

# Acritarchs in Cambrian and Lower Ordovician Rocks of Nova Scotia and New Brunswick, Canada: New Constraints on Correlations and Paleogeography<sup>1</sup>

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Most of the 200 samples collected from Avalonian Cambrian and Lower Ordovician sequences in Nova Scotia and New Brunswick, as well as age-equivalent units in the Meguma terrane of southern Nova Scotia, have yielded acritarchs. Preliminary results show that they include taxa not reported previously from western Avalonia (Newfoundland), and indicate revised stratigraphical ranges for several taxa, thus increasing potential for stratigraphic comparisons and regional and global correlations, in particular to Baltica and northern Gondwana. Well-preserved material was obtained from the upper part of the MacLean Brook Formation (early Furongian) in the Mira River area of southeastern Cape Breton Island, including *Petaloferidium lacrimiferum*, *Stelliferidium albanii* and *S. magnum* and the first record in western Avalonia of *Pireia orbicularis*, a species which permits precise correlation to Baltica and northern Gondwana. Acritarchs from the MacNeil Formation in the Mira River area include *Cristallinium randomense* and *Stelliferidium cortinulum*. These findings suggest that any stratigraphic gap between the MacLean Brook Formation and the overlying MacNeil Formation is smaller than previously interpreted. In New Brunswick, the classic Lower to Middle Cambrian Hanford Brook section yielded acritarchs throughout the sequence. The upper half of the Ratcliffe Brook Formation (Early Cambrian) contains *Archaeodiscina umbonulata* and abundant *Skiagia ornata*, *S. orbiculare* and *S. scottica*. This assemblage of acritarchs has a global first appearance generally thought to be close in time to the rise of trilobites, potentially in conflict with the established view that all of the Ratcliffe Brook Formation is pre-trilobitic. The upper part of the Hanford Brook Formation yielded well-preserved material of *Comasphaeridium silesiense*, *Heliosphaeridium notatum*, *Eliasum llaniscum* and *Liepania plana* taxa with a first appearance close to the base of the Middle Cambrian. Further studies of the Hanford Brook section promise to help constrain the age and regional correlation of the *Protolenus elegans* Trilobite Zone, which at present are problematic. Acritarchs from the middle part of the King Square Formation include *Eliasum llaniscum*, *Timofeevia lancarae*, *Cristallinium cambriense*, *C. dubium* and *Polygonium sp.* This assemblage suggests that the medusoid-bearing portion of the King Square Formation is late middle Cambrian (Cambrian series 3) and probably older than *Agnostus pisiformis*. Acritarchs close to the transition between the King Square and Silver Falls formations include *Petaloferidium lacrimiferum*, *Stelliferidium albanii* and *S. magnum*, consistent with correlation to the MacLean Brook Formation in the Mira River area, but not to its upper part. In the Meguma terrane of southern Nova Scotia, acritarchs have been recovered from various levels of the Halifax Group in sections at Bear River and Black River. Preliminary identifications include several species of *Acanthodiacrodium*, *Veryhachium* and *Stelliferidium trifidum*, consistent with the Tremadocian age for this unit inferred from a sparse graptolite record. Acritarchs offer possibility for better constraints on the age of the upper part of the Halifax Group.

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