

## FIRST RECORD OF *MARTES LYDEKKERI* FROM DHOK PATHAN FORMATION OF PAKISTAN

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**ABSTRACT:** An excellently preserved right mandibular ramus is being described from Dhok Pathan Formation (Middle Siwaliks). A comparison of the specimen under study with known material of *Martes* genus has shown that this is referable to *Martes lydekkeri*. Before this report, it was described from Chinji Formation (Lower Siwaliks) by Colbert (1933), but this addition to Siwalik carnivora indicates that the paleogeographical range of *Martes lydekkeri* is from Lower to Middle Siwaliks.

**Key Words:** Mandible, Dhok Pathan, Siwaliks and *Martes*.

### INTRODUCTION

The Siwalik carnivores represent a great variety of genera and species. Bose described fossil carnivores from the Siwaliks as early as 1880. Significant contributions in this direction were, later on, made by Lydekker (1884) and Pilgrim (1932). Mammals, as group, from Siwaliks were critically observed by Matthew (1929). Pilgrim (1913) made a comparative study of the Siwaliks and European mammals. A comprehensive study of Siwalik mammals was carried out by Colbert (1935). Simpson (1945) divided the family Mustelidae into six subfamilies, but some rearrangements in different subfamilies of family Mustelidae were made by Wilson and Reeder (1992).

The genus *Martes* was discovered by Pinel (1792). It is widely distributed throughout the forested regions of Eurasia and North America. A palearctic origin is indicated and the earliest known occurrence is from Lower Miocene beds. Well adapted to their environment, they have changed very little during this long stretch of time. Never a dominant member of the fauna, the martens, small size and wandering, arboreal habits have lessened the chances of their remains being fossilized; consequently the fossil record is incomplete.

The ancestry of *M. fonia* is unknown, although it shows similarities to *M. vetus*, it occupies a different ecological niche and is not present in the European fauna until postglacial times. *M. flavigula* and *M. gwatkinsi*, the Asian yellow martens differ from the others by the peculiar structure of the baculum. A possible ancestor is *M. lydekkeri* from the Chinji zone of the Siwaliks and a subspecies of *M. flavigula* is known from the Middle

Pleistocene of China. *M. gwatkinsi* survives as an isolated relict population in Southern India (Anderson, 1970).

### Abbreviations

Amer. Mus:	American Museum of Natural History, New York, USA.
P.U.P.C.	Punjab University paleontological collection, stored in the Department of Zoology, Lahore, Pakistan.
L:	Maximum preserved anteroposterior crown length of tooth.
W:	Maximum preserved crown width of tooth.
CI:	Crown shape index. $(W/L \times 100)$ a ratio between width and length of crown.
mm:	Millimeter.
P <sub>2</sub>	Second right lower premolar.
P <sub>3</sub>	Third right lower premolar.
P <sub>4</sub>	Fourth right lower premolar.
M <sub>1</sub>	First right lower molar.

## SYSTEMATICS

Class	Mammalia Linnaeus
Subclass	Theria Haswell
Infraclass	Eutheria Gill
Super Order	Ferae Linnaeus
Order	Carnivora Bowdich
Suborder	Caniformia Wilson and Reeder
Super family	Canoidae Simpson
Family	Mustelidae Swainson
Sub family	Mustelinae Gill
Genus	<i>Martes</i> Pinel
Species	<i>Martes lydekkeri</i> Colbert

### Holotype

Amer. Mus. No. 19407, a fragmentary mandible with right and left M<sub>1</sub>

### Type Locality

Chinji, Salt Range, Chakwal district, the Punjab province, Pakistan.

### Horizon

Lower Siwaliks.

### Diagnosis

Equal to *Martes Martes* in size. Lower carnassials with a high trigonid and a low basined talonid. Metaconid distinct and well developed (Colbert, 1933).

