

**A PNEUMATIC CAVITY IN AN *ALAMOSAURUS* PUBIS: THE FIRST EVIDENCE OF PUBIC PNEUMATICITY IN SAUROPODOMORPHS AND THE IMPLICATIONS OF PELVIC PNEUMATICITY IN NEOSAUROPODS**

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LACM (Natural History Museum of Los Angeles County) 156591, a nearly complete sauropod left pubis, was recovered from the Naaishobito Member of the Ojo Alamo Formation of the Bisti/De-Na-Zin Wilderness, New Mexico (USA). *Alamosaurus* is thus far the only titanosaur recognized from the Upper Cretaceous strata in North America, so it is likely that these remains pertain to *Alamosaurus sanjuanensis* or a related species. The bone has a maximum proximo-distal length of 1210 mm and a proximal width of 840 mm; the iliac and ischiadic peduncles, and most of the shaft, are complete.

A large, triangular, distally-directed cavity, 35 mm long and 17 mm wide, pierces the ventral rim of the oval-shaped obturator foramen. Several sets of high-resolution computed tomography (CT) scans were taken of the cavity (pixel size of 0.5 mm). The cavity penetrates distally for approximately 27 mm before merging into a complex of small spaces within the bone. It is not presently clear whether these spaces are pneumatic camellae or large marrow-filled trabecular spaces. The margins of the cavity are smooth, finished bone, and the cavity itself was obscured by matrix and only discovered during preparation; it is not an artifact of breakage or preparation, and there is no evidence of pathology. Several lines of evidence suggest the cavity is pneumatic: large neurovascular foramina in the vertebrae of whales and ungulates are subcircular and connect to vascular canals that run through the bone. This cavity is triangular and does not connect to any persistent canals in the bone; it is similar to deep, non-ramifying pneumatic fossae in sacral vertebrae of *Haplocanthosaurus*. Also, primary neurovascular foramina in bones tend to be conserved; the absence of similar cavities in other sauropods is more consistent with the inherent variability of pneumaticity. Finally, the presence of this cavity inside the obturator foramen is consistent with the tendency of pneumatic diverticula in birds to follow neurovascular bundles.

This is the first instance of pneumatic invasion of the pubis in a sauropodomorph. The pelvic elements of birds are pneumatized by diverticula that surround the acetabulum. Pneumatization of the ilia in many derived neosauropods, the ischia in the rebbachisaurid *Tataouinea*, and now this pubis of *Alamosaurus*, suggest that similar pelvic diverticula were present in neosauropods. This discovery adds to an expanding body of evidence showing that pneumatic diverticula like those of birds were both taxonomically and anatomically widespread in non-avian saurischians.