

NEW AND ADDITIONAL SUIDAE (MAMMALIA)
FROM UPPER SIWALIK SUBGROUP (PLIO-PLEISTOCENE)
OF NORTHWESTERN INDIA

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Key-words: Suidae, Upper Siwalik Subgroup, Pinjor Formation, Upper Pliocene-Middle Pleistocene, Northwestern India.

Riassunto. Dalla Pinjor Formation del sottogruppo Upper Siwalik (Pliocene sup.-Pleistocene medio), affiorante nei pressi di Chandigarh (India sud-occidentale), vengono descritti alcuni Suidi fossili, come *Potamochoerus theobaldi* e *Sus falconeri*, oltre ad una specie di nuova istituzione, *Sus choprai* sp. nov. Questa specie rappresenta uno dei Suidi più grandi e più evoluti del Siwalik e sembra adattata ad un habitat di prateria aperta.

Abstract. A new species of *Sus*, *S. choprai* sp. nov., and some rare and additional fossil suids, viz. *Potamochoerus theobaldi* and *Sus falconeri* are described from Pinjor Formation of Upper Siwaliks of northwestern India. *Sus choprai* sp. nov. was a large and one of the most advanced of the Siwalik suids, showing adaptations to an open country habitat.

Introduction.

The molassic Siwalik deposits of the Indian subcontinent are well-known for their rich vertebrate assemblages, especially the mammals. Since the middle of the nineteenth century, a number of scientific expeditions from different parts of the world have investigated the fossil assemblages and geology of these rocks which range in age from middle Miocene to middle Pleistocene. Upper Siwalik constitutes the youngest Subgroup of the Siwalik Group and ranges in age from upper Pliocene to middle Pleistocene. In the present communication, besides a new species of a fossil suid, a rare, and some additional suids are described from the Pinjor Formation of the Upper Siwaliks exposed near Chandigarh, India. The Upper Siwalik rocks of this area have been worked out from geological and palaeontological viewpoints by a number of scientists. Notable among them are Pilgrim (1926), Colbert (1935), Khan (1962), Sahni & Khan (1964), etc. Among the more recent workers, mention may be made of

Badam (1973, 1979), Nanda (1973), Gaur (1981, 1983, 1986), Gaur & Chopra (1983, 1984a, b), etc.

While collecting data for his doctorate thesis, the author recovered a partial mandible and many teeth of some suids, from the Pinjor deposits exposed in the northeast of Chandigarh, India (Fig. 1). Most of the specimens were

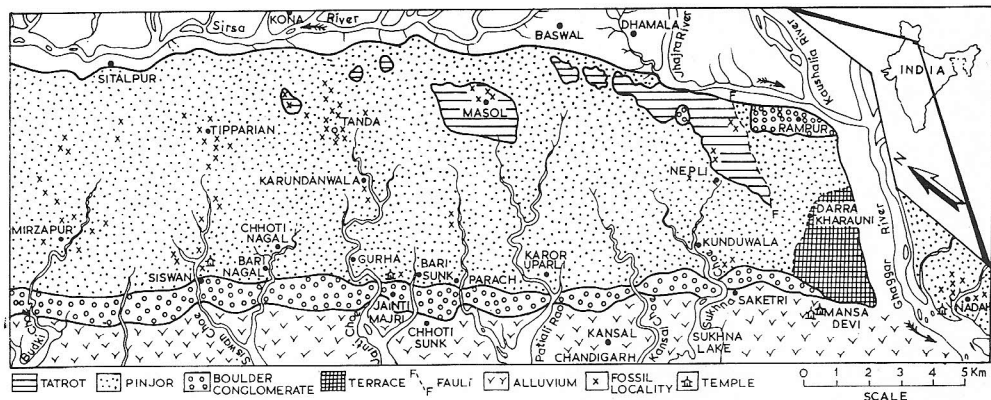


Fig. 1 — Generalised locality map of the area.

recovered *in situ*. These suids were found in association with *Rhinoceros palaeindicus* (Falconer & Cautley), *R. sivalensis* (Falconer & Cautley), *Rucervus simplicidens* (Lydekker), *Sivatherium giganteum* (Falconer & Cautley), *Leptobos falconeri* (Rüttimeyer) and *Elephas hysudricus* Falconer & Cautley. Upper Siwalik deposits in the present area are exposed as low hills with deep gullies, scarps, cuestas, sharp ridges, etc. Clay, silt, sandstone and conglomerate beds of various colours and textures are found in this area. Of the three formations of Upper Siwaliks exposed in this region, Pinjor Formation is the best exposed.

