

## NEW FOSSIL FORMS OF RHINOCEROTIDAE AND SUIDAE FROM PINJOR BEDS (LOWER PLEISTOCENE) NEAR CHANDIGARH

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ABSTRACT—Two new species viz. *Rhinoceros barinagalensis* and *Dicoryphochoerus sahnii* based on mandibles of Rhinocerotidae and Suidae, are described.

### INTRODUCTION

During the course of geological mapping in the area north and east of Chandigarh, one of the authors (B. C. Verma) made a large collection of vertebrate fossils. These were jointly studied in the Palaeontological Laboratory of the Geological Survey of India, Northern Region, Lucknow, by the authors. The paper incorporates the following two new forms:

Mandible of *Rhinoceros barinagalensis* sp. nov.

Mandible of *Dicoryphochoerus sahnii* sp. nov.

### GEOLOGY

The area under study is occupied by the Upper Siwaliks—divisible into four well differentiated stages (Sahni and Khan, 1959) based on lithology and fauna. The following stratigraphic succession is observed:

Alluvium—Gravels and  
*Dun* deposits .. Holocene

Ghaggar river terraces ...	Upper Pleistocene
Upper Boulder Conglomerate	... Middle Pleistocene
Lower Boulder Conglomerate	} Lower Pleistocene
Pinjor	
Tatrot	... Upper Pliocene ?
----- Base not seen -----	

The Tatrot stage in the area forms the lower most part of the succession. It consists mainly of regularly banded, alternating layers of grey and dull grey fine-grained sandstones and variegated clays of red, pink, grey, dull grey and yellow colours. They are exposed in sunken reliefs of eroded domes except for the large longitudinal outcrop, over three kilometres long and two kilometres wide and extending from Kholtaandoo to Basaulan villages.

The Tatrot stage (with a prominent horizon of thick grey sandstone at the top)

conformably grades into thick strata of interbedded clay and sandstones of the Pinjor stage which derives its name from the town of Pinjor (now spelt Pinjaur) lying in the vicinity. Due to flat dips the formation occupies a large area, but it does not seem to be more than 600 metres in thickness.

The Pinjor rocks pass upwards conformably into the Lower Boulder Conglomerates with interbedded dull grey and red soft sandstones and pink clays. The stage is characterised by the prominence of conglomeratic bands rather than soft sandstones as in the Pinjor stage.

The Upper Boulder Conglomerates are lying horizontally at the top of the hill 1933, which is situated about a kilometre west of Surajpur Cement Works and is the only outcrop representing this stage in this area.

#### SYSTEMATIC DESCRIPTION

Family Rhinocerotidae

Genus *Rhinoceros* s. str. Gray

*Rhinoceros barinagalensis* sp. nov.

Plate 1

*Description and state of preservation.* The two outer large incisors have weathered away, but their impressions are present. Of the inner pair of incisors, the right one is not seen, but the left one is seen in half-broken condition.

In each ramus there are three premolars as are expected in *Rhinoceros* s. str. According to Lydekker, (1881 p.8), there should be three molars on each side but *Rhinoceros* s. str. Gray is known to have only three molars and three premolars (Zittel, 1925).

In the right ramus the first two molars are well preserved and the third is slightly split vertically from the outer side and is more or less half preserved. All the molars are in a well worn condition and indicate a mature adult individual. The three premolars are present, but are weathered near the projected portions, and only the embedded parts are preserved. It may be possible to reconstruct the entire surface from the embedded outline.

The dentition of the left ramus is comparatively much more weathered, and all the three molars are broken leaving behind only the embedded parts. Of the three premolars, the first one is more or less complete, the second one is partially broken from its sides, while the third one is missing.

*Discussion.* In none of the earlier works there is any description of a complete lower jaw of *Rhinoceros palaeindicus* Falconer and Cautley (to which our specimen shows some resemblance) though a number of specimens from Punjab and other areas (apparently from the Siwaliks) have been figured and described by Falconer and Cautley (1845—49) and Lydekker. Most of the figures in their works are of crania, upper molar series, parts of rami and few detached symphyses.

