Identification of new vertebrate diversity within the Scots Bay Member of the Early Jurassic McCoy Brook Formation, Wasson Bluff, Cumberland County, Nova Scotia

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The McCoy Brook Formation at Wasson Bluff near Parrsboro, Cumberland County, is now recognized as one of the most productive sites for preservation of small terrestrial vertebrates and dinosaurs immediately following the end-Triassic mass extinction. Syn-depositional faulting along the margin of the Minas Basin rift basin resulted in rapid topographic changes and positive sedimentation, preserving abundant faunal remains from several distinct ecosystems. Today, there is very rapid erosion (~1 m / year) of the coastal sandstone cliff exposures due to the extreme tidal range in the Bay of Fundy. The abundance of fossils and rate of erosion provide a unique opportunity for continuous collecting of new fossil specimens and detailed facies mapping.

During the past five years the “fish-bed” of the Scots Bay Member at Wasson Bluff has experienced particularly rapid erosion that has exposed new bedding features and fossil specimens. In 2008, approximately 5 kg of sediment samples from a rapidly eroding “fish bed” layer were collected (NS Heritage Permit# P2008NS02) for laboratory processing for small vertebrate remains. Processing of the sediment was completed in a separate study that identified a productive processing methodology. The current study reports on several significant specimens that were identified in the matrix samples prior to processing.

Three specimens of particular significance include an isolated serrated (theropod) dinosaur tooth, a small and elongate cervical vertebrae from a small, possibly juvenile dinosaur, and a dentary of the tritylodontid cynodont *Oligokyphus*. The three specimens preserved in the layer rich in semionotid scales and hybodont shark teeth, which suggests a shoreline depositional facies, with detailed sedimentological context being considered elsewhere. The identification of *Oligokyphus* is a first report of a tritylodontid cynodont in the Fundy Basin and further supports the earliest Jurassic age of the fauna.

Computer tomography (CT) examination of the *Oligokyphus* dentary fragment provides additional anatomical details of the root morphology of the well preserved in situ tooth as well as the posterior (empty) socket. Taphonomic details of all three specimens provide additional evidence for paleo-shoreline deposition of the currently exposed beds of the Scots Bay Member of the McCoy Brook Formation. The results demonstrate the importance of continuing collecting from this unit, especially considering the ecological context of these paleo- shoreline facies at a time of biological recovery following the end-Triassic mass extinction.

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