Azzaroli and Napoleone (1982) assigned an age of 3.7 Myr to 0.7 Myr to the Upper Siwalik of this area on the basis of magnetostratigraphy. However, Opdyke et al. (1979) have dated magnetostratigraphically equivalent rocks in Pakistan to 5.5 Myr to 0.6 Myr. According to Opdyke et al. (1979), Azzaroli & Napoleone (1982), and Tandon et al. (1984), the Tatrot/Pinjor boundary corresponds with the Gauss/Matuyama transition, which has been dated to about 2.5 Myr.

Systematic description

Family *Suidae* Gray, 1821

Subfamily *Suinae* Zittel, 1893

Genus *Potamochoerus* Gray, 1854**Potamochoerus theobaldi** Pilgrim, 1926

Pl. 12, fig. 1, 2

Holotype. Ind. Mus. B11, a right mandibular ramus with $P_4 - M_3$.

Horizon. Upper Siwalik, probably in the upper part of Pinjor or even Boulder Conglomerate Formation.

Locality. Gagret, Kangra District (H.P.).

Additional material. PUA 84/5, a left P_4 and PUA 78/54, a left mandibular fragment with M_2 and M_3 .

Horizon. Pinjor Formation of Upper Siwaliks.

Locality. PUA 84/5, about 1.25 km northeast of Moginand; PUA 78/54, about 1 km northeast of Tanda.

Description.*P₄* (PUA 84/5).

This tooth (Pl. 12, fig. 1) is high-crowned and tapers from the base to the top. The main central cuspid is very prominent and does not show any sign of bifurcation at the top. The anterior accessory cuspid is smaller and less developed than the posterior accessory cuspid. Both the accessory cuspids lie at a lower level than the main central cuspid. In this respect it differs from the P_4 of *Sus* and *Dicoryphochoerus* in which the front and the hind portions of the tooth are as high as the main central cuspid and the lateral view of the tooth shows four or more cuspids of equal strength forming a straight line. The posterior accessory cuspid of this premolar is demarcated from the main central cuspid by lingual and buccal depressions. The posterior accessory cuspid also shows small tubercles, one each on its buccal and lingual sides, the lingual one being stronger and higher than the buccal one. Pressure facets can be seen on the mesial and distal sides of the tooth which shows slight wear.

(PUA 78/54).

This specimen (Pl. 12, fig. 2) preserves the alveolar portion of the left ramus holding M_2 and M_3 .

M₂.

The second molar is roughly rectangular in outline. The paraconid is broken mesio-lingually and the enamel on the mesio-buccal margin of the protoconid is slightly chipped. The median valley is occupied by a prominent median valley conulid. The addition of a conid in its distalmost part has given an elongated appearance to the molar. The tooth enamel is moderately thick.

M_3 .

The third molar is elongated in shape; its length greatly exceeds its breadth. Its crown height is lesser than that of *Sus falconeri*. The tip of the paraconid is slightly broken. The metaconid is strong while the hypoconid is comparatively low. The median valley conulid is nearly flat. The buccal opening of the median valley is blocked by a small tubercle. Mesially, the tooth shows a shelf-like anterior cingulum which starts at the mesio-buccal border of protoconid and proceeds lingually to terminate at the mesio-lingual margin of the paraconid. On the mesio-lingual margin, a small but prominent conule can be seen, arising from the anterior cingulum, at the base of paraconid.

The talonid displays many accessory cusplids. The hypoconulid is small and relatively less developed. Just mesial to the hypoconulid, two transversely placed, well-developed but blunt accessory tubercles can be differentiated. The valley between these accessory tubercles and the distal transverse row of major conids, i.e., hypoconid and metaconid, is occupied by a posterior median valley conulid. Small lingual and buccal accessory conulids block the median valley of the talonid.

Remarks. The present specimen forms the first record of *Potamochoerus theobaldi* from the Pinjor Formation of this area and the second from the Indian Siwalik. The only other report of this form is from Gagret, Kangra District (H.P.), from where the holotype was recovered (Pilgrim, 1926, p. 27).

There is not much difference between *Potamochoerus palaeindicus* and *Potamochoerus theobaldi*. Both these species are known by insufficient material. It is possible that these two are the variants of single species. The present material is insufficient to suggest the merger of these two species. However, the recovery of more complete and better material in future may help to sort out this problem. For the time being separate specific positions have been maintained here for *P. palaeindicus* and *P. theobaldi*.

Genus *Sus* Linnaeus, 1758

Type species: *Sus scrofa* Linnaeus, 1758

Sus falconeri Lydekker, 1884

Pl. 12, fig. 3; Pl. 13, fig. 4, 5

Holotype. Brit. Mus. No. 16386, a skull (catalogued by Lydekker, 1885, as No. 15386).

