

A JAVANESE RHINOCEROS RECORDED FROM THE UPPER SIWALIKS OF AZAD KASHMIR, PAKISTAN

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ABSTRACT

A mammalian fragmentary collection comprising a right upper third premolar, a fragment of the occipital region and a thoracic vertebra, made from the Pinjor Zone of the Upper Siwaliks of Azad Kashmir, Pakistan, is here referred as Rhinoceros kendengindicus Dubois. This species was discovered by Dubois in 1908 from Java but was hitherto unrecorded from the Siwalik hills.

INTRODUCTION

In September, 1968, the author alongwith some M. Sc. students made a field trip to the Jari Kas area of district Mirpur, Azad Kashmir, Pakistan, under the project "Survey of Vertebrate Fossils of West Pakistan", (guided by Dr. Abu Bakr of the Zoology Department, Panjab University). In this area the rock strata generally dip towards north with a general east-west strike. The low altitude mountains exhibit two major rock types exposed in the subject area. The lower one, being light yellow to light pink coloured coarse shales mixed with pebbles overlain by loosely-bedded, friable sandstone of light grey colour. On September 21, while working in the upper friable sandstone, the author found a right upper third premolar, a nasal fragment of the occipital region and a thoracic vertebra, all belonging to a single individual. These fragments were found closely associated with the fossil material of the genera *Elephas* Linnaeus, *Equus* Linnaeus, *Hexaprotodon* Falconer and Cautley, *Cervus* Linnaeus, *Hemibos* Falconer and *Leptobos* Rutimeyer. Among these genera the first is taken as index fossil for the Pleistocene rocks (see Mathew, 1929, p. 530), hence, there left no doubt to label this fossil yielding upper layer (friable sandstone) as belonging to the Pleistocene age.

Perissodactyla Owen

Rhinocerotidae Owen

Rhinoceros Linnaeus

Rhinoceros kendengindicus Dubois

(Plates I-III, tables 1-2)

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Material :

UZ* 69/525, a postero-lingually damaged r.P³, a nasal fragment, a fragment of the occipital region and a thoracic vertebra, all belonging to a single individual.

Locality :

Jari Kas, district Mirpur, Azad Kashmir, Pakistan.

Horizon :

Pinjor Zone of the Upper Siwaliks.

DESCRIPTION**(a) Right P³**

It is a well preserved hypsodont tooth. Less backward extension of the protoloph and the length-width index confirm it to be an upper P³ in succession. Cingulum is present at the anterior surface of protoloph, nearly in the middle of the crown height, but absent lingually. The protoloph, which is in form of a sharp blade at the summit, has just started wearing. Due to a backward extension of the protoloph, the lingual pass of the median valley is very much shallower. The protocone and paracones are separate from one another at the summit but are united at about the anterior cingular level. The anterior face of the tooth shows a vertical depression extending from the cingular level to the crown base, thus separating the protocone from the paracone. The protocone gradually increases in thickness from the summit to the cingular level but becomes uniform in thickness from the cingular level to the crown base. The ectoloph is almost straight and is slightly worn. The parastyle is weakly produced where as metastyle seems to be indistinct. A strong and pointed crista projects in the median valley from the ectoloph. Hypocone is slightly damaged postero-lingually. The metaloph, like the protoloph, is also in a form of sharp blade and is hardly touched by wear. From the metaloph, a strong and pointed crochet projects in the median valley which would unite with the crista on deep wear, to enclose a fossete. Posteriorly, the cingulum being much raised, encloses a deep posterior valley.

(b) Nasal Fragment.

Evidenced by the rugosity of its dorsal surface, it is recognised as a horn bearing portion of the nasal. The less produced rugosity on the nasal bone indicates the short size of the horn. The rugose surface area of

* Fossil Vertebrate Collection, Zoology Department, Univ. Punjab, Lahore.

UZ 69/525 is almost equal to that of the holotype of *Rhinoceros kendengindicus* Dubois (Dubois Collection no. 1991, in Hooijer 1946, pl. VII, fig. 1 & 2).

(c) Fragment of the Occipital Region.

In this fragment, the left occipital condyle is well preserved whereas that of the other side is damaged. In measurements, it is identical with the holotype (above cited) of *R. kendengindicus* Dubois. Anterior condyloid foramen of the both sides, in the basi-occipital, are quite visible dorso-ventrally.

