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Tracking Late Jurassic ornithopods in the Lusitanian Basin of Portugal: Ichnotaxonomic implications

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The Sociedade de História Natural in Torres Vedras, Portugal houses an extensive collection of as yet undescribed dinosaur tracks with ornithopod affinities. They have been collected from different Late Jurassic (Kimmeridgian–Tithonian) geological formations (Praia de Amoreira-Porto Novo, Alcobaça, Sobral, and Freixial) that outcrop along the Portuguese coast, and belong to two different sub-basins of the Lusitanian Basin (the Consolação and Turcifal sub-basins). Three main morphotypes can be distinguished on the basis of size, mesaxony and the morphology of the metatarsophalangeal pad impression. The minute to small-sized morphotype is similar to the Anomoepus-like tracks identified in other Late Jurassic areas. The small to medium-sized morphotype resembles the Late Jurassic–Early Cretaceous ichnotaxon *Dinehichnus*, already known in the Lusitanian Basin. Interestingly, these two morphotypes can be distinguished qualitatively (slightly different size, metatarsophalangeal pad impression and digit morphology) but are nevertheless difficult to discriminate by quantitatively analysing their length-width ratio and mesaxony. The third morphotype is considered a large ornithopod footprint belonging to the ichnofamily Iguanodontipodidae. This ichnofamily is typical for Cretaceous tracksites but the new material suggests that it might also be present in the Late Jurassic. The three morphotypes show a negative correlation between size and mesaxony, so the smaller tracks show the stronger mesaxony, and the larger ones weaker mesaxony. The Upper Jurassic ornithopod record from the Lusitanian Basin has yielded both small and medium-sized ornithopod remains, mainly iguanodontians such as dryosaurids and ankylopollexians, which are the main candidates to be the trackmakers.

Key words: Iguanodontipodidae, *Dinehichnus, Anomoepus*-like, Kimmeridgian, Tithonian, Europe.

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