

An Unusual Micromorphic Brachiopod from the Middle Cambrian of North-Eastern New South Wales, Australia

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ABSTRACT. *Anomalocalyx cawoodi* new genus and new species, from Middle Cambrian (Floran-Undillan) allochthonous limestone clasts of the Murrawong Creek Formation, north eastern New South Wales, is characterised by a deep, tapering, conical ventral valve with a pair of simple teeth, an arched pseudodeltidium, well defined radial costae, crossed at more or less regular intervals by continuous concentric growth lamellae, and a presumed calcium carbonate shell composition, all suggesting an affinity with the Brachiopoda. *Anomalocalyx cawoodi* also possesses a number of unusual morphological features including an elongate, tapering interior tube extending along the inner posterior margin of the ventral valve, under the pseudodeltidium, that may be interpreted as a spondylium. Though possible cnidarian and molluscan affinities are fully explored, the weight of available evidence suggests the affinities of *A. cawoodi* are with the Brachiopoda.

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Williams *et al.* (1996) erected five new classes of brachiopods united by a number of shared synapomorphies within the subphylum Rhynchonelliformea including, (a) the presence of a pair of calcareous shells held together by an articulatory device at the posterior hinge line between the two shells, (b) an acoelomic pedicle core, and (c) the presence of a diductor system to control the opening of the shells. Williams *et al.* (1996) placed another calcareous class, the Craniata, characterised by a lack of articulation and functional pedicle, in a separate “inarticulate” subphylum. All five rhynchonelliform classes are represented in the Cambrian radiation and display a wide

range of unusual morphological adaptations, particularly with regard to valve articulation, musculature and pedicle opening (Popov, 1992; Popov *et al.*, 1996; Williams *et al.*, 1996). Typical morphological variations manifest in these early groups include the development of simple, presumably primitive, articulation mechanisms as exemplified by early obolellids (such as *Bicia* Walcott), kutorginids and nisusiids (Roberts & Jell, 1990; Popov, 1992; Popov *et al.*, 1996), and the evolution of unique features in a number of short-lived taxa. Examples of such features include the unusual spoon-shaped apical plate and supporting pedestal in the ventral valve of the naukatid genera *Bynguanoia* Roberts