(d) Thoracic Vertebra.

The presence of anterior and posterior facets, for the attachment of tuberculum and the capitulum, indicate its position as thoracic one. It is damaged dorso-laterally, hence the right transverse process and the neural arch along with the neural spine are missing. Laterally, at the base of the left transverse process, are the two facets, an anterior and a posterior for the attachment of capitulum and tuberculum of the ribs respectively. The anterior facet is deeply notched and is much smaller than the posterior one. The transverse process is somewhat backwardly directed and is quite thick. The centrum shows lateral depressions, produced at the bases of transverse processes.

DISCUSSION

Upper Siwaliks have yielded three fossil rhinoceroses (Mathew, 1929, p. 444; Colbert, 1935, p. 33) i.e. *Coelodonta platyrhinus* Falconer and Cautley, *Rhinoceros sivalensis* Falconer and Cautley, and *R. palaeindicus* Falconer and Cautley. The specimen under study UZ 69/525 differs from these three species and *R. sivalensis* Deraniyagala (Deraniyagala 1945, P. 27) in having almost straight ectoloph, slightly produced parastyle, a vertical anterior depression in the protoloph, presence of anterior cingulum, absence of inner cingulum, backwardly directed protoloph, large crista united with the crochet and higher internal pass of the median valley. On the bases of these characters, the author refers this specimen (UZ 69/525) to *R. kendengindicus* Dubois (see revised diagnosis by Hooijer, 1946, pp. 84-85). It is progressive than *R. unicornis* Linnaeus in having more developed postero-internal angle and so is more molariform than in the latter. In this respect, it agrees with *C. platyrhinus* from the Upper Siwaliks (Lydekker, 1881, pl. VIII). But considering size, it is very much smaller than the latter (see Lydekker 1881, p. 49). The specimen under study is comparatively smaller than the *R. kendengindicus* of Dubois Collection no. 1977a (see table 2).

TABLE I

Measurements of *R. kendengindicus* UZ 69/525

(a) Right P ³	Maximum antero-posterior length	46 mm
	Maximum width	50 mm
	Lingual width at the crown base	34 mm
	Maximum height of ectoloph	50 mm
	Width-height index	1.00
(b) Fragment of the occipital region	Distance from middle of the foramen magnum to the extreme lateral end of the left occipital condyle	64 mm
	Transverse diameters of the foramen magnum... ..	40 mm
	Distance between right and left anterior condyloid foramina (ventrally)	63 mm
(c) Thoracic Vertebra	Distance from the middle of the centrum to the lateral tip of the left transverse process	123 mm
	Vertical height of the centrum	100 mm
	Basal transverse width of the neural arch.	50 mm

TABLE II

Comparative measurements of P³ of *R. kendengindicus*

	UZ 69/525	Debois Collection No. 1977a
Maximum Width	50 mm	56 mm
Maximum Height	50 mm	58 mm
Width-Height index	1.00	0.97

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Fig. 1. Crown view of r.P³, natural size.Fig. 2. Buccal view of r.P³, natural size.Fig. 3. Lingual view of r.p³, natural size.

PLATE II

(UZ 69/525)



Fig. 1. Dorsal view of nasal fragment, one half natural size.



Fig. 2. Ventral view of nasal fragment, one half natural size.



Fig. 3. Dorsal view of occipital fragment,
one half natural size.

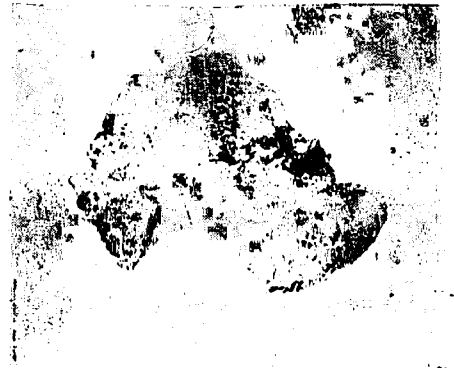


Fig. 4. Ventral view of occipital fragment,
one half natural size.



Fig. 5. Posterior view of occipital fragment, one half natural size.



Fig. 1. Top view of thoracic vertebra
one half natural size.



FIG. 2. Anterior view of thoracic vertebra
one half natural size.



Fig. 3. Posterior view of thoracic vertebra, one half natural size.

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