Three-dimensional identification and orphological characterization of a Trichichnus-like trace fossil

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The ichnogenus *Trichichnus* is recognized as branched to unbranched, straight to sinuous, cylindrical burrows interpreted as the Domichnia (dwelling structures) of meiofaunal deposit-feeding vermiform, or a crustacean-like organism. These burrows are less than 1 mm in width, and are mostly vertical with respect to bedding. *Trichichnus* can be found in sedimentary strata from the lower Tremadoc to Holocene, and is an indicator of marine palaeoenvironments. *Trichichnus* is also identified to be eurybathic, meaning it can be found in both deep- and shallow-water settings. Most reports are however, from shallow-water settings. *Polykladichnus* is an ichnogenus morphologically similar to *Trichichnus*, and is characterized by vertically oriented burrows with Y- to U-shaped branching that point upwards to the surface. Junctions of these branched burrows tend to be slightly larger in diameter. These branches are mostly connected at bedding surfaces, and the burrow fill is generally finer-grained than the surrounding sediments. *Polykladichnus* is not a strictly marine trace fossil, however it is dominantly found in a marine facies. The aim of this study is to identify the trace fossils collected from the Bell Island sample by constructing a high resolution three-dimensional morphological model of the ichnofossil burrows. The sample collected from the Power Steps Formation in Grebes Nest point, Bell Island, contains many closely spaced vertical burrows that are study in this project, that are considered to be either *Trichichnus* or *Polykladichnus*. This identification will be achieved through the use of serial grinding techniques, high-resolution digital photography, and the three dimensional modeling software. The model created by this method will help better the morphological variability within the present material, which seems to show some characteristic elements of both ichnogenera. In addition, the model will also be used to assess whether the burrows were gregarious in life, and caused sediment-trapping functions to produce bioherms in the manner of modern *Sabelleria* "worm reefs".

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