

UPPER VENDIAN SKELETAL FOSSILS OF THE ARROYO DEL SOLDADO GROUP (URUGUAY): NEW EVIDENCES ON THE CAUSES OF THE CAMBRIAN EXPLOSION

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The Yerbal Formation of the Arroyo del Soldado Group (Nico Pérez Terrane, Uruguay) contains the only diverse Precambrian skeletal fauna known to date. The age of this assemblage is Upper Vendian (Valdaian), determined on the basis of acritarch biostratigraphy, occurrence of *Cloudina riemkeae*, and preliminary C-isotopic data. Rb/Sr and K/Ar datings of intrusive granitoids and recrystallization of illites provide a minimum age boundary of 535Ma. The assemblage consists of at least five genera and species. *Cloudina riemkeae* occurs partly in living position in banded siltstones. *Titanotheca coimbrae* is characterized by an agglutinated, uni- or bilocular test made up of minute rutile- crystals, and is interpreted as an agglutinated foraminifera. *Waltheria marburgensis* has a septate, multilayered, branched shell, of probably phosphatic composition. The species *Soldadotubulus siderophoba* shows some affinities with *Waltheria*, but it occurs only as steinkerns. Finally, discoidal steinkerns of uncertain classification are assigned to *Palaeodiscus mendezalzalai*. The combination of palaeontological and sedimentological data suggests that the advent of skeletons in the Vendian might have occurred as a response to predation by shell-borers, under quite hostile environmental conditions. These include severe ocean stratification and evidence of at least two cold episodes, identified in the Arroyo del Soldado Group. Once these conditions ceased in the Lower Cambrian, an explosive radiation of skeletal species took place. Therefore, while the advent of skeletons is explained as a consequence of selection pressure, its explosive development responds to significant environmental change at the