

## **Discovery of chalicothere and *Dorcabune* from the upper part (lower Pleistocene) of the Irrawaddy Formation, Myanmar**

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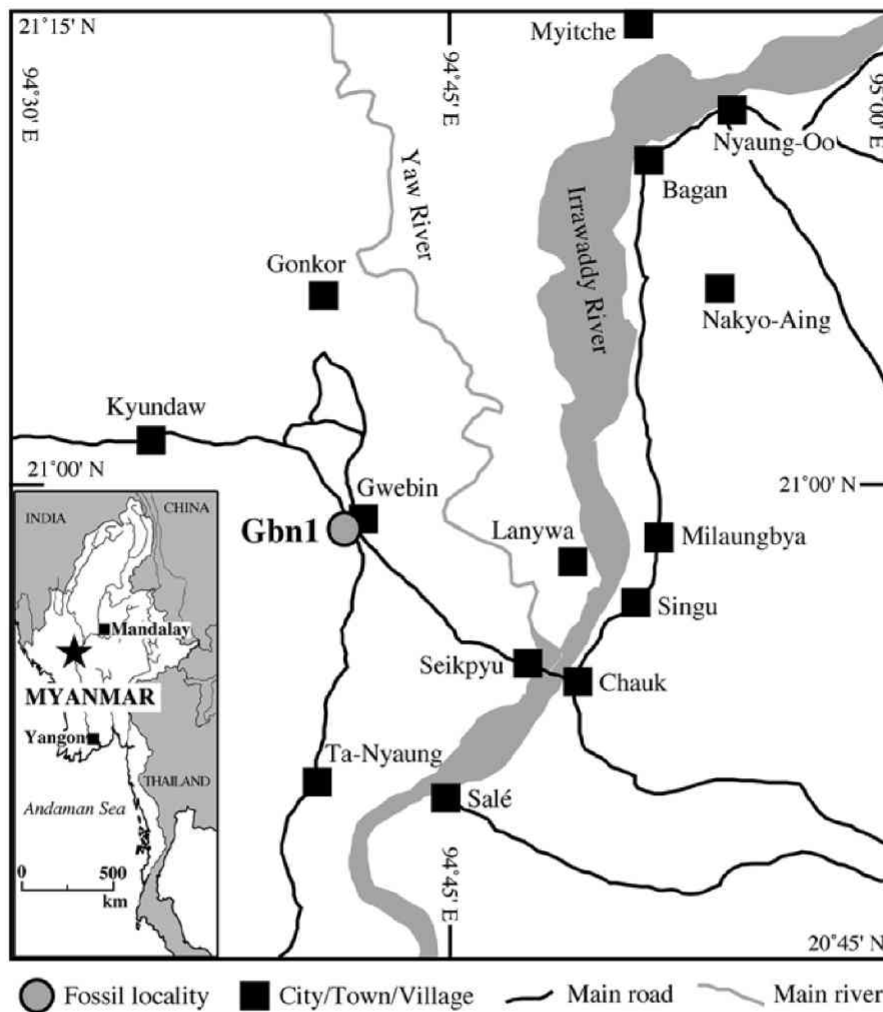
### **Abstract**

We describe fossil dental specimens of a chalicothere (Perissodactyla, Mammalia) and *Dorcabune* (Tragulidae, Artiodactyla, Mammalia) discovered from the upper part (lower Pleistocene) of the Irrawaddy Formation at Gwebin area, central Myanmar. The specimens described here consist of three molar fossils: a left upper molar and a left M<sub>1</sub> or M<sub>2</sub> of a chalicothere (cf. *Nestoritherium* sp.); and a right M<sub>3</sub> of *Dorcabune* sp. Although fragmentally, this is the first discovery of the Chalicotheriidae and *Dorcabune* from the upper part of the Irrawaddy Formation.

### **Introduction**

The upper Miocene to lower Pleistocene Irrawaddy Formation (= Irrawaddy Group = Irrawaddy Series = Fossil Wood Group) is widely distributed in central Myanmar (Theobald, 1869; Noetling, 1895; Stamp, 1922; Bender, 1983), yielding many mammalian fossils (Colbert, 1938, 1943; Moe Nyunt, 1987). We, the Kyoto University field parties with Myanmar researchers, carried out a fossil expedition at the Gwebin area of central Myanmar, where the upper part of the Irrawaddy Formation is exposed (Bender, 1983; Moe Nyunt, 1987) during the field season of 2002 November. At the Gwebin area, we found fossil dental remains of the Chalicotheriidae (Perissodactyla, Mammalia) and *Dorcabune* (Tragulidae, Artiodactyla, Mammalia).

In this short article, we describe these fossils. Although fragmentally, this is the first discovery of the Chalicotheriidae and *Dorcabune* from the upper part of the Irrawaddy Formation (Colbert, 1938, 1943; Moe Nyunt, 1987).