Horizon. Upper Siwalik.

Locality. Siwalik Hills.

Additional material. PUA 77/39, a left M_3 .

Horizon. Pinjor Formation of Upper Siwaliks.

Locality. About 1.5 km northeast of Tanda.

Referred material.

PUA 79/5, a partial left M^3 recovered from Pinjor Formation about 0.5 km north of Nadah (Pl. 13, fig. 4).

PUA 84/6, a left M_3 recovered from Pinjor Formation exposed in the east of Moginand (Pl. 13, fig. 5).

Description.

M_3 (PUA 77/39).

The present molar (Pl. 12, fig. 3) is roughly triangular in shape with its apex towards the distal side and somewhat elongated, longer than the M_3 of *Potamochoerus* (Table 1). A part of the ramus is attached on the lateral side of

S.No. Measurements	<i>Sus choprai</i> sp. nov. PUA 78/26 present specimen		<i>Sus falconeri</i> Lydekker, 1884, p. 73			PUA 77/39	<i>Sus hyudricus</i> Lydekker, 1884, p. 80 (F.A.S., pl. 70, fig. 3, 3a)			<i>Potamochoerus theobaldi</i> PUA 78/54			PUA 84/5	Pilgrim*, 1926, pl. 10, fig. 3, Ind. Mus., No. B 11	<i>Potamochoerus</i> <i>palainidicus</i> Pilgrim*, 1926, pl. 10, fig. 2, Ind. Mus., B 691
	Lydekker, 1884, pl. 7, fig. 1, Dub. Mus., No. 27	Lydekker, 1884, p. 73	Lydekker, 1884, p. 73	Lydekker, 1884, p. 80, pl. 8, fig. 3	Lydekker, 1884, p. 80 (F.A.S., pl. 71, fig. 10)		PUA 78/54	PUA 78/54	PUA 78/54						
1. Max. mesio-distal dia. of P_2-M_3	124.50	129.00*	—	—	—	—	123.95	—	—	—	—	—	—	—	—
2. Max. mesio-distal dia. of P_3-M_2	59.00	71.40*	75.19	—	—	—	71.00	—	—	—	—	—	—	—	—
3. Max. mesio-distal dia. of M_1-M_2	34.00	42.00*	45.04	39.37	—	—	40.00	32.76	30.48	—	—	—	—	—	—
4. Max. mesio-distal dia. of P_2	8.00	10.25	—	—	—	—	—	—	—	—	—	—	—	—	—
5. Max. bucco-lingual dia. of P_2	7.20	6.20*	—	—	—	—	—	—	—	—	—	—	—	—	—
6. Index	90.00	60.49	—	—	—	—	—	—	—	—	—	—	—	—	—
7. Max. mesio-distal dia. of P_3	13.50	14.40*	—	—	—	—	14.98	16.51	—	—	—	—	—	16.5	19.5
8. Max. bucco-lingual dia. of P_3	9.60	9.10*	—	—	—	—	7.62	11.17	—	—	—	—	—	12.5	13.5
9. Index	71.11	63.19	—	—	—	—	50.87	67.66	—	—	—	—	—	75.7	69.2
10. Max. mesio-distal dia. of P_4	13.70	14.10*	—	—	—	—	17.52	15.75	12.70	—	—	18.0	—	18.0	19.5
11. Max. bucco-lingual dia. of P_4	11.50	11.30*	—	—	—	—	10.92	12.70	8.89	—	—	13.0	—	14.0	15.0
12. Index	83.94	80.14	—	—	—	—	62.33	80.63	70.00	—	—	72.0	—	77.7	76.9
13. Max. mesio-distal dia. of M_1	16.00	15.00*	—	12.70	—	—	20.32	16.25	12.70	—	—	—	—	19.5	16.5
14. Max. bucco-lingual dia. of M_1	17.50	13.90*	—	14.47	—	—	—	12.19	10.16	—	—	—	—	16.5	13.5
15. Index	106.25	92.67	—	87.77	—	—	—	73.79	80.00	—	—	—	—	84.6	81.8
16. Max. mesio-distal dia. of M_2	19.30	27.94	27.43	25.67	—	—	23.36	21.33	16.76	30.0	—	—	—	28.0	26.0
17. Max. bucco-lingual dia. of M_2	20.00	17.78	18.28	17.52	—	—	—	16.51	12.70	19.00	—	—	—	21.5	19.0
18. Index	103.63	63.64	66.64	66.69	—	—	—	77.40	75.78	66.00	—	—	—	77.0	73.0
19. Max. mesio-distal dia. of M_3	56.10	49.53	51.81	49.27	62.00	—	35.29	34.29	25.40	50.0	—	—	—	47.0	41.0
20. Max. bucco-lingual dia. of M_3	20.60	19.20	21.84	19.30	22.00	—	—	17.78	12.70	23.5	—	—	—	23.5	21.0
21. Index	36.72	38.97	41.15	39.17	35.80	—	—	51.85	50.00	47.00	—	—	—	49.0	51.0
22. Thickness of enamel of M_3	2.30	1.65	—	—	—	—	—	—	—	—	—	—	—	—	—

