

The first unambiguous pterygote ichnofossil from the Joggins Fossil Cliffs, UNESCO World Heritage Site, Joggins, Nova Scotia, Canada

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A discovery made in the Pennsylvanian-aged Springhill Mines Formation in 1989, by Don Reid “The Keeper of the Cliffs” and his son Doug Reid, at Dennis Point within the Joggins Fossil Cliffs UNESCO World Heritage Site, of a dragonfly-like paleodictyopterid (Megasecoptera) has been re-interpreted as the first unambiguous winged-invertebrate ichnofossil at the site. After its discovery, this fossil became the emblem for Don Reid’s Fossil Centre and remains on display at the new Joggins Fossil Centre.

The terrestrial invertebrate fossil record at Joggins is best represented by ichnofossils. Globally the pteralious invertebrate ichnofossil record is almost non-existent with the exception of some landing traces that are represented by appendage impressions (i.e., *Tonganoxichnus* and *Rotterodichnium*). The specimen of interest here is the only known unambiguous example of a winged trace fossil that demonstrates the anatomical details of the trace maker, and is the first definitive evidence of flying invertebrates at Joggins, despite depictions dating back to writings by Sir William Dawson which were based on a putative compound insect eye preserved within a tetrapod coprolite. One additional carbonized wing fragment identified as Paleodictyopterid has since been found.

The trace fossil is here discussed and tentatively interpreted as the body impression (cubichnia) of a winged invertebrate, righting itself after an inverted landing into soft sediment that may preserve a microbial surface. The fossil lacks carbonized remains, and shows no evidence of a compressed thorax, appendages or cephalon. The posteriorly shallowing dorsal impression has four deep wing impressions and a curved abdomen impression that exhibits drag impressions suggesting movement. The anteriorly deepening wing impression and abdomen drag is consistent with traces left by a modern dragonfly dislodging itself from wet sediment.

Don Reid’s contribution to the growing knowledge of the Joggins Fossil Cliffs spans nearly a century. If correct, the re-interpretation of this specimen as a trace fossil of Megasecoptera has implications for its taxonomic status, and it would be only fitting to name it in his honour.