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(Tragulidae, Mammalia) from the Chinji  
Formation Near Daud Khel,  
Mianwali District, Pakistan**

**Robert M. West**

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#### ADDENDUM

While this paper was in press a second upper third molar of Dorcatherium minimus was recovered from the Locality 18 concentrate. H-GSP 2300, a right M<sup>3</sup>, is less worn than is H-GSP 1983 and almost certainly represents another individual. It is 4.8 mm long and 5.1 mm wide. Apart from its slightly smaller size, it is morphologically similar to H-GSP 1983.

**A Minute New Species of  
*Dorcatherium* (Tragulidae,  
Mammalia) from the Chinji Formation near  
Daud Khel, Mianwali District, Pakistan**

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**Abstract.** *Dorcatherium minimus* is the smallest known Asian tragulid. The only available specimens are from the upper part of the Chinji Formation near Daud Khel, Mianwali District, Pakistan. *D. minimus* lacks an internal cingulum and in this way resembles modern *Tragulus*.

### INTRODUCTION

Although vast numbers of fossil large mammals have been collected from the Neogene Siwalik Group in India and Pakistan over the last 150 years, relatively few remains of small mammals have been reported. Rodents have been discussed by Colbert (1935), Wood (1937), Black (1972), Prasad (1968), Hussain *et al.* (1977), Jacobs (1978) and Vasishat (1978). Sahni and Khare (1976) reported on a single fragmentary insectivore tooth, and a few small primates recently have been discussed by Gingerich and Sahni (1979), Chopra *et al.* (1979), and Chopra and Vasishat (1979). Only the studies of Jacobs and Hussain *et al.* are based upon large screen-washed samples.

This contribution describes a new species of tiny tragulid artiodactyl recovered from screen-washed concentrate collected near the local top of the Chinji Formation northeast of Daud Khel, Pakistan. Detailed discussions of the geologic and biostratigraphic setting are in Hussain *et al.* (1977), Munthe *et al.* (1979) and Hussain *et al.* (1979).

### ABBREVIATIONS

AMNH — American Museum of Natural History, New York  
BM(NH) — British Museum (Natural History), London  
GSI — Geological Survey of India, Calcutta  
H-GSP — Howard University — Geological Survey of Pakistan  
Project, Washington, D.C. and Quetta, Pakistan  
L — Maximum length  
W — Maximum width

## SYSTEMATIC PALEONTOLOGY

Order Artiodactyla

Family Tragulidae

Genus *Dorcatherium* Kaup 1833*Dorcatherium minimus* new speciesHolotype: H-GSP 1983, left M<sup>3</sup>.

Locality: H-GSP locality 18, upper Chinji Formation, northeast of Daud Khel, Mianwali District, Pakistan.

Hypodigm: Holotype plus H-GSP 1984, left astragalus.

Repository: The original specimens are in the collection of the Geological Survey of Pakistan. High quality epoxy casts are at the Milwaukee Public Museum.

Etymology: The smallest known species of *Dorcatherium*.Diagnosis: A very small species of *Dorcatherium*, relatively low crowned, upper third molar lacking an internal cingulum.Description: The single M<sup>3</sup> (Fig. 1) is like other, larger species of *Dorcatherium* in all respects except the absence of an internal cingulum.

The mesostyle is well developed, and there is a prominent rib on the

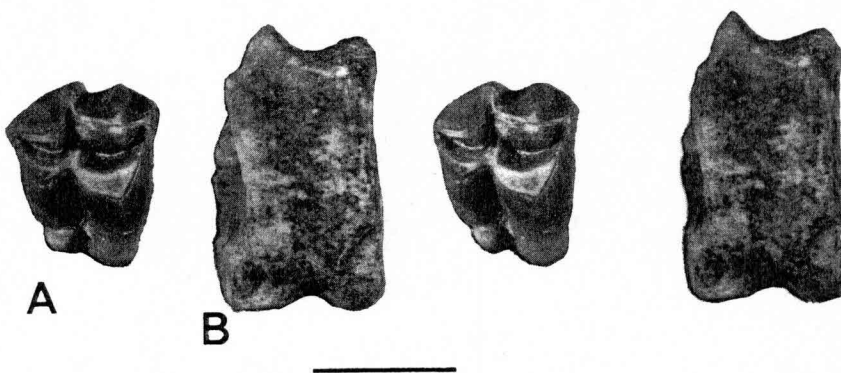


Figure 1. Stereophotographs of *Dorcatherium minimus*.