Lydekker (1881) in his memoir on the "Siwalik Rhinocerotidae" elaborately discussed the works of Falconer and Cautley. According to him (1881, p. 47), the specimens of the mandibles figured in plate 72 fig. 4 and plate 75 fig. 10 of the "Fauna Antiqua Sivalensis" and the name *Rhinoceros platyrhinus* belong to the species *R. palaeindicus* F. & C. The molar series of

the right ramus of the present specimen has some resemblance to that of the specimen figured in "F.A.S." Pl. 75, fig. 10, but the exceptionally large size of the fourth premolar in the latter and large dimensions of the other cheek teeth (Table 1) in the former are characters which, in the opinion of the present authors specific distinctions between the two.

According to Lydekker (1881, p. 37), the symphysis forms the only reliable basis of distinction among the various species of *Rhinoceros*. The symphysis of the present specimen is in a fairly well preserved condition, but the two outer incisors are missing and only one of the two inner incisors is

present. If, from the position of this preserved incisor, the presence of the other inner incisor is accepted, the specimen could be assigned to *Rhinoceros palaeindicus* F. & C. However, Lydekker (1881, p. 37) remarked that the symphysis of *R. palaeindicus* slopes regularly from back front, whereas in the present specimen it slopes from back to front in the anterior portion and from front to back in the posterior portion, this character being similar to *R. platyrhinus* F. & C. On the basis of this character alone, the present specimens cannot be referred to *R. platyrhinus* F. & C. These are no supporting data either from the incisors or from molar series. The authors, therefore propose to assign this specimen to a new species of the *Rhinoceros*.

TABLE 1

## COMPARATIVE MEASUREMENTS

	<i>R. palaeindicus</i> F. & C.			<i>R. barinagalensis</i> sp. nov.		
Length of the 2nd premolar	...	0.7	inches (18.5 mm)	0.6	inches (15.2 mm)	
Length of the 3rd premolar	...	1.4	„ (35.56 mm)	1.5	„ (38.1 mm)	
Length of the 4th premolar	...	1.65	„ (41.9 mm)	1.5	„ (38.1 mm)	
Length of the 1st true molar	...	1.46	„ (37 mm)	1.9	„ (48.2 mm)	
Length of the 2nd molar	...	2.0	„ (50.8 mm)	2.45	„ (62.2 mm)	
Width of the 2nd premolar	...	0.45	„ (11.4 mm)	0.6	„ (15.2 mm)	
Width of the 3rd premolar	...	0.85	„ (21.5 mm)	1.1	„ (28 mm)	
Width of the 4th premolar	...	1.1	„ (28 mm)	1.3	„ (33 mm)	
Width of the 1st true molar	...	1.05	„ (26.5 mm)	1.3	„ (33 mm)	
Width of the 2nd molar	...	1.2	„ (30.5 mm)	1.35	„ (34.3 mm)	

## EXPLANATION OF PLATE 1

*Rhinoceros barinagalensis* sp. nov.

Dorsal view of the mandible (Nearly natural size).

Specimen No. G. S. I. Type 18674.



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A



B

TABLE 1—(Contd.)

Other dimensions of *R. barinagalensis* sp. nov.

Length of the left molar and premolar series (excluding the last molar)	..	238	mm
Length of the right molar and premolar series (excluding the 3rd premolar)	..	270	mm
Maximum width of the symphysis	.. ..	150	mm
Length of the symphysis	.. ..	210	mm (Approx.)
Height of the ramus at right M <sub>3</sub>	.. ..	180	mm
Height of the ramus at right PM <sub>1</sub>	.. ..	90	mm
Length of M <sub>3</sub> (dext.)	.. ..	61	mm
Maximum width of M <sub>3</sub> (dext.)	.. ..	28	mm

*Locality.* About three kilometres north of Bari Nagal village, Tehsil Kharar, Distt. Rupar, Punjab.

*Horizon.* Pinjor stage.

*Repository.* G. S. I. Type 18674.

Family Suidae

Genus *Dicoryphochoerus* Pilgrim 1926

*Dicoryphochoerus sahnii* sp. nov.

Plate 2 & 3

*Description and state of preservation.* The specimen represents the mandible with complete symphysis, left ramus and the anterior half of the right ramus. The cheek-teeth of

the left ramus, except for the first premolar, and all the four premolars of the right ramus, are perfectly preserved. The left canine is complete except for the broken tip, while the right canine has only the root remnant preserved. Only five of the six incisors are preserved, of which the two right ones are broken off at the middle. There is no trace of the sixth incisor, i.e. the 3rd on the left side.

