



## A primitive istiodactylid pterosaur (Pterodactyloidea) from the Jiufotang Formation (Early Cretaceous), northeast China

XIAOLIN WANG<sup>1</sup>, DIOGENES DE ALMEIDA CAMPOS<sup>2</sup>, ZHONGHE ZHOU<sup>1</sup> & ALEXANDER W. A. KELLNER<sup>3</sup>

<sup>1</sup>Laboratory of Evolutionary Systematics of Vertebrates, Institute of Vertebrate Paleontology and Paleoanthropology, Chinese Academy of Sciences, PO Box 643, Beijing, 100044, China.

E-mail: xlinwang@263.net

<sup>2</sup>Museu de Ciências da Terra/Departamento Nacional de Produção Mineral, Avenida Pasteur 404, Rio de Janeiro, RJ, 22290-240, Brazil

<sup>3</sup>Setor de Paleovertebrados, Museu Nacional/UF RJ Quinta da Boa Vista s/n., São Cristóvão, Rio de Janeiro, CEP: 20940-040.

E-mail: kellner@mn.ufrj.br

### Abstract

A new pterosaur, *Hongshanopterus lacustris* gen. et sp. nov., from the Early Cretaceous Jiufotang Formation, western Liaoning, China is described. The specimen (IVPP V14582) consists of a skull preserved in palatal view and some isolated cervical vertebrae. Based on the labiolingually compressed teeth with a triangular crown *Hongshanopterus lacustris* is referred to the Istiodactylidae. It presents several plesiomorphic features such as the teeth not confined to the anterior third of the skull but extended more posteriorly, and is thus considered the most primitive member of this group. This new species also differs from other istiodactylids by having more teeth, some showing the crown distinctively directed posteriorly. Three other members of the Istiodactylidae are currently represented in the Jiufotang deposits: *Nurhachius ignaciobrito*, *Istiodactylus sinensis* and *Longchengpterus zhaoi*. To those we add *Liaoxipterus brachyognathus*, previously classified in the Ctenochasmidae but that also has triangular labiolingually compressed teeth, and is a potential senior synonym of *Longchengpterus zhaoi*. The palatal anatomy of *Hongshanopterus lacustris* also agrees with previous hypothesis that considers Istiodactylidae more closely related to the Anhangueridae than to *Pteranodon* (or Pteranodontidae).

**Key words:** Pterosauria, Pterodactyloidea, Istiodactylidae, Liaoning, Early Cretaceous, China

### Introduction

The Early Cretaceous Jehol deposits are known worldwide for large quantities of fossils, some showing very well-preserved soft tissues (for a review see Chang *et al.* 2003 and Zhou *et al.* 2003). Divided into the Yixian and Jiufotang formations, the fossil material from those layers rivals and partially supplants that from other important fossil *lagerstätten* such as the Early Cretaceous Crato and Romualdo members of the Santana Formation, Brazil (Maisey 1991; Kellner *et al.* 1994; Kellner & Campos 1999; Frey *et al.* 2003; Brito & Gallo 2003) and the Late Jurassic Solnhofen limestone of Germany (Hecht *et al.* 1985).

Among the most interesting fossils recovered from the Jehol deposits are pterosaurs. Some specimens of these extinct flying reptiles have integumentary structures (Wang *et al.* 2002) and other soft tissue (e.g., Lü 2002; Wang *et al.* 2007), contributing to our knowledge of their external and internal anatomy for so long restricted to limited material from a few localities (e.g., Unwin & Bakhurina 1994; Kellner 1996; Frey *et al.*