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Dendroid and Tuboid Graptolites from the Llandovery (Silurian) of the Four Mile Creek Area, New South Wales

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ABSTRACT. Twenty-four taxa of Llandovery (Early Silurian) dendroid and tuboid graptolites from the Cadia Coach Shale and Glendalough Formation in the Four Mile Creek area, S of Orange, New South Wales, provide the most diverse benthic graptolite record known from rocks of this age.

Eighteen new taxa described here are: the dendroids *Dendrograptus avonleaensis, D. ashburniaensis, Dictyonema williamsae, D. paululum australis, D. jenkinsi, D. muirae, D. warrisi, Callograptus bridgecreekensis, C. rigbyae, C. ulahensis, Stelechocladia praeattenuata, Acanthograptus praedeckeri, A. praedeckeri minimus, Thallograptus christoffersonae, Koremagraptus obscurus* and *C. elegantulus*; and the tuboids *Reticulograptus thomasi* and *Cyclograptus*? *australis*. The six previously-named taxa are: *Dictyonema* cf. *delicatulum* Lapworth, *D. falciferum* Bulman, *D. venustum* Lapworth, *Callograptus* cf. *niagarensis* Spencer and *Pseudodictyonema graptolithorum* (Počta); and one species in open nomenclature is *Dictyonema* sp. 1. These occur with graptoloids at Four Mile Creek, allowing precise stratigraphic correlation of the faunas with probably the *gregarius* Biozone (middle Llandovery), and the *crispus* and *griestoniensis* Biozones (late Llandovery) of Europe.

Criteria for dendroid classification are discussed and some implications for reconstructing the evolutionary history of the group are reviewed. The evolution of anastomosis and dissepiments is seen as of prime importance in the development of three major changes in the Middle to Late Cambrian, which are: 1, ordered *Dendrograptus* → *Callograptus*: 2, ordered *Dendrograptus* → *Dictyonema*; 3. ordered *Dendrograptus* → *Desmograptus*. The development of compound stipes, while important in defining the Acanthograptidae, is recognized as having arisen independently in three other lineages.

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