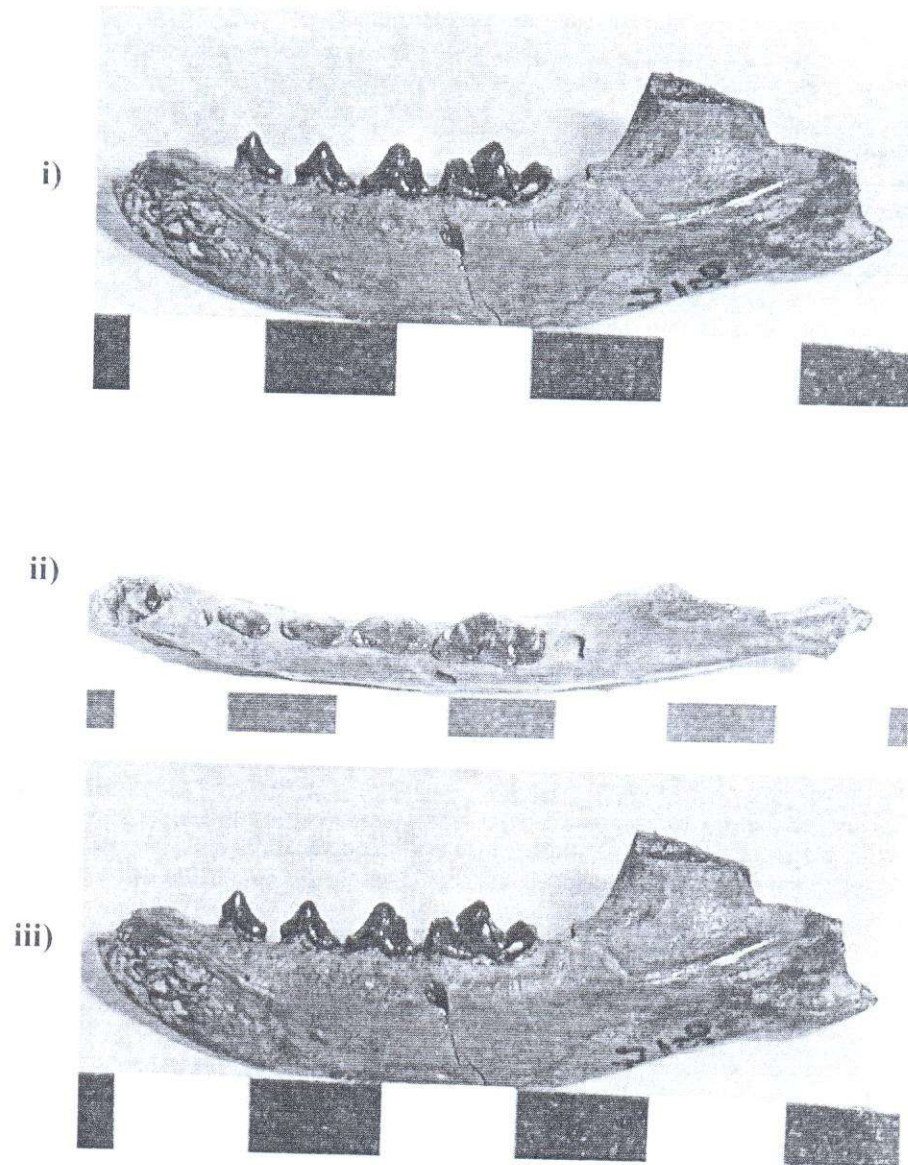


Fig. 1: *Martes lydekkeri* (Colbert). A right mandibular ramus having  $P_2-M_1$  (P.U.P.C. No. 95/17), collected from Padhri, Jhelum district, the Punjab province, Pakistan. i) Inner view, ii) Crown view, iii) Outer view.



**Material Studied**

P.U.P.C. No. 95/17 (Fig. 1), A right mandibular ramus having  $P_2-M_1$ .

**Locality**

Padhri, Jhelum district, the Punjab province, Pakistan.

**Horizon**

Middle Siwaliks.