**Figure 1.** Map of the central part of Myanmar, showing the fossil locality (Gbn1) of the upper part of the Irrawaddy Formation.

### Abbreviations

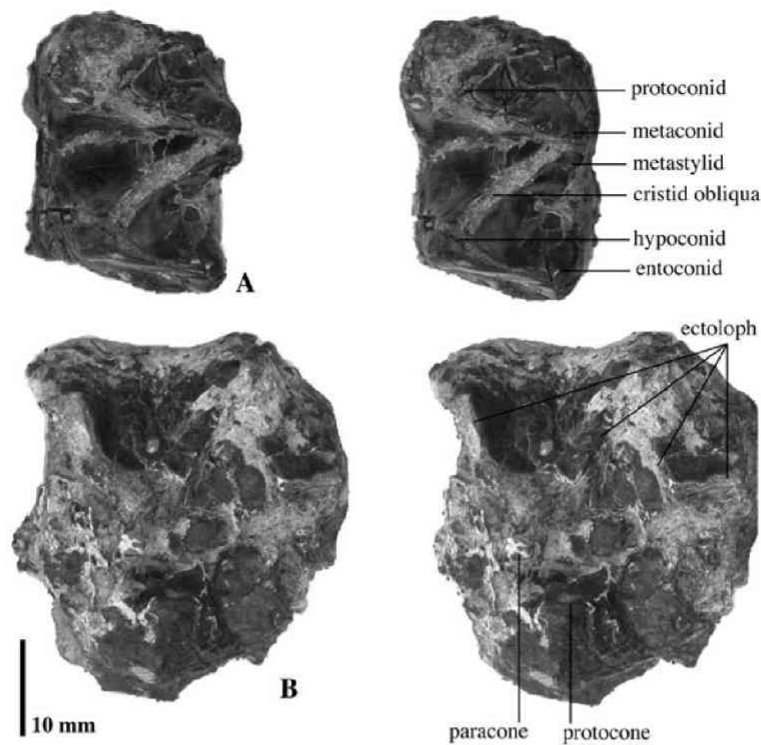
NMMP-KU-IR, National Museum - Myanmar - Paleontology - Kyoto University - Irrawaddy (stored in the National Museum, Yangon, Myanmar, and in the Department of Geology, University of Yangon, Yangon, Myanmar).

### Fossil locality

The Gbn1 locality (an approximate GPS = 20°58'31"N; 94°41'27"E), which is located at the west side of the main road of Gwebin village, Seikpyu Township, Magway Division, central Myanmar (Figure 1).

### Stratigraphic position

The upper part of the Irrawaddy Formation, geologically located in the Central Irrawaddy Lowland (Ba Than Haq, 1981; Bender, 1983). The upper part of the Irrawaddy



**Figure 2.** Cf. *Nestoritherium* sp. **A:** NMMP-KU-IR 0051, a fragmentary left  $M_1$  or  $2$ , occlusal view (stereo pair). **B:** NMMP-KU-IR 0053, a fragmentary left upper molar, occlusal view (stereo pair).

Formation at Gwebin area consists mainly of fluvial deposits, yielding many mammalian fossils such as bovids, suids, hippos, anthracotheres, rhinos, and elephants (Moe Nyunt, 1987).

### Geologic age

Early Pleistocene, according to the mammalian fauna of the upper part of the Irrawaddy Formation at Gwebin area (Colbert, 1943; Moe Nyunt, 1987).

### Systematic paleontology

Order Perissodactyla Owen, 1848

Family Chalicotheriidae Gill, 1872

Subfamily Chalicotheriinae Gill, 1872

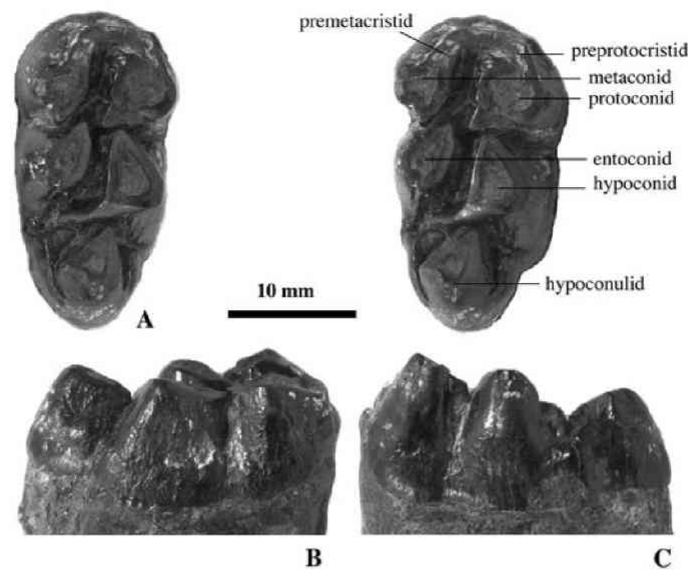
Genus cf. *Nestoritherium* Kaup, 1859

Cf. *Nestoritherium* sp.

