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The first poposaurid record (Archosauria: Rauisuchia) from the Los Colorados Formation (latest Triassic), La Rioja Province, NW Argentina

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The tetrapod assemblage coming from the upper levels of the Los Colorados Formation (late Norian-Rhaetian, La Rioja Province) has provided a diverse and abundant record of an archosaur-dominated fauna. In particular, the currently available record shows that crurotarsans is the taxonomically most diverse group, with five described species, the aetosaur *Neoaetosauroides* Bonaparte, the rauisuchid *Fasolasuchus* Bonaparte, and the crocodylomorphs *Hemiprotosuchus* Bonaparte and *Pseudhesperosuchus* Bonaparte. In this contribution we provide the reappraisal of an ilium (PULR 076) found in direct association with the holotype of the basal neotheropod *Zupaysaurus* Arcucci and Coria, from Quebrada de Los Jachaleros, upper levels of the formation. This bone was previously recognized as a probable basal saurischian, but clearly not pertaining to the holotype of *Zupaysaurus*. Nevertheless, we reinterpret this element as belonging to a poposaurid rauisuchian. The bone can not be referred to Dinosauria because it lacks a brevis shelf, brevis fossa, and a high and thin iliac blade. By contrast, PULR 076 presents the following synapomorphies of Poposauridae: first sacral rib articulating extensively with the anteriorly pointing crest of the ilium, supra-acetabular crest with an anteriorly extending crest, and a postero-dorsally oriented post-acetabular process. In addition, this specimen exhibits a suite of autapomorphies which allow distinguishing it from other archosaurs (thick and laterally convex iliac blade and strongly dorsoventrally low and slightly medially deflected post-acetabular process) Accordingly, this specimen seems to be a new poposaurid species which increases the already high diversity of one of the youngest known crurotarsan-bearing assemblages.

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A medium-sized basal abelisauroid with well-developed manus from the Late Cretaceous of southern Patagonia

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Late Cretaceous Gondwanan outcrops provide abundant abelisauroid theropods. Medium- to large-sized members of the group represent them as characterized by reduced forelimbs supplied with highly atrophied hands (*e.g. Carnotaurus* Bonaparte, *Aucasaurus* Coria *et al*., *Majungasaurus* Lavocat). This panorama changes with the discovery of a new medium-sized basal abelisauroid (MPM-PV 10003) coming from the latest Cretaceous (Maastrichtian) Pari Aike Formation, Santa Cruz Province, Argentina. MPM-PV 10003 preserves a metacarpal III, manual non-ungual phalanx, mid-caudal vertebrae, metatarsals II and IV, distal end of tibia, and pedal phalanges. Although fragmentary, the new specimen preserves an autapomorphic metacarpal III with a dorso-ventrally compressed shaft and posteriorly displaced collateral fossae, and pedal phalanges with a conspicuous longitudinal crest delimitating the dorsal margin of the collateral fossae, allowing distinction of MPM-PV 10003 from other neotheropods. Cladistic analysis recovered the new species as more derived than *Ceratosaurus* Marsh and *Berberosaurus* Allain *et al*., but within a polytomy at the base of Abelisauroidea. This assignment is supported by synapomorphies (distal end of tibia with a vertical facet for reception of the astragalar ascending process and a scar of the ascending process bearing a median vertical ridge). The manus of MPM-PV 10003 presents a metacarpal with a long shaft and well-developed distal pulley and a phalanx with well-developed distal articulation. Information provided by MPM-PV 10003 suggests that the strong reduction of the forelimb recorded in derived abelisaurids is not directly correlated with body-size increase; it seems to be an evolutionary event exclusive of this lineage within Ceratosauria.