**Description**

The specimen under study includes the right mandibular ramus with  $P_2-M_1$ . The ramus as well as the teeth is in an excellent state of preservation. The mandible includes, the anterior portion of vertical ramus, and horizontal ramus with symphysis. The length of preserved mandibular ramus is 70.5 mm, while the height of vertical ramus is 21 mm and the length of symphysis is 21 mm. Depth of ramus below canine is 10.3 mm, below  $P_2$  is 11.2 mm, while below  $M_1$  is 12 mm, respectively.

$P_2$  is smaller than  $P_3$ , while  $P_3$  is smaller than  $P_4$ . In all premolars the protoconid is well developed and sharp. The teeth are at early stage of wear. All premolars are broad at the base and narrow anteriorly. The paraconid from  $P_{2-4}$  is small and rudimentary. The posterior accessory cusp is well developed in  $P_{2-3}$ , while it is much prominent in  $P_4$ .  $M_1$  is also excellently preserved, showing large trigonid and small talonid. In trigonid, the protoconid is large and higher than that of paraconid and metaconid. In  $M_1$ , the paraconid is also broad than metaconid. The former is also vertically higher than the latter. The talonid is also well preserved, consisting of large hypoconid and small entoconid. Anteriorly the ramus is showing hollow space instead of canine, indicating that it has large canine.

**DISCUSSION**

*Martes lydekkeri* was originally described as *Mustela lydekkeri* having been compared with *Mustela palaeosinensis*, rather than with modern *Mustela*. However, since the Siwalik specimen has a well-developed metaconid, as in *M. palaeosinensis* as well which structure lacking in the modern *Mustela*.

In type specimen of *Mustela lydekkeri*, the jaw in the British Museum, described by Lydekker as *Mustela* sp., was referred to the species *Martes lydekkeri*.

After careful re-examination of the Amer. Mus. specimen and its comparison with Lydekker's description and figure and with Pilgrim's description, Colbert (1933) concluded that both the specimens belong to same species as *Martes lydekkeri*. Moreover, Colbert (1933) compared Amer. Mus. specimen with Zdansky's figures of the type of *Sinictis dolichognathus* and conclude that *Martes lydekkeri* is not of the genus *Sinictis*, because it is considerably smaller than the typical *Sinictis*, but also it is characterized by a distinctly basined talonid, whereas *Sinictis* is defined as having a trenchant talonid.

The specimen under study has greater anteroposterior and transverse values of  $M_1$  than that of Amer. Mus. collection. Similarly the specimen described in present work also have greater values of protoconid heights, whereas the height of metaconid is exactly

similar in P.U.P.C. No. 95/17, while other two specimens under study have greater values of metaconid heights. Length of talonid has lesser value in P.U.P.C. No. 95/17 than that of type specimen. Depth of ramus below protoconid is greater in P.U.P.C. No. 95/17 than that of Amer. Mus. collection (Table 1).

The chief distinction of Siwalik form from other primitive species of *Martes* is its larger protoconid, otherwise it is almost identical in its shape and structure with the modern *Martes* (Colbert, 1933).

In lower jaw  $I_1$  is minute,  $I_{1-3}$  are wider, canines are slightly curved, the first lower molar is also very small  $P_{2-3}$  are double rooted, single cusped teeth,  $P_4$  has a small posterior accessory cusp,  $M_1$  is equal in size with *Martes Martes*, while  $M_2$  is a small nearly rounded tooth, double rooted, with two small cusps. There is also a gradual decrease from postglacial to recent (Anderson, 1970).

**Table I:** Comparative dental measurements (mm) of lower first right molar referred to *Martes lydekkeri* (Colbert).

	P.U.P.C. No. 95/17	Amer. Mus. No. 19407
Length of $M_1$	10	9.9
Width of $M_1$	5.4	4.4
Height of protoconid	5.5	4.8
Height of metaconid	04	3.2
Length of talonid	04	4.5
Depth of ramus below protoconid	12	9.8

The mandible is deeper and shorter below premolars in the fossil material (Kurten, 1965). In material under study the incisors and canines are missing.  $P_{2-3}$  are single cusped and double rooted,  $P_4$  is also with small posterior accessory cusp. The space left by canine in the material under study also suggests that it is large and slightly curved.

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