



Tracking tetrapod diversification during the Paleozoic in western Gondwana

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The oldest record of amniotes in Gondwana corresponds to the Artinskian (Cisuralian) mesosaurids, an endemic group of aquatic “parareptiles” only known from western Gondwana. It is not until the Wordian-Capitanian (Guadalupian) that fairly diverse amniote faunas are known from southern Africa. During the Paleozoic, the record of non-amniotes tetrapods is even more erratic. Particularly in western Gondwana, they are known from Pennsylvanian temnospondyl footprints from Chile and only since the Lopingian rich temnospondyl faunas are well known from several Gondwanan basins. In the last years, levels containing tetrapod footprints have been described from putative Cisuralian-Guadalupian beds of Argentina (La Rioja and La Pampa provinces). These records show the presence of different groups of tetrapods, mostly represented by small individuals, and have been assigned to both amniote and temnospondyl trackmakers. Also from Permian levels but in southern Mendoza (San Rafael), several tetrapod footprints and trackways have been recently re-evaluated. They revealed a rather diverse amniote fauna, which includes small-to-medium sized animals, developed in a desert environment. The importance of this record has been recently reinforced as the bearing levels were assigned to the Artinskian, the same age of the mesosaurid-bearing levels. This new scenario has important implications for understanding the patterns of diversification of the Gondwanan tetrapod faunas during the Paleozoic as it would imply that amniotes were already widespread in western Gondwana by the beginning of the Permian with both fully terrestrial and specialized aquatic forms.

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