

U–Pb zircon–rutile dating of the Llangynog Inlier, Wales: Constraints on an Ediacaran shallow-marine fossil assemblage from East Avalonia

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The Llangynog Inlier of south Wales preserves a shallow-marine assemblage of Ediacaran macrofossils, including discoidal morphs of *Aspidella*, *Hiemalora*, and *Palaeopascichnus*. These are taxa found at other shallow-marine Avalonian microcontinent sites of eastern Newfoundland and in younger White Sea Ediacaran assemblages. As the Charnwood Forest fossils, which share some of these forms, represent a deep-water environment and the Long Mynd shallow marine to fluvial succession lacks Ediacaran macrofossils, the Llangynog Inlier offers a unique insight into shallow-marine Ediacaran life of southern Britain (East Avalonia). However, the absence of radiometric age constraints for the Llangynog Inlier has hindered comparisons with other fossil assemblages. This study presents *in-situ* zircon and rutile U–Pb dates obtained from a rhyolitic ash-flow layer within the Coed Cochion Volcaniclastic Member of the Llangynog Inlier. A weighted mean single grain zircon isotope dilution thermal ionization mass spectrometry U–Pb age dates the fossils to 564.09 ± 0.70 Ma. This age is corroborated by laser ablation inductively coupled plasma mass spectrometry zircon and rutile U–Pb dating, which yields an age of 563 ± 6 Ma. These ages are coeval with dated horizons within East Avalonia, such as the Beacon Hill Formation in Charnwood (565.22 ± 0.89 Ma), Stretton Shale Formation, Long Mynd (566.6 ± 2.9 Ma), and the Fermeuse Formation of the St John's Group in eastern Newfoundland (564.13 ± 0.65 Ma). Our data confirm the biota of the Llangynog Inlier as a lateral equivalent to the similarly shallow-marine, tidally influenced ecosystem of the upper Fermeuse Formation. Ultimately, variations in depositional environment conditions within Avalonian terranes impact the preservation of Ediacaran fossils.