* Calculated from figure.

Tab. 1 — Comparative measurements (in mm) of mandibular dentition of some Upper Siwalik suids.

the tooth. This high-crowned tooth presents a complex pattern of conids, conulids, accessory tubercles and valleys. The conids are arranged into three longitudinal rows of conids.

Paraconid is the most prominent conid and projects higher than the other three conids. The anterior cingulum is slightly beaded and starts at the mesio-buccal margin of protoconid, travels lingually and terminates below paraconid. Some cingular development can also be demarcated on the buccal side of the base of the hypoconid. The mesial side of the molar exhibits a small pressure facet. The median valley is occupied by a median accessory tubercle. The valley is obstructed on the buccal side by a small median valley conulid.

The talonid is much elongated and besides many small accessory tubercles shows two transverse rows of three conids each, two lateral and one median. The distalmost part of the talonid is occupied by a well-developed hypoconulid. A small tubercle can be seen arising from the basal cingulum on the lingual side of hypoconulid. Except slight wear on the protoconid, the molar shows almost no wear.

Remarks. *Sus falconeri* was a large and specialized suid. Its M_3 is elongated with the addition of a transverse row of accessory conids. It differs from *Potamochoerus* and *Sus* species by its longer and complicated M_3 . Colbert (1935) considered *S. falconeri* to be on a line leading to African wart hog. However, the reduction of the teeth anterior to M_3 , which is so typical of wart hog, is absent in *S. falconeri*.

***Sus choprai* sp. nov.**

Pl. 13, fig. 6; Text—fig. 2, 3

Holotype. PUA 78/26, a partial mandible with left P_2 — M_3 , symphysis, and roots of canines, lateral incisors and central incisors (Pl. 13, fig. 6).

Horizon. Pinjor Formation of Upper Siwaliks.

Locality. About 3.5 km northeast of Mirzapur Village.

Age. Lower Pleistocene, approximately 1.5 Myr B.P.

Repository. The specimen is catalogued in the Anthropology Department, Panjab University, Chandigarh under catalogue number PUA 78/26.

Etymology. The species has been named in honour of Prof. S.R.K. Chopra, Vice-Chancellor Kurukshetra University, Kurukshetra, India.

Diagnosis. A large species with relatively high crowned cheek-teeth. I_3 — C_1 — P_4 — M_3 . Symphysis long and heavy, extending backwards up to the mesial border of P_3 . M_1 and M_2 comparatively short; M_3 much elongated with a very complex talonid and a prominent disto-buccal cingulum. Last molar longer than the combined length of P_4 , M_1 and M_2 . The lateral view of the talonid gives the appearance of closely spaced columns.

Description.

PUA 78/26.

The present mandibular fragment (Pl. 13, fig. 6) preserves the left horizontal ramus with P_2 to M_3 and the symphysis, the anterior part of which is broken. The ramus is broken just distal to M_3 . The symphysis slopes downwards and backwards showing a convex mental surface and a highly concave lingual surface. Posteriorly, the symphysis joins with the horizontal ramus at the level of P_2 . The horizontal ramus is robust and deepest below M_2 . The maximum thickness is observed at the level of the mesial part of M_3 . The

lateral surface of the body is strongly convex mesiodistally as well as vertically. There are two mental foramina on the later surface of the ramus; the one anterior to P_2 is slightly bigger than the one at the level of M_1 and travels posteriorly becoming broader and shallower in the process. The lingual surface of the horizontal ramus is nearly flat, except near the distal end of M_3 where it bends slightly towards the lateral side. The alveolar border of the ramus, which is narrow anteriorly and comparatively wide posteriorly, follows roughly the axis of the ramus.

