Museum* Collection
	PUPC 04/42	PUPC 05/8	PUPC 05/7	AMNH No.229964	AMNH No.19730	GSI No B 129.
L	26.30	24.50	23.6	28.0	28.5	26.5
W	15.00	10.50	19.3	25.0	28.5	-
W/L	57.03	542.85	81.77	89.0	100	-
H	28.00	32.50	24.40	-	-	-
H/W	186.6	309.52	126.42	-	-	-

*Referred data are taken from Pilgrim, 1937.

PUPC 05/08 is an isolated left second molar of mandibular ramus. Its half part is well preserved and half part is missing. Roots are missing. It is in middle stage of wear. The crown of specimen is high and narrow. The rugosity is more prominent on outer side of molar. The median basal pillar is missing. The protoconid and entoconid are missing. The metaconid is well developed but it is slightly worn. It is shorter than entoconid. The entoconid is well developed. It is slightly longer than metaconid. The central cavities are missing along with protoconid and hypoconid. The teeth measurements are provided in Table I.

DISCUSSION

From the Siwaliks no complete skull with mandible of this species has been recovered for this species. Lydekker's work was later on reviewed and supplemented by Pilgrim (1937, 1939). He referred a number of isolated teeth, damaged skulls maxillary fragments, mandible ramii, horn cores, parts of tibia and femur to this species. Dental morphology of the molars is very well known but that of the premolars is unknown. The present collection comprises isolated molars of maxilla and mandible. The most prominent feature of the upper molars is the transverse extension of the median basal pillar as mentioned by Pilgrim (1937). It varies to some extent in its longitudinal dimension toward the lingual side; in some it is lightly broader. The roughness of the enamel is also variable. In some species it is rough; in others it is smooth, in all probability it is due to weathering. The variation has been mentioned by early workers also.

The specimens under study show all the morphological features of the species *P. latidens* cited by Pilgrim (1937, 1939). First molar shows all the morphological features of the species *P. latidens* cited by Pilgrim (1937, 1939). First molar shows all the morphological features of the species *P. latidens*. The preserved crown height and other measurements show that it is brachydont and broad crowned as shown by the H/W and W/L indices. The second molar resembles the type specimens (GSI B219) in antero-posterior length and American Museum of Natural History (AMNH) specimen No. 19730 in crown width. He did not give the preserved height of the crown. The other referred specimens in the AMNH measured by Pilgrim (1937) are narrow crowned (Table I). The difference

seen in these dental measurements is quite insignificant. They resemble in height however their indices indicated that they are narrowing crowned.

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