

## An Advanced Massive Dipnorhynchid Lungfish from the Early Devonian of New South Wales, Australia

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**ABSTRACT.** *Dipnorhynchus kurikae* is a large dipnoan of Zlichovian age from limestones at Wee Jasper, New South Wales. Its skull roof is very broad posteriorly, narrow rostrally, has a pineal foramen opening through a single 'D' bone and a small number of bones in front of 'D'. The palatal and mandibular tooth plates are massive. The species is a close relative of *D. sussmilchi*.

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**KEYWORDS:** Dipnoi, Devonian, evolution, *Dipnorhynchus*.

Several highly significant fossils were found closely associated in the Zlichovian Limestones at Wee Jasper, New South Wales (Fig. 1). Among these were a partial skull roof, palate and mandible of a massive dipnoan. Subsequently another fragment of a skull roof and two partial palates were recovered from the same locality. A similar large mandible had been found at this locality several years previously but it had been regarded as a gerontic individual of *Dipnorhynchus sussmilchi* (Campbell & Barwick, 1983). The skull fragments and three palatal fragments, which are all of comparable dimensions, provide enough data to demonstrate that a more advanced form than *D. sussmilchi* is represented. Using the criteria usually applied in the differentiation of genera and species of Devonian Dipnoi, this material is described as a new species.

### SYSTEMATIC PALAEOLOGY

#### *Dipnorhynchus kurikae* n. sp.

Figs 2–10

The holotype is ANU35674, the posterior part of a skull roof; paratypes ANU35675, 36508–36510 and 36519 are a partial skull roof, three partial palates and a snout respectively; ANU35643 and AMF64832 are partial mandibles. All come from the shore of Burrinjuck Dam, Goodradigbee River (Fig. 1).

The species is named in honour of Dr Elga Mark-Kurik who discovered the first skull roof fragment.

**Formation and Age.** From the transition between

the Bloomfield and *Receptaculites* Limestones, Goodradigbee River, Wee Jasper, N.S.W. One of the specimens occurs about 10 m higher in the section than the others, and is within the *Receptaculites* Limestone. Zlichovian.

**Diagnosis.** Large species. Width to length ratio of skull high, this ratio for the palate being ca. 1.5. Large 'K' not extending between 'X' and 'L'. 'I' bones meeting behind 'B'. Pineal foramen open. One to three 'D' bones present. One to three 'L' bones depending on size of 'K'. Bones 'M' and 'N' large. Rostrum narrow. Palate exceptionally thick and transverse across the articular region. Small anterior median palatal bone embraced within paired 'dermopalatines', and all fused to the pterygoids. Dentition consisting of bulbous masses similar to those of *D. sussmilchi*. Dentine thin over most of the palate but thicker on the marginal ridges and the bulbous 'teeth'. Mandible very long medially and with a very powerful symphysis; ratio of median length/total length ca. 0.70. Anterior furrow deep, and divided by a forward extension of the 'adsymphysial' plate, at least in large adults. 'Dentary' very short on the ventral side of the mandible but with long dorsolateral extensions around the anterior furrow. 'Spleniials' and 'postspleniials' long and narrow. 'Surangular' deep and long, extending forwards to the anterior end of the labial pit. Massive bulbous tuberosities on the heel of the 'prearticulars' and smaller elongate teeth immediately behind the anterior furrow. Marginal ridge on the dentary continuous with that on the anterior end of the 'prearticulars'. Dentine thicker on the marginal ridges and bulbous teeth than elsewhere.