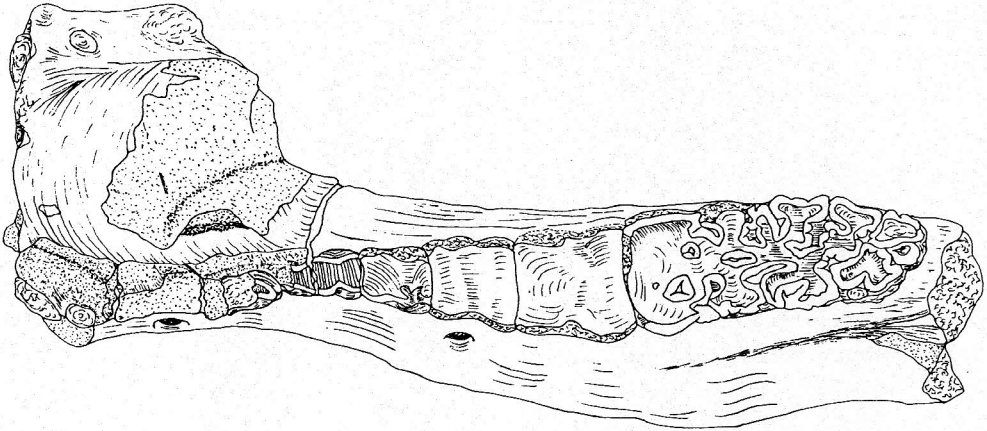


Fig. 2 – Occlusal aspect of *Sus choprai* sp. nov.

Anteriorly, the broken symphysis depicts nearly circular roots of the first and second incisors. The roots of the lateral incisors are not discernable; probably the symphysis broke posterior to the distalmost end of their roots. From the cross-section of their roots the canines appear moderately large and of verrucose type.

P_2 .

Most of the second premolar is broken; it preserves only a small posterior secondary cuspid. However, from the alveolus which holds its root, the outline of the tooth appears to be oval.

P_3 .

It is more or less triangular in shape with its apex towards the mesial side. It is larger than P_2 . The major portion of the crown is constituted by a very prominent main central cuspid which is preceded by a small anterior accessory cuspid. The distalmost part of the tooth has a moderately large posterior accessory cuspid which is demarcated from the main central cuspid by lingual and buccal depressions. The premolar shows moderate wear.

P_4 .

The fourth premolar which is roughly rectangular in outline is the largest tooth of the premolar series. It is slightly chipped along its lingual border. Despite wear, four distinct cuspids can be differentiated on its buccal aspect. The principal central cuspid which lies distal to a comparatively small anterior secondary cuspid is the most prominent cuspid of the crown. A narrow depression demarcates the anterior secondary cuspid from the principal cuspid along the buccal margin of the premolar. Distal to the principal cuspid, the crown shows two posterior secondary cuspids, the mesial one of these two cuspids is placed near the middle of the crown. Partly due to wear and partly due to the damage to the tooth, the structures on the lingual side of the premolar are indistinct. It is implanted in the mandible by two deep roots.

M_1 .

The first molar is roughly rectangular and it is worn to such a great extent that all the morphological features of the crown are obliterated leaving behind only the dentine. All the major conids, viz. mesio-lingual paraconid, mesio-buccal protoconid, distolingual metaconid and disto-buccal hypoconid have disappeared due to heavy attrition, giving the crown a flattened surface. Bucco-lingual diameter of the tooth is less at its mesial end than at its distal end. The molar is implanted in the mandible by four moderately deep roots.

M_2 .

It is a more or less squarish tooth and shows features similar to M_1 , except that it is comparatively larger and its mesial and distal transverse diameters are almost equal. As in M_1 , the enamel on the occlusal surface has been completely eroded by excessive wear.

M_3 .

The third molar is very much elongated and exhibits a very complex crown pattern. The mesio-distal diameter of the molar is greater than even the combined length of P_4 , M_1 and M_2 . The occlusal surface of the tooth can be divided into a mesial and a distal part.

The mesial part of the tooth displays a mesio-lingual paraconid, mesio-buccal protoconid, disto-lingual metaconid and a disto-buccal hypoconid. Due to excessive wear, the enamel in this half of the molar has been reduced to small enamel islands. The median accessory tubercle can not be distinguished. The enamel at mesial border of the tooth has probably been eroded due to interstitial wear.

