

# Collection of *Selenoportax* from the Kundi Wala Kas, Hasnot, Pakistan

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**Abstract.-** Four dental specimens are identified as a member of the Boselaphini (Bovidae) belonging to the extinct genus *Selenoportax* Pilgrim 1937. The specimens were collected from an extraordinarily well exposed stratum of the Kundi Wala Kas from the late Miocene of the Middle Siwaliks, situated in the vicinity of Hasnot, District Jhelum, Pakistan. Distinctive morphological details of the collected teeth are preserved but comparison is not possible because the specimens are not in more numbers, and are described as cf. *Selenoportax*. The specimens comprise an isolated third upper premolar, an isolated left lower incisor, an isolated third lower premolar and a mandibular fragment with fourth deciduous and first molar. The taxonomic status of the *Selenoportax* is also discussed.

**Key words:** *Selenoportax*, Hasnot, Kundi Wala Kas, late Miocene, Bovidae.

## INTRODUCTION

The river Bunha flows westwards of the village Hasnot and many fossils have been discovered along its course in the vicinity of Hasnot (Khan, 2007; Khan *et al.*, 2007; Farooq *et al.*, 2007; Barry, 1987; Pilgrim 1939). Many localities are reported in the vicinity of Hasnot by their vernacular names like Dheri, Kaali Peri, Huna Wala Mehra, and Mal etc. The locality Kundi Wala Kas is located at the bank of the river Bunah on the west of Hasnot (Fig. 1). Lithostratigraphically the sediments belong to the Dhok Pathan Formation of the Middle Siwaliks, which is characterized by sands, clay, silt, and gravels of fluvial origin and have rich collection of fossils (Barry *et al.*, 1982, 2002; Pilgrim, 1913). It is the upper formation of the Middle Siwaliks and consists of fluvial deposits developed in a wetland environment composed of a mosaic landscape with waters, reedy marshes, meadows of herbs and shrubs woodlands and forests (Barry *et al.*, 2002).

The fossils to be described in this paper come from the continental deposits of the Middle Siwaliks to have a late Miocene date (Barry *et al.*, 2002; Pilbeam *et al.*, 1977). A set of European reference levels or biochronology zones, the MN (mammiferes

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neogenes) or Mein Zones, equivalent to the Dhok Pathan Formation includes MN9-13 = late Miocene (10-5 mya) (Gentry, 2000). The following investigation deals with *Selenoportax* remains from one stratum exposed at one locality Kundi Wala Kas and contributes to recent work on the continental fluvial deposits of the Middle Siwaliks.

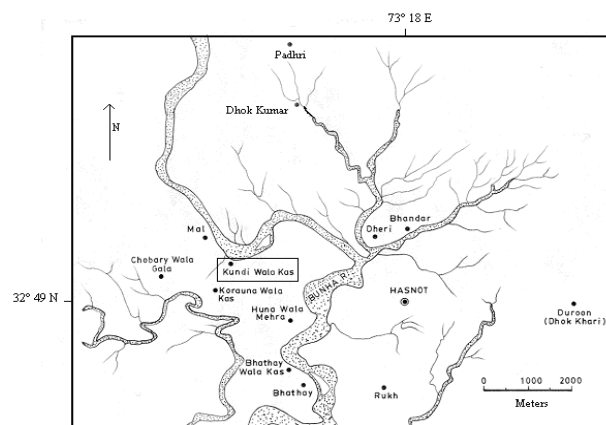


Fig. 1. The deposits in the Hasnot vicinity along the river Bunah; the studied area is encircled.

Morphologic and metric characters of the specimens are described and their systematic

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determination discussed. The terminology of the tooth crown elements and manners of measurements follow Gentry (1994). Measurements are given in millimeters (mm). Uppercase letter is for upper tooth that is P3 stand for upper third premolar and lowercase letters for lower teeth that are i1, d4, p4, and m1 stand for lower first incisor, fourth deciduous, fourth premolar and first molar, respectively.

#### *Abbreviations*

PUPC, Punjab University Paleontological Collection; Ma, million years ago; p, premolar; d, deciduous; m, molar; I, incisor; l, largest length; w, width; aw, anterior width; pw, posterior width; h, height.

### SYSTEMATIC PALAEOLOGY

Family BOVIDAE Gray 1821  
 Subfamily BOVINAE Gray 1821  
 Tribe BOSELAPHINI Knottnerus-Meyer 1907  
 Genus *SELENOPTAX* Pilgrim 1937

#### **cf. *SELENOPTAX* Pilgrim 1937**

Figs. 1 – 4

#### *Material*

PUPC 06/19 right P3 (l = 18.5, w = 18, h = 24.3); PUPC 06/18 probably second right incisor i2 (l = 9.4, pw = 9.3, aw = 8.1, h = 17); PUPC 06/15 left p3 (l = 21.5, w = 6, h = 9.2); PUPC 06/15 left lower jaw fragment with d4-m1 (d4: l = 27, w = 14.8, h = 8.5; m1: l = 23, w = 14.6, h = 24.4).

