An Early Paleocene Microflora from Turtle Mountain, Southwestern Manitoba

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Background

The spore and pollen flora of the Early Paleocene Goodlamb Member of the Turtle Mountain Formation is reported from west of Turtle Mountain in southwestern Manitoba (Fig. 1) from in situ lignite and mudstone from stream-bank outcrops (Fig. 2), and from spoil heaps of abandoned coal mines. Ongoing research on these sediments will include samples from core-holes drilled as part of previous investigations by the Manitoba Geological Survey and the Geological Survey of Canada (Fig. 1). Presented here are a brief overview of the geological setting and preliminary findings on the palynology of these sediments.

Geological Setting

The Turtle Mountain area is a plateau, 90 m to 120 m above the surrounding countryside and contains Manitoba’s only Cenozoic sediments found in outcrop. Stream-banks and ravines on the western flank of Turtle Mountain have exposed these sediments from the small overburden of Tertiary tills and soils (Fig. 2). The Early Paleocene marine shales and terrestrial mudstones are distinguished by the presence of diagnostic dinoflagellates (McIntyre, 1999; Braman et al., 1999). The rare occurrence of fossil leaves from the Peace Garden Member along the North West flank of Turtle Mountain suggest shallow near shore facies grading to transient terrestrial swamp environments at the margins of the intercontinental seaway (Bamburak, 1978).

Preliminary Work & Project Goals

The pollen slides were prepared by the GSC Palynology Laboratory in Calgary using standard palynological procedures (Sweet, 2005; Traverse, 2007). The presence of Mamipites microfoveolatus, Triclolporopollenes kruschi [= Margarocporites cristaellus] (Fig. 3–28), and rare occurrences in some samples of Wodehousea fimbriata (Fig. 3–5) in the palynoflora are consistent with an Early Paleocene age (Braman and Sweet, 1999). Some samples were assignable to the late Early Paleocene Triclolporopollenes kruschi Zone. The Turtle Mountain microflora represents a record of Early Paleocene vegetation from northeast of the Williston Basin of Montana, North Dakota and Saskatchewan. The microflora is dominated by grains of T-C-T conifers (e.g. Fig. 3-11), but also contains a diverse suite of other gymnosperms (rare Ginkgo, Sequoia, and Pinaceae), angiosperms (e.g., Betulaceae, Juglandaceae and Ulmaceae), and both moss and pteridophyte spores (Fig. 3) (Sweet, 2005). Some samples were rich in bisaccate conifer grains (e.g. Fig. 3-7).

Current research towards an Honours thesis by M. Desautels involves identification and counts of the microflora from multiple samples to reconstruct the coal-swamp vegetation across the Early Paleocene landscape. These results will be contrasted to the analysis of the Early Paleocene coals from the Estevan coal mine, SK (Frank and Bend, 2004).

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References