

New fossils of *Pachyportax* (Bovidae, Mammalia) from middle Siwaliks, Punjab, Pakistan

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ARTICLE INFORMATION

Received: 05-12-2018

Received in revised form:
29-04-2019

Accepted: 17-05-2019

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Short Communication

ABSTRACT

New fossils of bovids were recovered from the outcrops of Hasnot village of the Dhok Pathan Formation in District Jhelum, Punjab, Pakistan. The fossil includes dental material which consists of upper premolars and molars. Based on morpho-metry, the specimens were assigned to *Pachyportax latidens*. The fossils provide an evidence for the existence of the large sized animals in Pakistan during the Late Miocene -Early Pliocene.

Keywords: Paleontology, Taxonomy, Miocene, Pliocene, Dhok Pathan Formation

INTRODUCTION

Siwalik deposits are fresh water deposits found in Neogene time period range middle Miocene to upper Pleistocene and are characterized by sandstone, mudstone and coarse conglomerates (Andrews & Cronin 1982; Pilbeam 1982; Acharya 1994, Barry *et al.* 2002). The most fertile area for vertebrate fossil deposition is Potwar Plateau (Pilbeam *et al.* 1979; Badgley *et al.* 2008). The Siwalik Group represents one of the complete Neogene sequences of the World. Many mammalian taxa are recorded in the Siwalik Group of Pakistan (Pilgrim 1913; Colbert 1935; Barry and Flynn 1990; Khan *et al.* 2010, 2012, 2013, 2016).

The material, described here has been collected from the Hasnot outcrops (Fig. 1). Hasnot outcrops come in the Dhok Pathan Formation which belongs to the Miocene of Siwaliks of Northern Pakistan. The Middle Siwalik Neogene sediments span 11.2-3.5 Ma (Pilbeam *et al.* 1977; Barry 1987; Barry *et al.* 2002). "The Middle Siwalik Subgroup is divided into two formations, the lower one is the Nagri Formation and the upper one is the Dhok Pathan

Formation. The Hasnot sediments belong to the Dhok Pathan Formation of the Middle Siwaliks. Recently, the bovid fossils were unearthed from the Hasnot area (Fig. 1), Potwar Plateau northern, Pakistan ranging in age from the Late Miocene-Early Pliocene." The main objective of this article is the description of new fossils of *Pachyportax latidens* and its presence in the Siwaliks Pakistan.

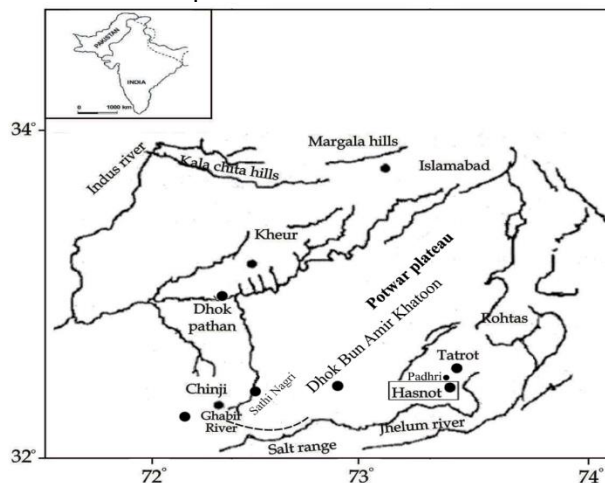


Fig. 1: Map of Potwar Plateau showing studied section Hasnot (enboxed) in northern Pakistan.

MATERIALS AND METHODS

The material included in this research paper had been collected in various field trips by surface collection method from the Hasnot village, Dhok Pathan Formation from Siwaliks of Northern Pakistan. After washing and preparation the specimens were measured using digital Vernier caliper in millimeters (mm) scale. The specimens were catalogued having inventory number in to series with yearly catalogue number (nominator) and serial catalogue number (denominator) e.g., PUPC 16/105.

Abbreviations: PUPC - Punjab University Paleontological Collection; AMNH - American Museum of Natural History, New York, USA; PMNH - Pakistan Museum of Natural History.

Systematic Palaeontology

Family Bovidae Gray, 1821”

Subfamily Bovinae Gill, 1872”

Tribe Boselaphini Simpson, 1945”

Genus *PACHYPORTAX* Pilgrim, 1937

Pachyportax latidens (Lydekker) Pilgrim, 1937

New Material: PUPC 16/110, P2; PUPC 16/105, IM1; PUPC 16/108, IM1; PUPC 16/106, rM3; PUPC 16/107, left M.”

Description

PUPC 16/110 is a partial premolar. It is in late stage of wear and is asymmetrical. The enamel is thin anteriorly and thick labially. The cavity lacks any spur. The parastyle is weakly developed and near to the midrib (Fig. 2(1)). The remaining specimens in the paper are all upper molars and are in late stage of wear. The entostyle is extended transversely. A dentinal eyelet is present between the lobes. The major cones are furnished by cristae. The preprotocrista and postprotocrista are prominent. The posthypocrista is larger than the prehypocrista. The mesostyle and parastyle are prominent. The fossettes are prominent among the cusps (Fig. 2(2-5)).

