

New large ornithopod tracks from the Yacoraite Formation (Maastrichtian-Danian), northwestern Argentina

Ignacio Díaz-Martínez¹, Silvina de Valais¹, Carlos Cónsole-Gonella²

¹ CONICET–Instituto de Investigación en Paleobiología y Geología, Universidad Nacional de Río Negro, Isidro Lobos 516, General Roca (8332), Río Negro, Argentina. 54-0298-4427399. inaportu@hotmail.com; sdevalais@yahoo.com.ar

² CONICET–Instituto Superior de Correlación Geológica (INSUGEO) – Universidad Nacional de Tucumán. Miguel Lillo 205, Tucumán, Argentina.

The term “large ornithopod tracks” is normally used to name tracks with the following features: tridactyl, mesaxonic, clover-like tracks with wide digits and rounded ends, digits converging proximally into a broad metatarsophalangeal impression or “heel pad”, and similar in anteroposterior and mediolateral dimensions. Latest Cretaceous large ornithopod tracks are very abundant in North America and Asia, but their record is very scarce in Europe and Gondwana. There are only four Campanian-Maastrichtian Gondwanan large ornithopod track records, all of them from South America (Argentina, Peru and Bolivia). Two of these sites are from the Valle del Tonco, Salta province, Argentina, in the Yacoraite Formation; where the ichnotaxa *Hadrosaurichnus australis* Alonso 1980, *Taponichnus donottoi* Alonso and Marquillas 1986, and *Telosichnus saltensis* Alonso and Marquillas 1986, originally related to ornithopod dinosaurs, were defined. Recently, three new large ornithopod track-bearing surfaces have been discovered in the Yacoraite Formation, two of them are in the Valle del Tonco, and the third is in Maimará, Jujuy province, Argentina. This formation is considered Maastrichtian-Danian in age on the basis of palaeontological and isotopic data. It is composed of carbonates and siliciclastic sediments that represent an epicontinental sea that covered the most part of northwestern Argentina. The palaeontological record is abundant but scarce in diversity as is typical of a stressed environment, with fluctuations in salinity and oxygenation. Both the Valle del Tonco and Maimará localities belong to two different shoreline positions at the basin: the northwestern Tres Cruces sub-basin and the southwestern Alemania sub-basin, respectively. This aspect is remarkable, because these depocenters are located almost 300 km apart, with a palaeogeographic barrier in between, the Salta-Jujuy dorsal. The new Valle del Tonco large ornithopod tracks are mesaxonic, tridactyl, subsymmetrical, and have one pad impression in each digit and in the heel. The tracks are not well preserved and are classified as *Iguanodontipodidae* indet. There is a partial trackway from the Maimará locality, composed of at least four large ornithopod tracks and probably two associated hand prints. The clearest footprint is characterized by having a large and bilobed heel impression and wide and short digit impressions with blunt claw traces. These features allow assigned it to *Hadrosauropodus* Lockley et al. 2003. Previous records of *Hadrosauropodus* are from Laurasia and this is the first record of this ichnotaxon from Gondwana, expanding the geographic range of this ichnogenus. A member of *Hadrosauridae* is emphasized as possible trackmaker of the uppermost Cretaceous large ornithopod tracks. *Hadrosaurid* dinosaurs are scarce in Gondwana, being the bone record limited to Patagonia, La Pampa province and Antarctica. The tracks from the Yacoraite Formation represent the majority of large ornithopod tracks of Gondwana and increase the knowledge on Gondwana *Hadrosauridae* dinosaurs.