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Discovery of Fossilized *Spenophyllum* sp of Permian Period in the Tabbowa Sedimentary Basin: Sri Lanka

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Abstract

Plant fossil bearing mudstones of the Mesozoic era are present at a small and deeply faulted basin within the Precambrian Basement at Tabbowa in the Northwestern Province of Sri Lanka. There is only a limited number of studies available on these plant fossils, particularly on their morphological characterization and their systematic positioning in the plant world. Their palaeo geography, age or prevailing palaeo-climatic conditions have not been clearly established. Weathering on outcrops appeared to have eliminated possibility of a clear undertaking of palaeo-stratigraphic analysis of the exposed strata, though deep subsurface strata may yield clear evidence, even spore-pollen assemblages. So far, only the plant macrofossils are considered means of dating these strata. The present study is on *Sphenophyllum*; a group of extinct plant species, from the Permian (298-252 MY ago) deposits of the Tabbowa basin. The fossils are well preserved, hence allowing detailed morphological analysis, taxonomy, and palaeo-ecological insights. These fossils are recognized by their jointed stems and leaves arranged in whorls (circlets) at nodes. Leaves row in whorls around the stem at each node and are typically triangular or wedge-shaped with veins branching from the base and multiple veins that are radiated from the base of each leaf and branch repeatedly to the tip. Some taxonomic characters and venations of leaves were studied under the microscope. The observed features are compatible with museum specimens so far recovered from India, Australia and Antartctica and information published in literature *Sphenophyllum* has fan-shaped lobed leaves attachment for efficient photosynthesis in relation to climate. The leaf Taxonomic features mainly the leaf's margin, size, shape, texture, petiole and venation density have helped in determining past climate. The results revealed that these species do not show any strong taxonomic or morphological evidence of either arid or humid climates but appear to grow as members of hydrophilous plant communities in shallow waters. The findings propose that this association of species of Lopingian age in the Permian period and are compatible with the fossil floras of Peninsula India.

Keywords: *Sphenophyllum, Permian plant fossil, Tabbowa basin, Sri Lanka*