

SAUROPODS CROSSING FORMATIONS: BIOSTRATIGRAPHICAL IMPLICATIONS FOR PATAGONIAN FAUNAL ASSEMBLAGES

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The Neuquén Basin contains the most prolific sequence with remains of sauropod dinosaurs in South America, and displays the greater number of valid species. Thus, it is preferable to be used as a basis for comparison with other sedimentary basins of South America. Different faunal sequences schemes has been proposed to include Cretaceous sauropods and another vertebrates from the Neuquén Basin and some times the rest of Patagonia. Bonaparte (1992) proposed the use of Land Vertebrate Ages (L.V.A.), namely the Neuquenan and Alamitian. Posteriorly, Leanza et al. (2004) dismissed the use of L.V.A. and proposed the creation of successions of local tetrapod assemblages (L.T.A.), which are based in stratigraphical units, as formations and subgroups: Amargan (La Amarga Formation), Lohancuran (Lohan Cura and Rayoso Formations), Limayan (Río Limay Subgroup), Neuquenan (Río Neuquén Subgroup), Coloradoan (Río Colorado Subgroup), and Allenian (Allen Formation and equivalent units). The characterization of these include changes in the composition of suprageneric sauropod taxa, as Rebbachisauridae, Eutitanosauria or Saltosaurinae. A first problematic issue with the L.T.A. as currently defined is the direct correlation between change of depositional unit and change in assemblages. In the case of sauropods, the existence of Rebbachisauridae is evidenced from the Amargan to the Limayan and absent in the Neuquenan and posterior L.T.A. The absence and probable extinction of Rebbachisauridae then is inferred to occur in the limit between the Limayan and the Neuquenan. The last sauropod fossils (and last evidence of rebbachisaurids) recorded during the Limayan is in the middle part of the Huincul Formation, and the following sauropod fossil record is located in the upper part of the Portezuelo Formation, then the lapsus between these two levels can not characterize any of the tetrapod assemblages. The same is true for all the limits between tetrapod assemblages. A second problem is constituted by mistakes in the characterization of the tetrapod assemblages based in misinterpretations of the stratigraphic provenance of fossils and in the absence of fossil record (ghost lineages). The first case is evidenced by MUCPv 204, a basal titanosaurid with amphiplatian mid-caudals. This form was considered by Leanza et al. (2004) as coming from the Neuquenan, but our investigation demonstrates that this sauropod came from the base of the Bajo de la Carpa Formation, then discarding the absence of basal forms during the Coloradoan, which at the moment is correct only for the top of the Bajo de la Carpa and base of Anacleto Formations. Finally, the existence of long-range ghost lineages are evident in several clades of titanosaurids, as Aeolosaurini, which is recorded in the Allenian but shares a minimum common origin with the Rinconsauria, which are reported in the Neuquenan. Many of these problems can be reduced using species-level taxa for reference and reducing the assemblages to well-known local faunas (not to the entire formational sequence). To accomplish this purpose, the sauropod species can be utilized as indicators of equivalent age.

Bonaparte, J.F. 1992. Una nueva especie de Triconodonta (Mammalia) de la Formación Los Alamitos, Provincia de Río Negro y comentarios sobre su fauna de mamíferos. *Ameghiniana*, 29: 99-110.

Leanza, H.A.; Apesteguía, S. Novas, F.E. & de la Fuente, M.S. 2004. Cretaceous terrestrial beds from the Neuquén Basin (Argentina) and their tetrapod assemblages. *Cretaceous Research*, 25: 61-87