



Original Article

New Suid Remains of Genus *Propotamochoerus* from the Siwaliks of PakistanAmir Nadeem^{1,2*}¹Department of Zoology, Government Islamia Graduate College, Civil Lines, Lahore, Pakistan²Department of Zoology, Government College University, Lahore, Pakistan

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ABSTRACT

Siwaliks of Pakistan are highly fossiliferous and are well-known worldwide for vertebrate fossil excavations. **Objective:** To recover some new fossils from different geological formations visible around the village Hasnot of district Jhelum. **Methods:** The targeted area was surveyed, and the different formations around the village were keenly examined by the naked eye or by using a magnifying glass when and where needed. **Results:** New dental remains of the genus *Propotamochoerus* (Mammalia, Suidae) have been found and described from the Middle Miocene Siwalik beds around Hasnot. The material consists of an isolated tooth, the left third mandibular molar. The genus *Propotamochoerus* was comprised of small to large-sized suids. Its remains were reported from the Lower to the Middle Siwaliks. The presently described material, i.e., a lower third molar of the left side, sheds a great deal of light on the fundamental dental characteristics of this genus. **Conclusions:** The recovered material is assigned to the species *Propotamochoerus salinus* (Pilgrim) based on its morphological assessment. This material can potentially enhance the prevalent knowledge of the species reported from the surroundings of the Salt Range of the Siwaliks of Pakistan.

INTRODUCTION

Suids are even-toed ungulates and can be found in large numbers in the Siwalik region of Northern Punjab and other parts of these hills. Beginning in the nineteenth century and continuing onward, numerous scholars [1-6] excavated diverse locations on the hills of the subcontinent, where they found a large number of fossils. Amongst many others, [7-11] are among the most well-known Palaeontological researchers that have conducted studies in this region. Despite this, several other paleontological experts have carried out. A few millennia ago, the family Suidae was among the most ubiquitous families in the Siwaliks of the Indo-Pak region and was represented by a significant number of genera. It was due to the family's ability to

produce many offspring [12-14]. However, even though many species from that time had a significant number of fossil records discovered repeatedly, others had exhibited significantly fewer fossils that represented them. As a result, the discovery of any additional examples of these ancient species is of utmost significance for gaining an accurate comprehension of the part they played and where they stood during the evolution of this particular group. The five component formations, i.e., Soan, Dhok Pathan, Nagri, Chinji, and Kamliyal, are apparent in the region around Hasnot [10].

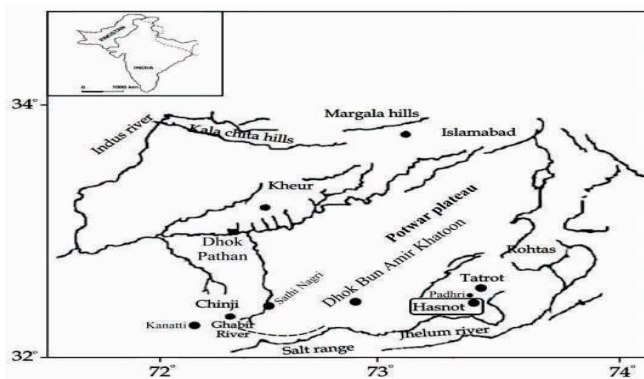


Figure 1: The studied area is highlighted by a map showing different fossil-bearing localities of the Potwar Plateau in Punjab and northern Pakistan [15].

METHODS

The tooth currently being described was gathered in the Nagri Formation in Punjab, Pakistan, in the general region of the Hasnot hamlet. It is currently being stored in the collections of the Palaeontology Laboratory at the Department of Zoology at Government College (now known as GC University) in Lahore, Pakistan. The measurements were taken with a Vernier caliper calibrated in millimeters (mm), and the results were recorded in that unit. The morphometric features of the specimen under investigation are examined. The specimen in question is assigned a serial catalog number, and the figures associated with the specimen represent the year of collection (the denominator) and the serial number (the numerator). For example, Government College Palaeontological Collection Number 367/2001 (where "Government College Palaeontological Collection Number" is abbreviated as "G.C.P.C. No."). The terminology used to describe the parts of the dental crown and the measurement methods are based on [6].

RESULTS

The following results are drawn after the detailed study of the recovered specimen from the study site, which is Hasnot of district Jhelum, Punjab, Pakistan.

Systematic Account:

Order	Artiodactyla	Owen, 1848
Family	Suidae	Gray, 1821
Genus	<i>Propotamochoerus</i>	Pilgrim, 1926
Species	<i>Propotamochoerus salinus</i>	(Pilgrim)

Specimen under study

G.C.P.C. No. 367/2001, an individual third molar located on the left side of the mandible. It was obtained from Hasnot, a region situated in District Jhelum, Punjab, Pakistan.

