

# A new stem tetrapod from the Early Carboniferous of Northern Ireland

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## Abstract

We report on the first Carboniferous tetrapod specimen discovered in Northern Ireland, and one of the most primitive tetrapods known from the UK. The specimen consists of a partial left jaw ramus showing sufficient features to diagnose it as a new taxon. The specimen was discovered in 1843 by Portlock, described as *Holoptychius* and housed with the British Geological Survey. Recent work on tetrapodomorph lower jaws has shown that this specimen belongs to an undoubted tetrapod that bears resemblances to deep-skulled forms such as the whatcheeriids and *Crassigyrinus*. The precise locality is uncertain, but it probably derives from a site near Maghera, County Londonderry. Palynological evidence is equivocal, ranging from late Tournaisian through early Westphalian. The Altagoan Formation, from which most of Portlock's material seems to have been collected, is usually regarded as late Tournaisian or early Viséan (Courseyan or Chadian). The specimen is almost certainly older than those from Jarrow in Eire (Westphalian A), and is certainly more primitive than any tetrapod described from there. The specimen extends the geographical range of known Early Carboniferous tetrapods, which have now been found much further west in the British Isles than previously reported, and suggests the possibility of further discoveries in this region.

The jaw displays a distinctive character combination, including coronoids with an organised tooth row, lack of postsplenial-prearticular contact, an open mandibular lateral line sulcus, and a stepped rather than straight dentary-angular suture. A preliminary analysis of lower jaw characters places the new taxon in the neighbourhood of "*Tulerpeton*" (late Famennian jaw material from Andreyevka, Russia) and *Whatcheeria*, above all other Devonian tetrapods, and below *Crassigyrinus*, *Greererpeton*, *Megalocephalus* and an anthracosaur-temnospondyl clade. It may belong to an early and wide-ranging post-Devonian tetrapod radiation.

## Introduction

In 1843, Portlock described a series of fossils from the area around Londonderry in Northern Ireland, in his Geological Survey report on Londonderry, Tyrone and Fermanagh. Among these was a portion of a lower jaw that he figured as a specimen of *Holoptychius* (PORTLOCK 1843: pl. xiii, fig. 13a,b). In recent years, work on lower jaws by the authors (AHLBERG & CLACK 1998) has shown consistent characters by which tetrapod jaws can be distinguished from those of closely related lobe-finned fishes, and that these characters evolved in an ordered sequence. As a result of these studies, it is clear that Portlock's '*Holoptychius*' jaw is that of a primitive tetrapod. A cladistic analysis indicates that this specimen fits into the upper part of the tetrapod stem group, above *Acanthostega* and *Ichthyostega* but below *Crassigyrinus*, colosteids and baphetids; it shows particular similarities to the jaws of the whatcheeriids *Whatcheeria* (LOMBARD & BOLT 1995) and *Pederpes* (CLACK 2002a), and to the isolated jaw elements associated with *Tulerpeton* (LEBEDEV & CLACK 1993). This makes the jaw not only the most westerly but also one of the most primitive known from the British Isles. It seems to belong to a grade of organisation that is distinctively Early Carboniferous in character with some features in common with Devonian forms and some with later Carboniferous forms. Like *Pederpes*, the recently described Tournaisian whatcheeriid from Dumbarton in Scotland (CLACK 2002a) this jaw ramus extends the known geographical range of Carboniferous tetrapods and suggests the existence of a new locality from which significant material might be recovered.

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