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Huella tridáctila de la Formación Misiones (Cretácico Inferior), Departamento de Misiones, Paraguay

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Aunque el registro de vertebrados paleozoicos y cenozoicos de Paraguay es abundante, los hallazgos de fósiles mesozoicos son casi nulos. La excepción era la mención de dos rastrilladas de vertebrados halladas en lajas de las explanadas

de las iglesias Catedral y María Auxiliadora (ambas de Asunción), procedentes de una cantera del Departamento de Misiones, SE-S de Asunción, y pertenecientes a la sección superior de la Formación Misiones (Cretácico Inferior). Estas rastrilladas se encuentran actualmente desaparecidas. Recientemente, en otra laja de la explanada de la iglesia María Auxiliadora, procedentes de la misma cantera, fue hallada una huella tridáctila de mediano tamaño, con conservación pobre debido a erosión mecánica y con bajo relieve (PFU-001a, réplica de yeso, Colección de paleontología, Facultad de Ciencias Exactas y Naturales, Universidad Nacional de Asunción, Paraguay). La huella mide 154 mm de largo y 130 mm de ancho y es cuasi simétrica lateralmente. Las impresiones de los dígitos tienen largos relativamente similares entre sí, y un ángulo de divaricación total de 43°, con improntas de garras triangulares y marcas de almohadillas digitales débilmente impresas. El talón o borde proximal de la huella tiene un contorno levemente triangular. La icnita exhibe características propias de las huellas de terópodos: más larga que ancha, impresiones de los dígitos relativamente largas y angostas, marcas de garras y divaricación total relativamente baja. La traza constituye, hasta la fecha, la única prueba fidedigna sobre la presencia de dinosaurios en Paraguay y plantea nuevos datos sobre la paleoecología de la unidad portadora.

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Cretaceous dinosaurs liked spas: affinities of neosauropod nesting-sites with hydrothermal paleoenvironments

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Although several Late Cretaceous dinosaurs nesting sites have been discovered world-wide, the biological and paleoenvironmental triggers behind the selection of these nesting localities, have not yet been adequately investigated. Thus the factors that influenced the choice of selected colonial nesting sites by neosauropods still remain enigmatic. Herein we report for first time the stunning Sanagasta colonial nesting site in La Rioja Province, Argentina, a Cretaceous hydrothermal setting where a group of neosauropod dinosaurs came repetitively to ovideposit and specifically use the soil thermoradiance to incubate their eggs. Discovery of this new colonial nesting locality demonstrates nest fidelity over a long time and a symbiotic relationship between egg clutches and a peculiar hydrothermal environment that favored their incubation. Geochemical analyses, regional tectonisms, and field observations support a Cretaceous dating and synchronicity between the hydrothermal and nesting activities. This paleobehavior still is expressed in a few species of modern dinosaurs, namely the Polynesian megapode that buries its eggs in burrows at volcanically heated nesting sites. The Sanagasta discovery also implies associated migrations for reproduction and demonstrates a high dependency between reproductive characters/behaviors and a particular Cretaceous geological setting. Therefore, the selection of specific nesting site is an important element in the paleobiology of these sauropods and perhaps could have played a key role in their progressive extinction due to rapid environmental changes by the end of the Cretaceous.

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Redescription and relationships of *Meridiosaurus vallisparadisi*, a Late Jurassic/Early Cretaceous pholidosaurid crocodyliform from Uruguay

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Meridiosauris vallisparadisi was originally described as a pholidosaurid, a group of long-snouted neosuchians with aquatic and fish-eating adaptations. It was found in the fluvial fine- to medium-grained sandstone facies of the Tacuarembó Formation (Kimmeridgian-Hauterivian), NE Uruguay. In order to test the phylogenetic relationships of this taxon, we performed an osteological redescription, resulting in a great quantity of new characters, of which the most important are: external nares dorsally separated by the premaxillary bar; absence of a notch on the ventral edge of rostrum at premaxilla-maxilla contact; nasals not meeting premaxilla dorsally; sculptured region along alveolar margin on lateral surface of maxilla; sinusoidal premaxilla-maxilla suture in palatal view; nasal lateral edges oblique to each other, converging anteriorly; cheek teeth not constricted at the base of the crown; sinusoidal lateral contour of snout in dorsal view; presence of evaginations in the maxillary alveolar edges at each alveoli; 5th premaxillary tooth positioned laterally to maxillary