The distal part of the tooth, or the talonid, is very complicated and much longer than the mesial part. The mesial portion of the talonid shows a pair of equally pronounced tubercles, viz., the anterior accessory tubercle—I and an

terior accessory tubercle—II. Both these tubercles seem to be as pronounced as the two conids mesial to them. Distal to these tubercles there is another pair of posterior accessory tubercles—I and II; the posterior accessory tubercle—I is larger than its lingual counterpart and shows a small accessory conule just lingual to it. The distal—most portion of the talonid is occupied by a well—developed hypoconulid which displays yet another accessory tubercle on its disto—buccal side. When viewed from the lateral side, the molar gives the impression of closely spaced columns. The disto—buccal aspect of the talonid exhibits a strong cingulum which starts prominently at the base of the anterior part of the posterior accessory tubercle—I and travels distally terminating at the base of the hypoconulid. The enamel of the tooth is comparatively thick and smooth.

Comparisons. The Upper Siwaliks of India are represented by a number of suid genera, namely *Sivachoerus*, *Tetraconodon*, *Dicoryphochoerus*, *Potamochoerus*, *Hippohyus* and *Sus*. The present specimen differs from *Sivachoerus* and *Tetraconodon* in which the posterior premolars are greatly enlarged and the talonid of the last molar is poorly developed. It can be differentiated from *Dicoryphochoerus* by the great elongation of the talonid of M_3 . Genus *Dicoryphochoerus* is characterized by the presence of two closely appressed cones on the fourth premolar, comparatively short teeth, and relatively simple talonid on M_3 .

The present specimen clearly differs from *Potamochoerus* in the structure of its fourth premolar and the last molar. The P_4 in *Potamochoerus* exhibits only a single cusp when viewed from the lateral side. The specimen under discussion displays four cusps on P_4 , as is the case with *Hippohyus* and *Sus*. It further differs from *Potamochoerus* in the complexity of the crown of M_3 , which possesses a very long talonid. In *Potamochoerus*, M_3 is relatively simple and the talonid is comparatively short.

The genus *Hippohyus* is characterized by molars with a very complex enamel pattern and a comparatively small third molar. The present specimen can be clearly distinguished from *Hippohyus*, as it lacks the complex enamel pattern of *Hippohyus* and its last molar is much longer and intricate than the corresponding tooth of *Hippohyus*. In its morphological details the present specimen is similar to *Sus*.

Pilgrim (1926) proposed three new species of the genus *Sus*, viz., *S. peregrinus*, *S. bakeri* and *S. cautleyi*, from the Upper Siwaliks. Present mandible differs from *S. peregrinus* in its overall larger size. Besides this, unlike the present specimen, the cheek teeth in *S. peregrinus* are slender and simple. The cusp pattern and the talonid of M_3 of the mandibular fragment under discussion are very much different from that of *S. bakeri* which is characterized by molars with simple cusps and a simple talonid on M_3 . In the present case, M_3 exhibits

complicated cusp pattern and a long and complex talonid.

Sus cautleyi was erected on the basis of maxillary teeth. Since only the mandibular dentition is available in the present specimen, it is not possible to compare it with *Sus cautleyi*. However, the present specimen differs from *S. cautleyi* in the size of second molar which is shorter than the maxillary second molar of *Sus cautleyi*. Although, M_2 of *S. cautleyi* is not available for comparison, in all probability it must have been longer than M_2 of the present specimen, as the lower molars in suids are usually longer than the corresponding upper molars. The specimen under discussion differs from *Sus hysudricus* in its complex M_3 with a very long and complicated talonid. It further differs from *S. hysudricus* in the shortening of posterior premolar and molar series except M_3 . A plot of the maximum length of M_3 against the combined length of some Upper Siwalik suids is presented in Figure 3.

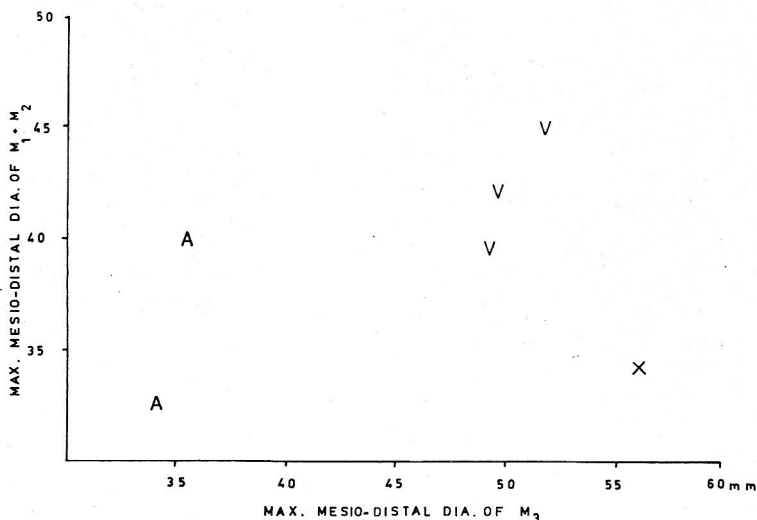


Fig. 3 — Scatter diagram of mesio-distal diameter of M_3 drawn against the same of $M_1 + M_2$ of some Siwalik *Sus* species. A) *Sus hysudricus* Falconer & Cautley; X) *Sus choprai* sp. nov.; V) *Sus falconeri* Lydekker.