The upper (coronal) surface of the mandible is well preserved, but the lower surface is obscured by the surrounding matrix which can not possibly be removed without damaging the entire specimen.

## EXPLANATION OF PLATE 2

*Dicoryphochoerus sahnii* sp. nov.

A. Dorsal view of the mandible (x1/3). B. Lateral view of the mandible, left side (x1/3).

*Specimen No.* G.S.I. Type 18675

TABLE 2

**DIMENSIONS***(in millimetres)*

## Premolars

	PM <sub>1</sub>		PM <sub>2</sub>		PM <sub>3</sub>		PM <sub>4</sub>	
	R	L	R	L	R	L	R	L
Length	10	—	13	13	14.5	16	17.5	16.5
Maximum width at the surface	4	—	5	5	7	7	10	9

## Left Molars

	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>
Length	17	27	51
Maximum width	13	16	18
Height on the internal side	—	10	18
Height on the external side	—	7	12

## Others

Length of the symphysis	..	80
Width of the symphysis (from left to right canine, from their internal sides)	..	54
Width of the symphysis (from left to right 2nd premolars)	..	39
Width of the ramus near the anterior side of third molar	..	37

## EXPLANATION OF PLATE 3

*Dicoryphochoerus sahnii* sp. nov.

Ventral view of the mandible (x1).

Specimen No. G.S.I. Type 18675.



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*Discussion.* In comparison, the fourth premolar of the specimen under question is similar to that figured in "Fauna Antiqua Sivalensis" (Pl. 70, fig. 8) under the name *Sus giganteus* F. & C. (1846), except for some difference in size. It also resembles *Sus hysudricus* F. & C. figured in the same work (Pl. 71, fig. 11), with the main difference that in the present specimen the enamel outline on the posterior side of  $PM_4$  is wider transversely. Both these fossils have been discussed by Pilgrim (1926, p. 45) in his memoir on the Fossil Suidae of India and have been referred by him to *Dicoryphochoerus durandi* gen. et sp. nov.

Keeping in view the structure and dimensions of the fourth premolar, the present specimen undoubtedly appears to belong to the genus *Dicoryphochoerus* Pilgrim, in case we accept the importance of this tooth as assigned by Pilgrim. However, the over-development of the enamel on the posterior side of the fourth premolar, forming a fold, cannot be overlooked, and this may be a specific character.

The fourth premolar also shows some similarity in the pattern of enamel folds to that of *Sus adolescense* Pilgrim, but it differs in size. Besides, the size of the jaw, and other dentition characteristics including their pattern, do not have much in common. Also,  $M_3$  is much larger in the present specimen. From *Dicoryphochoerus robustus* Pilgrim, it differs in having the third and fourth premolar much smaller and narrower.

As regards the molars, the third molar of the present specimen shows affinities with the third molar of *Sus falconeri* Lydekker (1884, Pl. VII, fig. 1), yet it differs a great deal in

size and development.  $PM_4$  too is considerably different in size and in the pattern of enamel folds and has depressed anterior and posterior portions unlike *Sus*.

Taking into considerations the above observations and accepting Pilgrim's contention, that the characters of  $PM_4$  are the reliable feature for classifying Suidae, it can be concluded that our specimen belongs to the genus *Dicoryphochoerus* Pilgrim. However, it may be mentioned here that  $PM_4$  of the present specimen is more evolved than any other species of *Dicoryphochoerus*.

As such the authors assign their specimen to a new species whose diagnostic characters are recapitulated below :

*Diagnostic characters.* A medium-sized suid with  $M_3$  very much elongated and having an exceptionally complex talonid. The length of  $M_3$  exceeds the combined lengths of  $M_1$  and  $M_2$ .  $PM_3$  and  $PM_4$  are longitudinally narrow and compressed. The enamel of the talonidal cusp of  $PM_4$  is much more expanded transversely and pointed on the anterior cusp in comparison with *Sus falconeri*. The incisors are rather circular in cross section. The rami are massive and swollen beneath the molars and premolars.

*Locality.* About one kilometre north-west of Tanda Bhagwanpur village.

*Horizon.* Pinjor stage.

*Repository.* G. S. I. Type 18675.

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