XVIII IX
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STRATIGRAPHY AND SEDIMENTOLOGY OF LACUSTRINE-DELTAIC DEPOSITS OF AGUA DE LA ZORRA FORMATION (TRIASSIC), NW ARGENTINA

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Carbonate rich lacustrine-palustrine deposits are a relevant paleoenvironmental proxy worldwide because they represent good records of tectonism, climate, and global environmental conditions. This work focuses on the Agua de la Zorra Formation, which is part of the Triassic continental infill of the Paramillos de Uspallata sub-basin, within the Cuyana rift Basin (NW Argentina). This basin is one of the fault-bounded rift basins developed during the break-up of Pangea along the western margin of Gondwana during the Triassic. It comprises different asymmetric half-grabens, being one of them Paramillos de Uspallata. In that area, the Triassic deposits extend laterally N-S for 12 km. Previous radioisotopic dating (K/Ar) of the Agua de la Zorra basalts threw an age between 235 ± 5 Ma and 240 ± 10 Ma (Upper-Middle Triassic-Lower Upper Triassic). Our goal is to provide a high resolution stratigraphic, sedimentological and limnogeological analysis of the Agua de la Zorra formation and to characterize the carbonate factory of the system unravelling the external factors that conditioned the sedimentation in the area such as volcanisms, tectonics and/or climate. The unit is 43-145 m thick and consists of siliciclastic, mixed and carbonate deposits representative of deltaic to lacustrine-palustrine environments. We present five high resolution sedimentary successions (L1 to L5) that spatially cover the complete outcrop and we have identified 3 parasequences in each one of them (P1-P3). Parasequences are shoaling upward and we have identified five facies associations: delta front (FA1); prodelta (FA2); lake margin (FA3); lake center (FA4) and volcanic episodes (FA5). They are laterally continuous and can be mapped across the studied area. FA3 contains two carbonates microfacies: massive mudstone consisting of micrite and cemented mudstones formed by a fibro-radial spar mosaic. P1 is 12-20 m thick and presents lake margin facies as massive carbonates, cemented carbonates and finely laminated argillaceous mudstones with root traces and desiccation cracks. P2 consists of 43-72 m thick massive conglomerates and sandstones with trough cross, ripple cross and horizontal lamination interbedded with massive and laminated argillaceous siltstones of the delta-front and prodelta facies association. The P3 is 17 m thick and shows the widest expansion of the lake center and lake margin facies associations. In that part of the succession, siliciclastic input of the prodelta facies association is restricted to the northern area of the paleolake. The three described parasequences present volcanic episodes that consist in interbedding discontinuous basalts and laterally continuous tuffs (FA5); in P1 the cemented carbonate mudstones are in contact with the basalts. The stacking pattern is progradation-retrogradation characterizing an overfilled lake basin type. Up section and across the 5 logs we recognize an expansion and migration of the lake system from North to South. This can potentially be linked to the tectonic evolution of the half-graben in a progressive extension following the NNW-SSE rifting general trend of the Cuyana rift Basin. Regarding the carbonates described, the massive calcareous mudstones would result from precipitation in subaqueous low energy conditions; the cemented carbonate mudstones would be linked to the change in the hydrochemistry of the lake system due to the effects of basalts.