

Taphonomy of the Ana site, Lower Cretaceous, Arcillas de Morella Formation, Cincorres, Spain

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Ana is one of the several dinosaur bone sites located in the Arcillas de Morella Formation (Aptian, Lower Cretaceous; eastern Iberian Chain, Spain). This geological formation is widely known by specialists because it has delivered an abundant and diverse collection of dinosaur remains (Galobart et al., 2003; Ortega et al., 2006). However, no justification has been provided up to date to explain the origin of such accumulations. Herein, we provide the first detailed study on the taphonomy of the Ana site, as a first step to elucidate the question of the taphonomic processes that accumulates this vertebrate fossils in this formation.

Taxonomically, Ana is dominated by disarticulated remains of Ornithopoda, which are usually fragmentary and abraded. Other taxa are also present (mostly Theropoda), but they conform minor elements of the fossil assemblage. Mineralogically, the sediment including the fossils contains grains of quartz, illite/mica, kaolinite/clorite, K-feldspar and plagioclase, distributed in two mainly grain populations, a silty-clay and a coarse sand size grain, indicating that the sediments were bedded in a low-medium energy depositional environment. Sedimentological features indicate that fossils were finally deposited in starved shallow estuarine environment, marine facies (Suñer et al., 2007). Mechanically, there is a statistical significant orientation of elongate elements and an apparent evidence of hydraulic sorting, accorded with the paleocurrents measured. In some cases, damage due to transport is also evident, but with signals that they did not covered a long distance. Thus, the bones were probably affected (rounded) by the action of the tidal currents in this shallow estuarine environment. Prior to the final buried, another event moved the material to the final place of preservation, indicating that many elements may have been reworked (spatial averaging and/or time averaging).

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