

## Vertebrate and invertebrate trace fossils from the Horton Bluff Formation (Lower Carboniferous) near Avonport, Nova Scotia

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The Blue Beach and Hurd Creek members of the Horton Bluff Formation (Horton Group) contain a variety of vertebrate and invertebrate trace fossils from Tournaisian sandstone and shale. They are best preserved as convex hyporeliefs on indurated sandstone. The present study is concentrating on fish, amphibian, and certain arthropod traces from the eastern Annapolis Valley region.

Fish swimming too close to the bottom were responsible for sinusoidal traces left by tail, fin, and spine drags. These trails are attributable to the ichnogenus *Undichnus* Anderson and are found associated with arthropod traces, amphibian footprints, coprolites, fish scales, and Acanthodian fish spines. *U. britannicus* Higgs is represented by two unpaired waves with different amplitudes but similar wavelengths that were produced by caudal and anal fins. *U. binus* Anderson is represented by one set of paired waves produced by pelvic fins. Two additional trails are not attributable to any known ichnospecies. *U. isp. 2* consists of one or two discontinuous waves, 180° out of phase with respect to crescent shaped marks that may represent tail and pectoral fin traces. *U. isp. 3* consists of three sets of paired asymmetric waves bounding

an unpaired medial wave. Paired pelvic fins and an anal fin probably made these markings.

Several trackways resembling those of modern and fossil scorpions and spiders are found in association with sinuous trails and other arthropod traces, suggesting that they were made in an aquatic environment. These traces are believed to be the oldest known of their kind in Canada. Most of these trackways are attributable to *Paleohelcura* Gilmore and consist of 2 to 4 circular or oval pits with or without a medial tail (?) drag mark. *P. tridactyla* Gilmore consists of alternating groups of 2 or 3 pits arranged in a line so that their long axis is diagonal to a medial tail (?) drag mark. In following with the International Code of Zoological Nomenclature, the trackways may instead be associated with the ichnogenus *Protichnites* Owen and *Diplichnites* Dawson. At least one other large form may also be present.

The amphibian traces are being studied at present. They consist of several kinds of footprints and trackways and include rare tail drag marks. These traces may represent the only Tournaisian amphibian tracks in the world, and the oldest of the most diverse amphibian material ever reported.