### DESCRIPTION

#### *Upper dentition*

The P3 is only one collected specimen belongs to the upper dentition. PUPC 06/19 is a horseshoe-shaped third premolar. The rib is present anteriorly near the parastyle, which indicate the 3<sup>rd</sup> premolar instead of fourth. The premolar is in early middle wear and the labial wall is differentiated with a weak profile. The metastyle and the rib are strong. The conical protocone is well developed. The occlusal outline of the premolar is nearly rectangular, being much broader transversely than

long. A sharp praeprotocrista unites a protocone with a parastyle and the P3 is supported by three roots.

#### *Lower dentition*

The right lower incisor is unworn and has a simple outline. The incisor has a wide cutting edge with the outer angle pulled outwards. In buccal view the crown is slightly inclined upwards posteriorly.

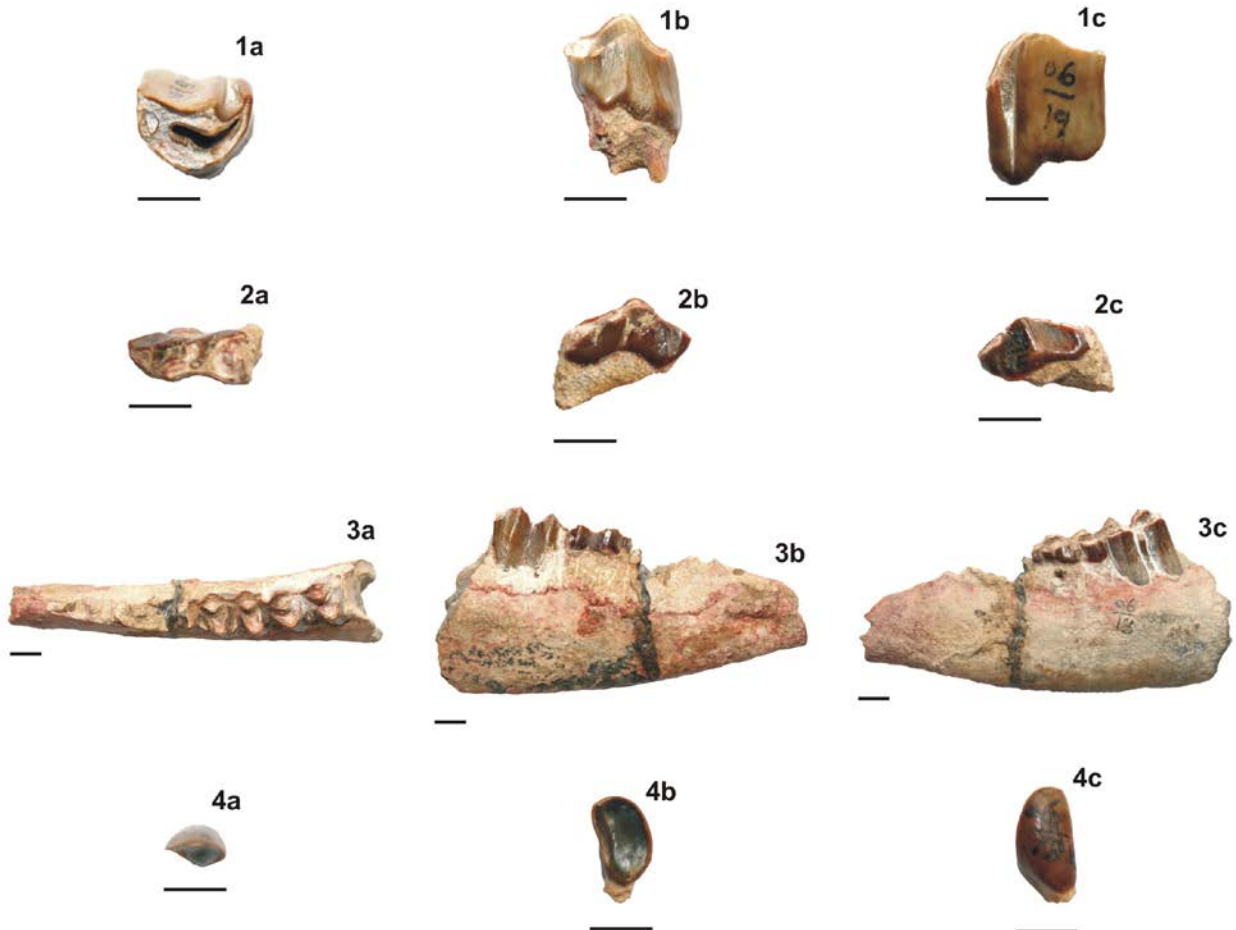
The d4 is in early late wear and consists of three lobes but the anterior one is broken. However, the base of the anterior lobe is preserved. It is lower crowned than the permanent first molar and correspondingly to the lower molar the lingual wall of each lobe is convex curved. The enamel is thin and the protoconulid is prominent. Some weak crests run in parallel to the postparacristid and praemetacristid, and the lingual part of the tooth is well developed. The tooth is strongly expanded labially and has small folds in the anterior and posterior wings of the protoconid. The valley between the anterior and medial labial lobes possesses a fold whereas the posterior valley is open posterolabially.

