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## MULTI-PHASE FILLING PROCESS IN THEROPOD AND SAUROPOD DINOSAUR FOOTPRINTS FROM THE CANDELEROS FORMATION AT VILLA EL CHOCÓN, PATAGONIA ARGENTINA

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The area surrounding Villa El Chocón (Neuquén province, Argentina) constitutes a huge ichnosite where dinosaur footprints were reported from playa-lake facies of the Cenomanian Candeleros Formation. This unit stands out for its rich and diverse tetrapod body- and ichno-fossil record, the latter including footprints attributed to sauropods, theropods, ornithopods, and pterosaurs. Despite studies conducted on the ichnofauna, processes presiding footprints' formation and preservation were underinvestigated. A track-bearing surface, preserving large sauropod and tridactyl footprints attributed to theropods, was recently unearthed, allowing characterize how these tracks were formed and included into the geological record. Conformable contact between two horizons enabled identify the tracking surface that, as the underlying subsurface, was made up of fine-grained sands displaying wrinkle structures. Both sauropods and theropods, while crossing, broke the paleosurface, which was stabilized by microbial mat and in subaerial conditions. Producers' autopods passed through the underlying, medium- to coarse-grained sandy layers, to a depth of 50 cm maximum. Wide and thick displacement rims associated to tracks suggest high cohesiveness and plasticity of the substrate. A first filling event of the newly formed underprints started synchronously to autopodia recovery, with the detachment of sediments from the sole of producers' feet. Tracks remained temporarily uncovered and were finally blanketed by dark grey, micaceous silts displaying small-scale, cross-laminated ripples with symmetrical and straight morphology, sedimented in a lacustrine environment. Our reconstruction highlights the pivotal role that understanding of footprint formation and preservation plays in addressing questions about footprints ichnotaxonomy, as well as palaeobiology and palaeoecology of trackmakers.

