Dataset

3D models related to the publication: Evidence for high-performance suction feeding in the Pennsylvanian stem-group holocephalan *Iniopera*

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Abstract

The present 3D Dataset contains 3D models of the cranial, visceral, and pectoral endoskeleton of *Iniopera*, an iniopterygian stem-group holocephalan from the Pennsylvanian of the USA. These data formed the basis for the analyses carried out in Dearden *et al.* (2022) "Evidence for high-performance suction feeding in the Pennsylvanian stem-group holocephalan *Iniopera*" PNAS.

Keywords: chondrichthyan, holocephalan, iniopterygian, Pennsylvanian, suction feeding

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Inv nr.	Taxon	Description
KUNHM 22060, 158289	*Iniopera sp.*	Head endoskeleton.

Table 1. Related model. Collection: University of Kansas Natural History Museum (KUNHM), Lawrence, Kansas, USA

INTRODUCTION

Living holocephalans (chimaeras) comprise only six genera of highly anatomically conservative, durophagous, mainly deep-sea dwelling fishes. Contrastingly, in the Carboniferous (359-299 Ma) holocephalans' early relatives displayed a wide array of anatomies and presumed feeding modes. The fossils that preserve these anatomy are usually flattened, obscuring our understanding of these fishes' roles in Carboniferous ecosystems. In the associated manuscript (Dearden *et al.* 2023) we used rare, three-dimensionally preserved remains of the Carboniferous holocephalan *Iniopera* to investigate its functional morphology, and find evidence that unlike any living holocephalan it was a high performance suction feeder. This study was based on 3D models of the endoskeleton of *Iniopera*, presented here (Fig. 1 and table 1).

METHODS

The 3D models were originally extracted in Mimics (Materialise) as described in (Pradel, 2010; Pradel et al., 2021, 2010, 2009), from specimens KUNHM 22060 and 158289 from the University of Kansas Museum of Natural History. The models provided here are as described in Pradel *et al.* 2021, and have not been retrodeformed and repositioned as described in Dearden *et al.* 2023. For modified models see the.blend files in the supplementary materials of Dearden *et al.* 2023. The 3D surface models are provided in .ply format, which is openable with a wide range of freeware". Images in Figure 1 rendered in Blender (blender.org).

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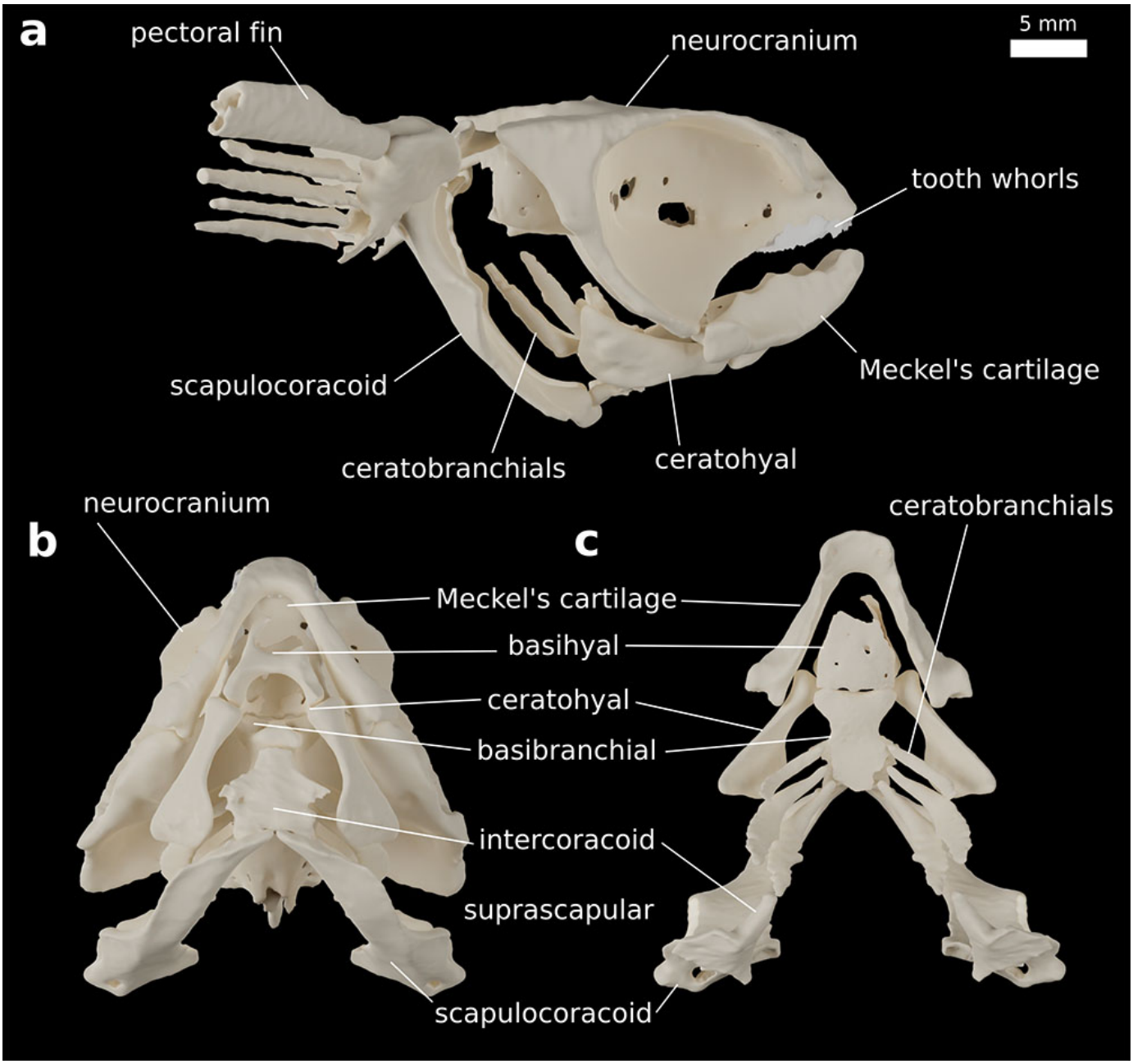

Figure 1. A reconstruction of the endoskeleton of the iniopterygian *Iniopera*. A, Lateral view, B, Ventral View, C, Dorsal view of visceral and pectoral skeleton with neurocranium removed.

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