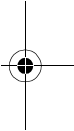
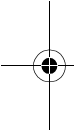




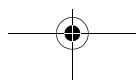
FOURTH INTERNATIONAL MEETING
ON MESOZOIC FISHES - SYSTEMATICS,
HOMOLOGY, AND NOMENCLATURE

MIRAFLORES DE LA SIERRA, MADRID, SPAIN
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EXTENDED ABSTRACTS



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HYBODONT SHARKS FROM THE EARLY CRETACEOUS OF THAILAND

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INTRODUCTION

Isolated teeth of six hybodont taxa have been recovered from the freshwater Sao Khua Formation of Thailand (CUNY *et al.* in press): *Hybodus* sp. A, *Hybodus* sp. B, *Parvodus* sp., *Lonchidion khoratensis* sp. nov., *Isanodus paladeji* gen. et sp. nov. (Figure 1), and *Heteroptychodus steinmanni*. The material is housed at the Thai Fossils collection (TF) of the Sahatsakhan Dinosaurs Research Centre, Sahatsakhan, Kalasin Province, Thailand.

This Early Cretaceous fauna seems to be less endemic than the hybodont fauna found in Thailand in the younger Aptian/Albian Khok Kruat Formation (CUNY *et al.* 2003). The presence of *Lonchidion* and *Parvodus* might be an indication of a possible European origin.

DISCUSSION

The hybodonts from Sao Khua are diversified, and show adaptation to a wide range of diets. *Parvodus* sp. was probably an opportunistic feeder, while the grinding dentition of *Lonchidion khoratensis* and *Heteroptychodus steinmanni* indicate more durophagous habits. *Isanodus paladeji* (Figure 1), with a clutching-grinding dentition, represents another type of durophagous shark. “*Hybodus*” sp. A & B probably fed on softer preys. The latter (170+ teeth), together with two durophagous sharks, *Isanodus paladeji* (185 teeth) and *Heteroptychodus steinmanni* (130+ teeth), largely dominate the fauna, while *Lonchidion khoratensis* (25 teeth), *Parvodus* sp. (19 teeth), and

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"*Hybodus*" sp. A (18 teeth) are much rarer. These sharks thus represented an important and diversified component of the freshwater ecosystems of the Sao Khua Formation.

The teeth of *Heteroptychodus* differ from those of *Ptychodus* by a reduced marginal area and a denser pattern of parallel longitudinal ridges ornamenting the crown. However, the general aspect of their teeth is very similar, and *Heteroptychodus* is included in the Ptychodontidae based on the ornamentation pattern of the crown, consisting of numerous, parallel mesio-distal ridges as well as the general aspect of the root.

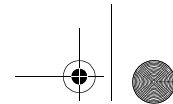
The teeth of *Isanodus paladeji* (Lonchidiidae) and *Heteroptychodus steinmanni* (Ptychodontidae) share a similar ornamentation pattern made of parallel mesio-distal ridges from which originate short, unbranched secondary ridges, which may suggest that these two genera are also closely related. *Heteroptychodus steinmanni* is so far the oldest member of the family Ptychodontidae, being known as early as the ?Berriasian in Thailand and Japan (CUNY *et al.* 2003, GOTO & KUGA 1982), while *Ptychodus* is unknown before the Albian and already shows a very specific tooth morphology (CAPPETTA 1987, SIVERSON 1999).

CONCLUSIONS

From the data presented above, it may be tempting to interpret the Ptychodontidae as having originated from a stock of Lonchidiidae that became increasingly adapted to durophagy; for instance, *Isanodus paladeji*, with its large grinding posterolateral teeth. This hypothesis would also explain the similarities between the teeth of *Hylaeobatis*, another Lonchidiidae, and those of *Ptychodus*, although the adaptation to durophagy probably appeared independently in these two lonchidiid lineages. The current data would thus favour an origin of the Ptychodontidae in the Early Cretaceous of Asia, possibly in freshwater environments. This hypothesis needs however further evidence on their phylogenetic relationships and their evolutionary history to be formally proposed.