Description

The morphological description of the material under study is given as under:

Lower Dentition. Third Molar (Fig. 2):

The specimen is an individual third molar located on the left side of the mandible. It was obtained from Hasnot, a region situated in District Jhelum, Punjab, Pakistan. The anterior part of the tooth is damaged; hence, both anterior conids are missing. In its present damaged form, the tooth appears just triangular. It is because of the post-talonid's posterior elongation. The low crown height and height-to-width indices suggest its bunodont and brachyodont type of dentition (Table 1). It is well preserved, yet the anterior and posterior surfaces are only mildly worn. The specimen possesses a thick enamel layer that is shiny and rugose. The cingulum of the lingual side has reached its maximum developmental potential, in contrast to the labial side of the tooth, where it has only reached a partial stage of growth. It is a narrow crowned tooth. When we compared both these conids, the entoconid was vertically higher than the hypoconid of the specimen. The hypoconid is pyramidal, and all three characteristic suid grooves are inconspicuously observable. A robust basal pillar, exhibiting some degree of damage, is upheld by cingular ridges towards the antero-labial side of the hypoconid. The median accessory conulid and the basal pillar are joined to form a continuous structure. The entoconid is higher than the hypoconid. It is pyramidal. It is excellently worn out anteroposteriorly towards the labial side. The entoconid exhibits three distinct suid grooves that are somewhat discernible due to the weathering process. The entoconid is anatomically linked to the front portion of the structure through the median accessory conulid and posteriorly to the posterior conulid. There is a small valley that runs in a longitudinal direction between both the conids, which connects both the posterior and median accessory conulids. Both of these supplementary conulids exhibit an almost flattened morphology due to extensive abrasion. The vertical height of the posterior accessory conulid is notably diminished, and it is upheld by a cingulum that exhibits a frill-like structure and is adorned with many tubercles. The presence of a transverse valley, characterized by its wide opening in both the labial and lingual directions at the post-talonid location, is accompanied by a thin layer of cement filling. In contrast, the longitudinal valley is rather shallow and has a straight configuration. The post-talonid exhibits a visually uncomplicated and round morphology. It has a cingulum and basal pillars that are tuberculated on both the inner and exterior surfaces, except for the back of the post-talonid.



Figure 2: G.C.P.C. No. 367/2001 is an individual third molar located on the left side of the mandible, recovered from Hasnot, District Jhelum, Punjab, Pakistan

Table 1: Measurements (in mm) of the Left Lower Third Molar. G.C.P.C. No. 367/2001 of *Propotamochoerus salinus*.

Preserved anteroposterior crown length	20
Reconstructed anteroposterior crown length	28
Preserved transverse crown width	13.9
Reconstructed transverse crown width	15.5
Preserved crown height	10.3
Reconstructed crown height	10.8
H/W index	69.7
W/L index	55.3
Enamel Thickness	2

DISCUSSION

The specimen under study is G.C.P.C. No. 367/2001, an isolated mandibular tooth of the left side with a multituberculated and multicuspid molar structure, characteristic of the class Mammalia [16]. Mammals can be categorized into two primary classifications, namely egg-laying and placental mammals [17, 18]. The specimen is tetra-cuspid, though the two anterior principal conids are missing due to damage and having a complicated pattern, which means it belongs to some herbivorous eutherian mammal. Among the herbivores, it resembles best with that of Artiodactyla, particularly to pigs belonging to the family Suidae. This conclusion is based on the fact that the specimen has multiple accessory conulid. Therefore, it can not be referred to as the other Primata because the molars are tetra or penta cuspid. The bunodont dentition with crowded conelets also favors its inclusion in the Suidae of Gray [19]. Simpson [20] was the first person who classify family Suidae into five sub-families. These include Hyotheriinae, Listriodontinae, Tetraconodontinae, Sanitheriinae and Suinae. In the sub-families Hyotheriinae and Sanitheriinae, the teeth are complicated, whereas in Listriodontinae are lopohodonts [21, 22]. In the sub-family Tetraconodontinae, the middle cusp of the lower premolars is not bifurcated, whereas it is bifurcated in the family Suinae [4]. The subfamily Suinae has seven genera: *Propotamochoerus*, *Potamochoerus*, *Microstonyx*, *Hippopotamodon*, *Sivahyus*, *Hippohyus*, and *Sus*. In the molars of the genera *Sivahyus*, *Hippohyus*, and *Sus*, each major cusp is produced into two longitudinal parallel

strands [5, 23], whereas in the molar under study, the cusps are rounded and somewhat compressed. These characteristics are present in the *Propotamochoerus*. In *Propotamochoerus*, the molars are bunodont and are of moderate size, as in the case of the present specimen. In the genus *Propotamochoerus*, four species are included, which are *P. salinus*, *P. ingens*, *P. uliginosus*, and *P. hysudricus*. *Propotamochoerus salinus* is a little suid species characterized by the presence of rugose enamel on its molars [5]. *Propotamochoerus hysudricus* is a larger species than *Propotamochoerus salinus* and has complex molars. The molars of *Propotamochoerus uliginosus* show minor differences from *Propotamochoerus salinus*, and according to [5], it is probably synonymous with *Propotamochoerus salinus*. *Propotamochoerus ingens* is much like *Propotamochoerus hysudricus* but relatively much larger. According to [5], it is probably a variant of the species *Propotamochoerus hysudricus*.

CONCLUSIONS

In light of the evidence presented above, it has been determined that the examined specimen belongs to the species *Propotamochoerus salinus* (Pilgrim). This conclusion was reached as a result of the facts listed above.

Authors Contribution

Conceptualization: AN

Methodology: AN

Formal analysis: AN

Writing, review and editing: AN

The author has read and agreed to the published version of the manuscript.

Conflicts of Interest

The author declares no conflict of interest.

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