

Equisetalean Plant Remains from the Early to Middle Triassic of New South Wales, Australia

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ABSTRACT. Equisetalean fossil plant remains of Early to Middle Triassic age from New South Wales are described. Robust and persistent nodal diaphragms composed of three zones; a broad central pith disc, a vascular cylinder and a cortical region surrounded by a sheath of conjoined leaf bases, are placed in *Nododendron benolongensis* n.sp. The new genus *Townroviamites* is erected for stems previously assigned to *Phyllothea brookvalensis* which bear whorls of leaves forming a narrow basal sheath and the number of leaves matches the number of vascular bundles. Finely striated stems bearing leaf whorls consisting of several foliar lobes each formed from four to seven linear conjoined leaves are described as *Paraschizoneura jonesii* n.sp. Doubts are raised about the presence of the common Permian Gondwanan sphenophyte species *Phyllothea australis* and the Northern Hemisphere genus *Neocalamites* in Middle Triassic floras of Gondwana.

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The plant Phylum Sphenophyta, which includes the equisetaleans, commonly known as “horse-tails” or “scouring rushes”, first appeared during the Devonian Period (Taylor & Taylor, 1993). By the Carboniferous Period the Sphenophyta had reached their greatest degree of diversity, when, as semi-aquatic or swamp-dwelling scramblers, small herbaceous plants or even trees to 20 m in height, they formed a prominent part of the vegetation of the coal swamps of northern Pangaea, or, what is today, Europe and North America (Boureau, 1964). During the

Permian Period, the increasing aridity and decline in the vegetation of northern Pangaea was in contrast to that in southern Pangaea—Gondwana—where flourishing swamp forests of the *Glossopteris* Flora were producing some of the world’s greatest coal reserves. A limited range of sphenophytes (Townrow, 1955; Rigby, 1966; McLoughlin, 1992a,b; Holmes, 1995) including *Phyllothea australis*, a significant contributor to the formation of the coal (Beeston, 1991; McLoughlin, 1993) and fodder for dicynodont mammal-like reptiles (Rayner, 1992), were associated with *Glossopteris*.