

## A new species of the rhinoceros *Aceratherium* from the Late Miocene of Nakhon Ratchasima, northeastern Thailand

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The studied fossils were collected from the Tha Chang sand pits in Nakhon Ratchasima Province, Thailand, and they were donated by Mr. Piriya Watchajitpan. This area is 220 km northeast of Bangkok (Hanta et al., 2008). The age of the fossiliferous deposits in the Tha Chang sand pits have been estimated to be 9–7 Ma or 7.4–5.9 Ma (Chaimanee et al., 2006). The specimens studied herein are deposited in Northeastern Research Institute of Petrified Wood and Mineral Resources, Nakhon Ratchasima Rajabhat University.

Order Perissodactyla Owen, 1848

Family Rhinocerotidae Owen, 1845

Subfamily Aceratheriinae Dollo, 1885

Tribe Aceratherini Dollo, 1885

Genus *Aceratherium* Kaup, 1832

*Aceratherium* sp. nov.

**Holotype.** An adult skull (PRY 142) without premaxillae and the anterior portion of the nasals, keeping the cheek teeth from P4 to M3, and the almost complete mandible (PRY 141), losing tusks of i2. Based on the wear degree of their teeth, the skull PRY 142 and the mandible PRY 141 may be the same individual.

**Referred material.** A mandible (PRY 143) with the broken symphysis, lacking the right ascending ramus.

**Type horizon and locality.** Late Miocene (corresponding to MN 12 in Europe) at Tha Chang, Nakhon Ratchasima Province, Thailand.

**Diagnosis.** Mid-sized species of *Aceratherium* with broadly separated parietal crests, slightly expanded zygomatic arches, narrow and long skull roof, moderately wide mandibular symphysis, strong crochets, long metalophs, and constricted molar protocones.

**Comparison.** The narrow skull, the moderately wide mandibular symphysis with tusk-like lower incisors, and the high crowned cheek teeth with constricted protocones indicate that the Tha Chang specimens belong to the subfamily Aceratheriinae. The highly molariform premolars and the moderately developed molar antecrochets indicate that the Tha Chang rhino belongs to the genus *Aceratherium*.

Since Kaup (1832) created the genus *Aceratherium*, many rhinoceros forms have been described as the species of this genus. Later, however, most of them were referred into other genera within the subfamily Aceratheriinae or other subfamilies, such as *Acerorhinus*, *Alicornops*, *Pleuroceros*, *Mesaceratherium*,

*Hoploaceratherium*, and *Plesiaceratherium*. Now the genus *Aceratherium* includes only a few species, such as *A. incisivum* and *A. depereti*.

The Tha Chang skull narrows from the frontals to the nasals, not abruptly as in *Acerorhinus*, but gradually. The weakly posteriorly narrowing frontal bones and slightly laterally expanded zygomatic arches of the Tha Chang skull are different from those of *Alicornops*, which of the latter are strongly narrowing and expanded respectively. The occipital crest is straight in dorsal view, and the antecrochet is absent on P4 in the Tha Chang skull, but the occipital crest is concave, and the antecrochet is strong in *Pleuroceros*. The crochets are strong, the metalophs are long, the bridge is absent on P4, and the paracone rib is weak on M1 in the Tha Chang rhino, while the crochets are weak, the metalophs are short, the bridge is present on P4, and the paracone rib is strong on M1 in *Mesaceratherium*. Compared with *Hoploaceratherium*, the stronger crochet on P4, and the more reduced parolophid on p2 are the distinguishing characters of the Tha Chang rhino. Compared with *Plesiaceratherium*, the wide braincase, the broadly separated parietal crests, the long metalophs, and the strongly constricted protocones are the most important features of the Tha Chang skull.

The Tha Chang specimens have clear differences from *A. incisivum* Kaup, 1832 and *A. depereti* Borissiak, 1927. The skull of *A. incisivum* has narrowly separated parietal crests, and the parietal crests of *A. depereti* unite posteriorly to form a narrow and high sagittal crest, but the Tha Chang skull has very broadly separated parietal crests. The posterior parts of the zygomatic arches are more expanded in *A. incisivum* than in the Tha Chang skull. The crista and medifossette on P4 are developed in *A. incisivum*, and the crista is well developed and connects with the crochet to form a medifossette on premolars in *A. depereti*. On other hand, the crista is absent on all cheek teeth in the Tha Chang rhino. The metalophs on M1 and M2 are short and transverse or slightly oblique posteriorly in *A. incisivum* and *A. depereti*, but long and slightly oblique anteriorly in the Tha Chang form. The hypocone on M1 is rounded in *A. incisivum*, but constricted in the Tha Chang form. As a result, the rhinocerotid specimens from the Tha Chang sand pits are described here as a new species.

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