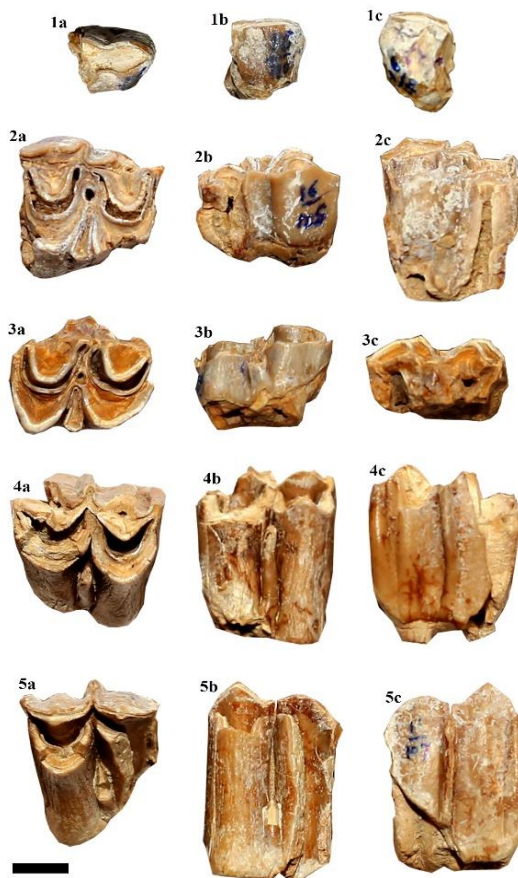


Fig. 2: “*Pachyportax latidens*: 1. PUPC 16/110, left P2; 2. PUPC 16/105, left M1; 3. PUPC 16/108, left M1; 4. PUPC 16/106, right M3; 5. PUPC 16/107, left M. Views: a, occlusal; b, lingual; c, labial. Scale bar 10 mm.”

COMPARISON AND DISCUSSION

Systematic palaeontology of the fossil remains shows their similarities to genus *Pachyportax* on the basis of shape and size of dental material studied in this research. The upper molars are quadrate in shape and have strong median basal pillar and well developed styles and rib. The enamel is moderately rugose. These all characters are prominent in the given specimens (Pilgrim 1937) Table 1. Collected specimens are not enough, hence these samples are assigned to *P. cf. latidens*. “*Pachyportax* is considered as the characteristics Late Miocene taxon, commonly reported from the Middle Siwaliks of Nagri and Dhok Pathan formations (Akhtar *et al.* 1997). This genus has also been reported from the Hasnot outcrops showing Dhok Pathan Formation by Khan

et al. (2009). There are two species of this genus in the Middle Siwaliks: *P. latidens* (large sized) and *P. nagrii* (small sized; Pilgrim 1937, 1939; Khan *et al.* 2009). The stratigraphic range of the recovered specimens reported here, is Late Miocene to Early Pliocene. Besides the Late Miocene occurrence of the *Pachyportax*, it has also been reported from the Early Pliocene (Pilgrim 1939; Akhtar 1992; Khan 2008; Khan *et al.* 2009).

The faunas of Negeringerawa, Namurungulea and Nakali dated 10.0-8.0 Ma and the faunas from the Mpsida, dated 7.0-6.0 Ma in Africa do not have the genus *Pachyportax* (Hill *et al.* 1985; Nakaya 1994; Kingston *et al.* 2002). This genus is also absent from localities; such as the Marageh (9.5-7.0 Ma), an Iranian locality (Bernor 1986) and Tagar (8.7-8.0 Ma) an Afghani locality (Sen *et al.* 1997).

Table I: "Comparative measurements (mm) of the studied specimens of *Pachyportax latidens*.* the studied specimens. Referred data are taken from (Pilgrim 1937)."

Inventory No.	Nature	Length	Width	W/L
PUPC 16/110*	P2	13.8	11.2	0.81
PUPC 16/105*	M1	25.1	23.5	0.93
PUPC 16/108*	M1	25.0	24.2	0.96
PUPC 16/106*	M3	23.0	25.1	1.09
PUPC 16/107*	M	24.7	23.4	0.94
P.M.N.H. 86/215	P2	17.7	17.0	0.96
PUPC 01/24	M3	28.4	25.0	0.88
PUPC 96/42	M3	30.2	22.5	0.74
AMNH 29914)	M3	36.0	34.0	0.94

CONCLUSION

New remains of *Pachyportax* are recovered from Hasnot, Jhelum, Pakistan. The Hasnot sediments represent upper part of the Dhok Pathan Formation. *Pachyportax* is a high crowned Late Miocene – Early Pliocene bovid species of the Siwalik Group. It may be considered as the endemic species of the Siwalik.

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