PUPC 06/15 is triangular in occlusal outline, being longer than it is wide. A labial groove is present between protoconid and hypoconid. The labial surface of p3 is evenly but slightly convex. There is no development of cingulids at the base of the crown. The p3 is much more robust and its cristids and conids are better expressed. The paraconid is conical and clearly displaced lingually. The protoconid is compressed and its posterior cristid extends to the posterior spur of the tooth. A conical metaconid occurs on the posterolingual side of the protoconid but it is lower than the later. The metaconid is transversal and expanded posteriorly. The posterolingual part of the tooth tends to form a small talonid. The entocristid and the hypocristid are partially fused. The postprotocristid shows a bent running. The prae- and postprotoconulid cristids are present and lingually oriented.

PUPC 06/13 is a left mandibular ramus with d4 and m1. The description of the deciduous molar is mentioned above. The roots of d2-3 are also preserved. The d2 and d3 are eroded and the conical crown apices of the non-erupted permanent premolars are visible beneath the eroded deciduous molar in the jaw fragment. The first molar is

completely preserved with all lobes. The tooth is in an early stage of wear and extremely hypsodont.

The enamel is strongly plicated and the plications



Figs. 1-4. *Selenoportax vexillarius*; **1**, PUPC 06/19: a, occlusal view; b, lingual view; c, buccal view. **2**, PUPC 06/15: a, occlusal view; b, lingual view; c, buccal view. **3**, PUPC 06/15: a, occlusal view; b, lingual view; c, buccal view. **4**, PUPC 06/18: a, occlusal view; b, lingual view; c, buccal view. Scale bar 10mm.

are more prominent on the labial side than on the lingual one. The median basal pillar is very well developed, equal in height as the labial lobes and circular in transverse section. The anterior and posterior central cavities are narrow, lacking spurs. The central cavities have no indentations. A prominent anterior transverse flange is present. The anterior and posterior median ribs are well developed. The entostylid and the metastylid are strong. The cement is scattered all over the crown surface. A transverse valley is well developed. The protoconid is crescentic in shape and the lingual

lobes are higher than the buccal ones. The praehypocristid and posthypocristid are not united with the other lobes. The metaconid is pointed in the middle with two narrow and slightly worn sloping cristids running down.

## DISCUSSION

By what is known of its morphology, the studied fossils belong to a large-sized bovid species. To this group belong *Selenoportax* and *Pachyportax* of the Middle Siwaliks. Crown is narrow at the base

and broad at the apex in *Selenoportax* whereas in *Pachyportax* the crown is not constricted at the base. The teeth show all morphological features appear to belong to the Siwalik *Selenoportax*, only known from the late middle Miocene and late Miocene (11.2-5.3 Ma) of the Siwaliks (Barry *et al.*, 2002; Pilbeam *et al.*, 1977; Bibi, 2007). As the length and width measurements of the studied teeth correspond to the genus *Selenoportax* and the crown of the studied specimens are narrow at the base. Two species *S. vexillarius* and *S. lydekkeri* have been found from the Siwaliks. The lack of enough complete collected fossil material the species variability can't be compared, a definite determination is not yet possible on the bases of the studied material; the morphology of the collected remains probably most resembles the *S. vexillarius* however it can't be determined precisely. Therefore the most precise determination what can be given is cf. *Selenoportax*.

#### *Taxonomic status of Selenoportax*

Originally Pilgrim (1937: 756, 758) described two large bovid species *Selenoportax* and *Pachyportax* based on teeth and horn-cores from the continental deposits of the Middle Siwaliks. The features he used to differentiate the genera were tooth shape and size. The resemblance of the teeth assigned to *Selenoportax* and *Pachyportax* to those of Bovini was noted by Pilgrim (1937: 826). According to Bibi (2007) the characters Pilgrim (1937) listed to distinguish between isolated teeth of *Selenoportax* and *Pachyportax*, such as crown flare and enamel folding, are insufficiently diagnostic as such features are entirely variable even within single individuals of living Bovini. In the last 70 years no complete skull with teeth and horn cores has been found from the deposits, which helps us to clarify the taxonomic position of the bovids. For the past 27 years the *Selenoportax* and *Pachyportax* fossils were collected during repeated visits to the Siwaliks by employees and students of the Abu Bakr Fossil Display and Research Centre, Zoology Department, Punjab University, Lahore, Pakistan (e.g. Bakr and Akhtar, 1985; Akhtar, 1992, 1995, 1996; Khan, 2007; Khan *et al.*, 2006). They are stored in the above-mentioned institution. These remains comprise almost more than 500 complete teeth of

the *Selenoportax* and *Pachyportax*. All these teeth have been studied and shelved in published or unpublished form in the above-mentioned institution. The variable feature of the collected material has shown that there is stratigraphical difference between *Selenoportax/Pachyportax* and Bovini. The Bovini is only found from the Upper Siwalik strata while *Selenoportax/Pachyportax* is found from the Middle Siwalik strata. Cementation is very much and median basal pillar is well developed in Bovini observed in the collected remains. However, question remains unresolved and it needs a comprehensive complete fossil material to resolve the historical mystery.

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