ACKNOWLEDGEMENTS

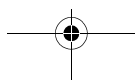
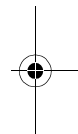
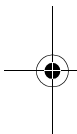
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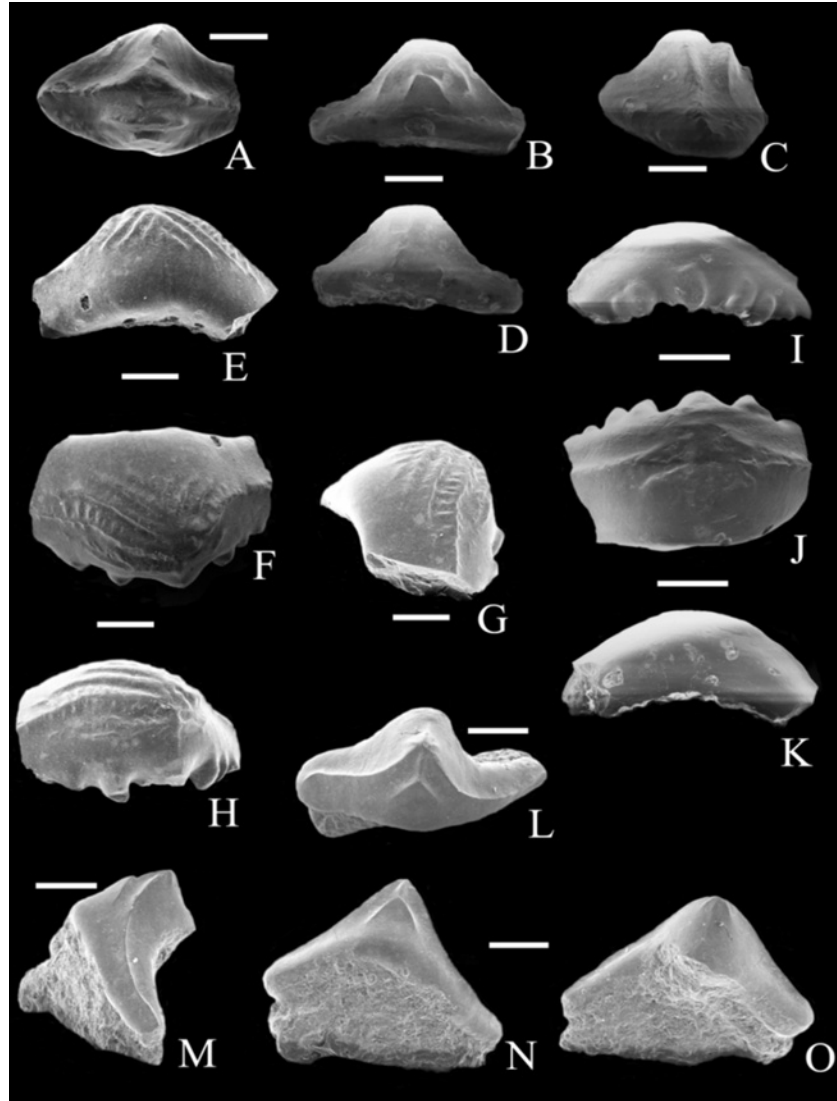


Figure 1. *Isanodus paladeji*. **A – D:** Presumed anterior tooth, paratype (TF 7671) in: **A**, apical; **B**, lingual; **C**, mesial or distal; and **D**, labial view. **E – H:** Presumed anterolateral tooth, paratype (TF 7672) in: **E**, lingual; **F**, apical; **G**, mesial or distal; and **H**, labial view. **I – K:** Presumed posterolateral tooth, paratype (TF 7673) in: **I**, labial; **J**, apical; and **K**, lingual view. **L – O:** Presumed posterior tooth, holotype (TF 7674) in: **L**, apical; **M**, distal; **N**, lingual; and **O**, labial view. Scale bars on A-H and L-O represent 500 μ m; scale bars on I – K represent 1 mm.