

First record of a pterosaur landing trackway

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The terrestrial progression of pterosaurs, the flying reptiles of the Mesozoic Era, has been debated for over two centuries (Wellnhofer 1991, Bennett 1997). The discovery of undisputed quadrupedal pterosaur tracks in the Late Jurassic of Crayssac, France (Mazin et al. 2003) leaves no doubt that pterosaurs could progress on four legs, even though their hindlimbs are organized much like those of birds and other dinosaurs. In these trackways the manus print generally occurs outside the pes and slightly behind it. So as not to interfere with the wing, the manus was raised before the ipsilateral pes proceeded. The trackway pattern was LF-LH-RF-RH, contrary to the common tetrapod pattern (LF-RH-RF-LH) (Padian 2003). This pattern and other features suggest that pterosaurs were only secondarily quadrupedal. Their forelimb morphology and kinematics differ substantially from those of other animals.

We report the first known trackway of a pterosaur landing, also from the Late Jurassic sediments of Crayssac, France. In this sequence, the pterosaur, a small pterodactyloid (pes length ~ 5 cm), did not make a running landing. Rather, it apparently stalled before landing to slow its descent and speed, because the distance between successive footfalls is so short. It touched the ground lightly on its heels, dragged its toes slightly as it left the track, and landed again almost immediately on both feet in parallel. It then placed both manus on the ground. This was followed by a short step of adjustment by all the feet; then the animal began to walk normally. These functions are consistent with those of extant birds when landing. The trackway shows that pterosaurs stalled to land, a reflection of their highly developed capacity for flight and maneuverability (Witmer et al. 2003).

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