Figure 2

**Material.**—NMMP-KU-IR 0051, a fragmentary left  $M_1$  or  $2$ ; NMMP-KU-IR 0053, a fragmentary left upper molar.

**Dental measurements.**— $M_1$  or  $M_2$  (NMMP-KU-IR 0051): length (estimate) = 30.8 mm; trigonid width = 20.8 mm; talonid width (estimate) = 20.2 mm.



**Figure 3.** *Dorcabune* sp. (NMMP-KU-IR 0055, a right  $M_3$ ). **A:** occlusal view (stereo pair). **B:** buccal view. **C:** lingual view.

*Description and comments.*—NMMP-KU-IR 0051 (Figure 2A) is referable to a fragmentary left lower molar of a chalicothere in having brachyodont crown, a metastylid, a cristid obliqua linking to the metastylid, and no hypoconulid. NMMP-KU-IR 0053 (Figure 2B) is referable to a fragmentary left upper molar of a chalicothere in having W-shaped ectoloph and in being relatively large. These materials are provisionally referred to *Nestoritherium* because the present materials are very poor and because *Nestoritherium* is the only recorded Pleistocene chalicotheriid in Asia. This is the first discovery of the Chalicotheriidae in the upper part of the Irrawaddy Formation, although a possible chalicotheriid femur have been found in the lower part of the Irrawaddy Formation (Noetling, 1897a, b; Hooijer, 1951).

Order Artiodactyla Owen, 1848  
 Suborder Ruminantia Scopoli, 1777  
 Family Tragulidae Milne-Edwards, 1864  
 Genus *Dorcabune* Pilgrim, 1910

*Dorcabune* sp.

Figure 3

*Material.*—NMMP-KU-IR 0055, a right  $M_3$ .

*Dental measurements.*— $M_3$  (NMMP-KU-IR 0055): length = 25.4 mm; trigonid width = 12.6 mm; talonid width = 11.9 mm.

*Description and comments.*—NMMP-KU-IR 0055 shows a typical morphology of tragulid  $M_3$  with *Dorcatherium*-fold (= “sigma structure” in Qiu and Gu, 1991; = “M

structure" in Mottl, 1954, 1961) and enlarged hypoconulid. The present  $M_3$  is low-crowned, rather bunodont than selenodont among the tragulids, and moderately worn. The metaconid is mesiodistally located nearly at the same position as the protoconid. The preprotocristid and premetacristid do not protrude mesially very much; and they are connected to one another, forming mesially closed trigonid basin. The entoconid is mesial to hypoconid. There seems to be no hypoconulid loop. There is no cristid linking the entoconid to the hypoconulid. Cingula are present at the mesial margin of the crown and at the lingual base of the hypoconulid. There are accessory cusps between the lingual base of the protoconid and hypoconid and between the lingual base of the hypoconid and hypoconulid. The dental size ( $M_3$  length = 25.4 mm) is rather similar to that of larger *Dorcabune* and *Dorcatherium* species rather than to that of smaller species (Colbert, 1935).

The present  $M_3$  is referable to *Dorcabune* rather than to *Dorcatherium* because: (1) the cusps of the present  $M_3$  seem to be more bunodont than those in *Dorcatherium*; (2) the preprotocristid and premetacristid of the present  $M_3$  are not so mesially protrudent as those in *Dorcatherium*; and (3) the present  $M_3$  has distinct lingual and buccal cingulids on the hypoconulid region (Pilgrim, 1915: pls. 21-23; Colbert, 1935: p. 303, fig. 137, p. 308, fig. 140, p. 310, fig. 142, p. 312, fig. 144; Qiu and Gu, 1991). This is the first discovery of *Dorcabune* in Myanmar and is the first discovery of the Tragulidae from the Irrawaddy Formation.

### Acknowledgments

We are grateful to the personnel of the Ministry of Culture of Myanmar and the Myanmar Embassy in Japan for the permission of our fossil research. We are also grateful to the personnel of the Myanmar-Japan (Kyoto University) Joint Fossil Expedition Team and to the curators of the National Museum of Myanmar for their guidance and help in the field and museum. Thanks are also to Prof. Nobuo Shigehara (Kyoto University, Japan) for his financial support. Researchers from several Myanmar and Japanese universities have been helped us with paleontological and geological information on the Irrawaddy Formation, particularly Drs. Aye Ko Aung, Tin Thein, Soe Thura Tun, Aung Naing Soe, Hisashi Suzuki, Hiroaki Ugai, and Takeshi Nishimura. Financial supports were provided by the MEXT Overseas Scientific Research Fund (09041161, 14405019, 16405018) and by the MEXT Grant-in-Aid for the COE Research (10CE2005), for the 21st Century COE Program (A14 to Kyoto University), and for the JSPS Fellows (15004836, 15004748).

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