Prasad (1970) reported a partial suid mandible with deeply worn M_1 and M_2 , and a very badly preserved M_3 , from the Tatrot Formation of Haritalyangar, India. He assigned the above specimen (G.S.I. 18084) to a new species, *Sus tatroti*. The specimen does not preserve many parts of the dentition, i.e., canines, P_4 , and a well preserved M_3 , on which the proper identification of suids so heavily depends. So, it is very difficult to make meaningful comparison of Prasad's specimen with other Siwalik suid species. In the absence of P_4 and a well-preserved M_3 even the generic identification cannot be made with certainty. Therefore, the creation of a new species is not justified, especially in view

of the fact that most of these characters, such as long and heavy symphysis, large mental foramen, and robust mandible, etc., are shared with slight variations by many Upper Siwalik suids. At best, Prasad's specimen could be compared metrically to some extent with *Sus falconeri*. It seems that Prasad's specimen is a slightly smaller specimen of *Sus falconeri*.

The present mandible (PUA 78/26) differs from *Sus falconeri* by its relatively short P_4 . Also, the M_1 and M_2 of the present specimen are roughly squarish and they differ from the same of *Sus falconeri* in their shorter length and greater breadth. The most pronounced difference of the present mandible and *Sus falconeri* lies in the greater length and complexity of M_3 in the former. The present specimen is characterized by the shortening of its P_4 , M_1 and M_2 . Mesio-distal diameter of its M_3 , which has greatly increased in length, is considerably greater than the combined length of P_4 , M_1 and M_2 , and nearly approaches the united length of P_3 to M_2 . In the case of *Sus falconeri* the length of M_3 is only slightly more than the united length of M_1 and M_2 , as is evident in the scatter diagram (Fig. 3). In other words the reduction in the length of P_4 and molars mesial to M_3 is much more in the present specimen than in *Sus falconeri*. The present specimen can be further distinguished from *Sus falconeri* by the presence of a prominent cingulum at the disto-buccal border of M_3 and in having a comparatively thick (2.3 mm) enamel on the molars. Thus, keeping in view its morphological and metrical differences with other suid taxa known from the Upper Siwaliks, the present specimen has been assigned here to a new species of *Sus*, viz., *Sus choprai*.

Remarks. During the middle and later portion of the Tertiary, Indian sub-continent was a great center of adaptive radiation of *Suidae* (Colbert, 1935), as is indicated by the great variety and large number of suid taxa reported from the Siwalik deposits of north India and Pakistan. Some of the modern suid genera, such as *Sus* and *Potamochoerus*, are represented in the Siwalik. Of the living suids, *Phacochoerus* (the African wart hog) is the most specialised in the characters of its dentition, e.g. a greatly elongated, complex and hypsodont M_3 , and the reduction in the cheek teeth mesial to M_3 . On the basis of dentition and other characters, Colbert (1935) established a link between *Phacochoerus* and the Siwalik suid, *Sus falconeri*. According to Colbert (1935), *Sus falconeri* seemed to be more or less in a direct line leading to *Phacochoerus*.

The present form (PUA 78/26) seems to have evolved a step further towards wart hog like characters than *Sus falconeri*. In the present form M_3 has further elongated with the addition of two to three transverse rows of cusplids in the talonid. Moreover, the reduced length of P_4 , M_1 and M_2 in *Sus choprai* is also a step towards the phacochoerid condition of extreme reduction of cheek teeth mesial to M_3 . This reduction is hardly noticeable in *Sus falconeri*. There-

fore, *Sus choprai* represents a form more specialized than *Sus falconeri*. It shows some morphological similarities with *Metridiochoerus andrewsi* (White & Harris, 1977; fig. 3c) from the Pleistocene of East Africa and Koobi Fora.

As pointed out by Gaur and Chopra (1984a), the environment during the Pinjor deposition became arid and grasslands appeared. The elongation and complexity of M_3 and the corresponding reduction in lengths of M_1 and M_2 of *Sus choprai* resulted probably in response to this changed environmental situation. This form probably partially supplemented its diet with grasses which could have been ably sustained by a relatively thick enameled, and a long, complex and high crowned last molar.

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PLATE 12

Fig. 1, 2 — *Potamochoerus theobaldi* Pilgrim, 1926.

