

Crossopterygian Fishes from the Devonian of Antarctica: Systematics, Relationships and Biogeographic Significance

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ABSTRACT. Four new genera of osteolepiforms and a new rhizodontiform genus are described from the Middle-Late Devonian Aztec Siltstone (Beacon Supergroup) of Antarctica. Other indeterminate osteolepid, eusthenopterid and rhizodontid remains, and a single indeterminate porolepiform scale, are described from the same formation. *Koharalepis jarviki* n.gen., n.sp. is a large cosmine-covered osteolepiform with a broad flat head, two pairs of dermosphenotics, large extratemporals, a large postorbital in the cheek which does not reach the orbit, an elongate jugal, lachrymal separating the maxilla from the premaxilla at the jaw margin, and large anteriorly pointed median and triangular lateral extrascapulars. It is placed with *Canowindra* Thomson and *Beelarongia* Long in the new family Canowindridae. *Platyethmoidia antarctica* n.gen., n.sp. is a poorly known form with a very broad, flat fronto-ethmoidal shield with dorsomesially oriented slit-like nares, and a lower jaw with a deep articular region. It may be closely related to *Gyroptychius? australis* Young & Gorter. *Mahalalepis resima* n.gen., n.sp. is interpreted on the morphology of the fronto-ethmoidal shield as an early megalichthyid, and a new definition of this family is presented. *Vorobjevaia dolonodon* n.gen., n.sp. is a poorly known osteolepid with a distinctive jaw morphology. The rhizodontiform *Notorhizodon mackelveyi* n.gen., n.sp. was the largest fish in the Aztec fauna, attaining a length of over 3 m. It is characterised by elongate frontals and small dermosphenotics in the skull, *Rhizodus*-type tusks, and strong tooth flanges on the coronoid and dermopalatine series bones in the jaws. The braincase in a rhizodontiform is described for the first time, and in general morphology closely resembles that of Osteolepiformes. *Notorhizodon* resembles *Screbinodus* Andrews in dermal ornament and *Barameda* Long in skull pattern. All previously described crossopterygian material from the Aztec Siltstone is revised, and *Gyroptychius antarcticus* (Smith Woodward) is regarded as a *nomen nudum*. The stratigraphic distribution of rhipidistians in the Aztec Siltstone is summarised, and the biogeography and phylogenetic relationships of the