IV Simposio Latinoamericano de Icnología

SLIC 2018

OCTUBRE 7-14

Santa Marta, Colombia

MEMORIAS (Resúmenes)

GUÍAS DE EXCURSIÓN (Intra y post-simposio)

Dinosaur Tracks From The Aptian (Early Cretaceous) of Araripe Basin, Brazil

Ismar de Souza Carvalho[1,4], Bruno Gonçalves Vieira de Melo[1], Leonardo Borghi[1], Aristóteles de Moraes Rios-Netto[1], José Artur Ferreira Gomes de Andrade[2], Francisco Idalécio de Freitas[3]

[1] Universidade Federal do Rio de Janeiro, Centro de Ciências Matemáticas e da Natureza, Instituto de Geociências, Departamento de Geologia, Avenida Athos da Silveira Ramos, 274, Bloco F, Ilha do Fundão – Cidade Universitária, Rio de Janeiro, RJ, 21949-900, Brazil. [2] Departamento Nacional da Produção Mineral, Ceará´, Praça da Sé, 105 Centro, 63.100-440 Ceará, Brazil.
[3] Geopark Araripe, Rua Carolino Sucupira s/n, Pimenta, 105 Centro, 63.100-490 Ceará, Brazil.
E-mails: [4] ismar@geologia.ufrj.br

The Araripe Basin presents one of the largest outcrop areas of Cretaceous rocks (12,200 km^2) among the northeastern Brazilian intracratonic basins. The basement is constituted of magmatic and metamorphic rocks. The basin is filled with conglomerates, sandstones, siltstones, shales, mudstones, marls, limestones, gypsum and anhydrite. The lithostratigraphic subdivision of these rocks has been discussed and reviewed by many authors, and the most widely accepted terms for the lithostratigraphic units are the Cariri, Brejo Santo, Abaiara, Missão Velha, Rio da Batateira, Santana and Exu formations. The Cretaceous history spans from Berriasian to Aptian times, and until now footprints have been identified only at one location. The isolated prints of theropods, and one print of a probable ornithopod occur in a fine-grained sandstone interbedded with coarse sandstones within the Cariri Formation. This unit was originally considered as part of a Palaeozoic depositional cycle. In the present study we acknowledged new occurrence of Aptian sediments that shows fossil footprints in the Araripe Basin.

Fossil tracks are preferentially found in fine-grained sediments, such as purely terrigenous and carbonatic mudstones. This suggests that environments where fine-grained sediments are dominant provide a better settling for footprint preservation, as occurs in the Crato Member of Santana Formation (Aptian, Araripe Basin), lithostratigraphic unit of the new record of dinosaur tracks.

Footprints may have a low preservation potential, since surface impressions in soft sediments are readily eroded and destroyed as the succeeding bed is deposited. The possibility of preservation is minimal during long-lasting periods of exposure without any sedimentation and favoured by rapid and significant preservation events. This means that in environments of cyclic sedimentation, footprints are most commonly preserved.

The dinoturbation tracks were found in the Crato Member of Santana Formation. The range size varies from 35 cm to 100 cm in length and 30 cm to 50 cm depth. They were founded in fine-grained sandstones intercalated with shales related to flooding areas of alkaline lakes. There was subaerial exposure of these surfaces allowing them to suffer dinoturbation. The pressure occurred during the contact of a dinosaur autopodia and the substrate, led to the deformation of the upper surface of the sediments, with the origin of load structures accompanying a concave aspect with successive laminae deformation.

By the time the trails found in the Crato Member were produced - probably by large sauropods - there was a hyperpicnal stream in the intermittent lake and the weather was hot and humid. Thus, the assumed interpretation is that the dinosaur tracks were produced in the lake's surrounding margins. Successive flooding, and subsequent sediment influx, with the stabilization by early cementation and by the network of mat fabric over the tracks, allowed their preservation.

The authors gratefully acknowledge support from Shell Brasil Petroleo Ltda. (Project *Stratigraphic Correlation, Paleoenvironmental and Paleogeographic Evolution, and Exploratory Perspectives of the Alagoas Stage, Brazil*), and the strategic importance of the support given by ANP (Brazil's National Oil, Natural Gas and Biofuels Agency) through the R&D levy regulation.