1a) Occlusal; 1b) buccal; 1c) lingual views of left P_4 (PUA 84/5).

2a) Occlusal; 2b) buccal; 2c) lingual view of left $M_2 + M_3$ (PUA 78/54).

Fig. 3 — *Sus falconeri* Lydekker, 1884.

3a) Occlusal; 3b) buccal; 3c) lingual views of left M_3 (PUA 77/39).

Bar represents 2 cm.



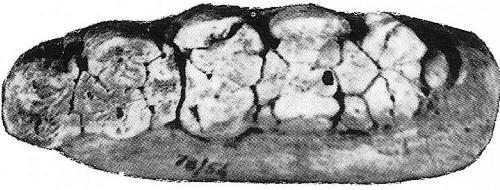
1a



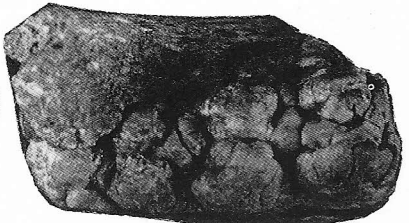
1b



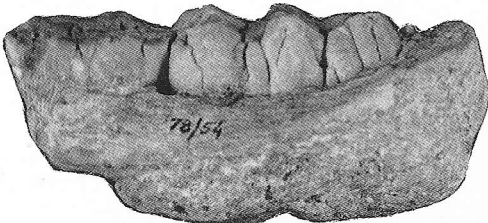
1c



2a



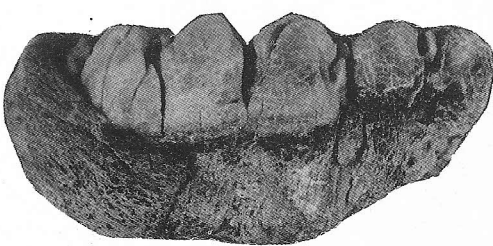
3a



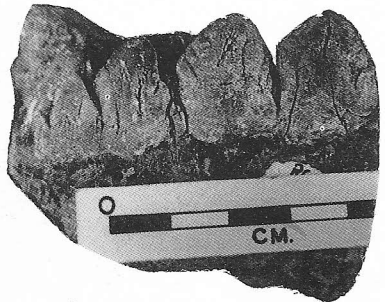
2b



3b



2c



3c

PLATE 13

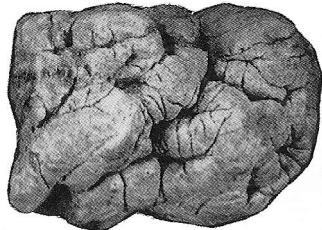
Fig. 4, 5 — *Sus falconeri* Lydekker, 1884.

4a) Occlusal; 4b) buccal; 4c) lingual views of a partial left M^3 (PUA 79/5).
5a) Occlusal; 5b) buccal; 5c) lingual views of left M_3 (PUA 84/6).

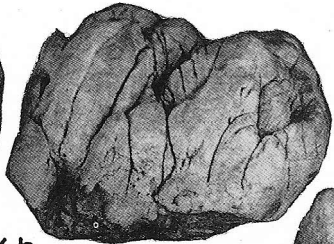
Fig. 6 — *Sus choprai* sp. nov. Holotype.

6a) Occlusal; 6b) buccal; 6c) lingual views of the mandible (PUA 78/26).

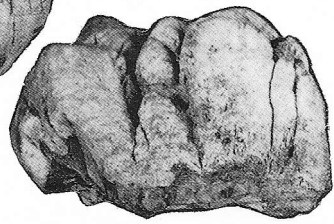
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4a



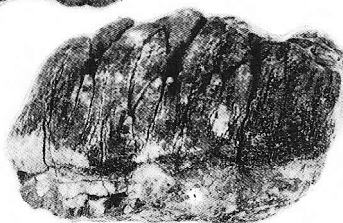
4b



4c



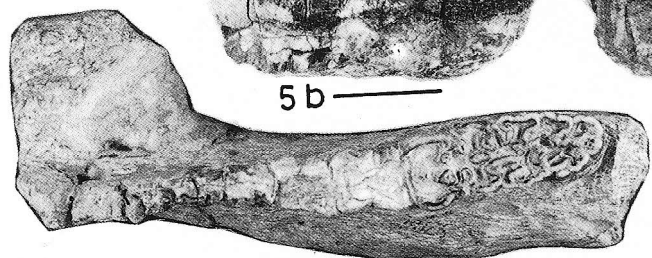
5a



5b



5c



6a



6b



6c