Early Palaeozoic Deep-Water Flysch Ichnocoenoses

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Traditional and currently-held views and models of Early Palaeozoic flysch trace fossil assemblages (ichnocoenoses) emphasize low diversities in comparison to their neritic counterparts. Such models predict between as few as 1-3 forms for Cambrian, 4-8 forms for Ordovician and 4-8 forms for Silurian flysch sequences. Such low diversities are equated to the gradual build-up and development of behavioural patterns through the Phanerozoic concomitant with the establishment of deep-water benthic epifaunal and infaunal taxa. Superimposed on this gradual build-up, according to the models, is a rapid diversity

increase at the start of the Mesozoic, which is generally equated to the coeval but rapid development of calcareous and foraminiferal oozes and, or, the growth of cellulosic debris that reached the ocean floor.

Over the last decade or so, several Early Palaeozoic flysch sequences have been examined with respect to their contained ichnofossils. These sequences comprise a wide range of interpreted deep-sea flysch environments and therefore, presumably, exhibited considerable variation in primary environmental parameters responsible for the distribution of their associated benthic organisms, as revealed by the preserved ichnotaxa. Four Early Palaeozoic flysch sequences from eastern Canada and their associated ichnotaxa are considered here: the Cambro-Ordovician Meguma Group of Nova Scotia (basin/fan/slope), and from New Brunswick, the Middle Ordovician-Early Silurian Matapedia Group (slope) and Grog Brook Group (?channel) and the Early Silurian Siegas Formation (canyon). These sequences contain (at the ichnogeneric rather than ichnospecific level, on which the models were based) relatively diverse ichnotaxa, respectively 18, 22, 16 and 18 ichnogenera. The trace fossil diversity of each of these sequences is therefore not in accord with existing models which suggests that such models should be regarded with caution and are in need of serious revision. It is likely that Early Palaeozoic deep-sea trace fossil diversity cannot be obtained simply by plotting totals for various flysch formations and that the real patterns are masked, amongst other things, by local environmental and preservational factors.