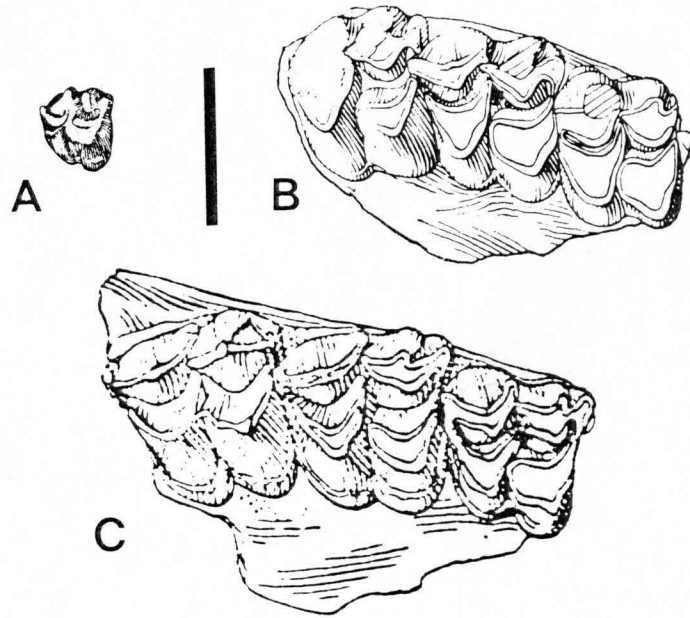
A. Occlusal view of holotype, H-GSP 1983, LM<sup>3</sup>

B. Plantar view of left astragalus, H-GSP 1984

Scale equals 5 mm.

external face of the paracone. Internally, there is modest development of a basal pillar. The tooth is less hypsodont than are the upper molars of larger species. Its length and width dimensions are approximately 80% those of *D. parvum*, the next larger species, from Rusinga Island, Kenya, and about 70% those of *D. nagrii*, the next larger Siwalik species (Prasad, 1968). The small size of *D. minimus* is emphasized in Fig. 2.

The astragalus (Fig. 1) shows evidence of substantial abrasion, as most surfaces are rounded and the various facets have been smoothed. Nonetheless, it is virtually identical to numerous specimens of astragali of *D. parvum* from Rusinga Island in the collection of the British Museum (Natural History). It is approximately 80% the size of those *D. parvum* astragali.



**Figure 2.** Comparison of *Dorcatherium minimus* with other small Asian species of *Dorcatherium*, all to same scale.

- A. *Dorcatherium minimus*
- B. *Dorcatherium nagrii* (from Colbert 1935 — there called *D. sp.*)
- C. *Dorcatherium minus* (from Colbert 1935)

Scale equals 1 cm.

## DISCUSSION

*D. minimus* is the smallest and, to date, rarest species of *Dorcatherium*. H-GSP locality 18 has yielded over 1,000 identifiable rodent teeth (J. Munthe, pers. comm., December 1979) and 19 insectivore teeth, but only one tooth and one astragalus of *D. minimus*. This record suggests that it is unlikely that more *D. minimus* material will be found soon, so the species merits description despite the distressingly small sample.

*Dorcatherium* is a common tragulid genus in late Neogene continental rocks of Europe, East Africa and South Asia, and may well be congeneric with modern African *Hyemoschus* and Indian *Tragulus* (Gentry, 1978). Three species have been recognized previously from the Siwaliks of India and Pakistan (Colbert, 1935; Prasad, 1968).

The morphologic feature which characterizes *D. minimus*, apart from its small size, is the absence of an internal cingulum. Colbert (1935) noted relatively poor cingulum development in some specimens of *D. minus*. Prasad (1968, p. 39), in his description of *D. nagrii*, noted the slight development of the cingulum in the anterior upper molars, although he indicated that  $M^3$  has a well developed cingulum. He also noted a trend toward reduction of the cingulum in specimens collected from younger Siwaliks beds. In the absence of the internal cingulum *D. minimus* approaches the conditions seen in modern *Tragulus*, even though it occurs in lower Siwaliks rocks.

## ACKNOWLEDGMENTS

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TABLE 1

Dimensions (in millimeters) of *Dorcatherium* M<sup>3</sup>

<i>D. minimus</i>	<i>D. minus</i> <sup>1</sup>	<i>D. nagrii</i> <sup>2</sup>	<i>D. parvum</i> <sup>3</sup>		
H-GSP 1983 L 5.1 W 5.5	AMNH 29856 L 11.5 W 13.0	GSI 18081 L 7.1 W 7.0	BM(NH) 505.47	L 6.1	W 6.8
			891.50	6.1	6.8
			996.50	6.1	6.5
			1164.50	7.1	6.1
			1658.50	6.1	7.3
			751.52	7.3	8.0

<sup>1</sup> from Colbert 1935<sup>2</sup> from Prasad 1968<sup>3</sup> from Whitworth 1955



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