

A comparison of palaeopathological lesions and diseases between lower and upper cretaceous ornithopod dinosaurs

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Ornithopoda is the clade that show the highest prevalence of pathologies among the Dinosauria, especially in Cretaceous taxa. During this period, they reached a worldwide distribution, with a high occurrence of remains, from isolated bones to complete skeletons. Diseases and trauma are events that affect only a part of a given population, thus the more specimens one finds, the more pathological information can be retrieved. This data can finally unveil aspects linked to the behavior of the affected species, as well as their interaction with their environment. However, palaeopathological analyses were, and often still are, confined to case-studies. Hypotheses regarding ecological and phylogenetic influences can be assumed, however, using a substantial database of pathologies from a selected clade. During the Lower Cretaceous, the lands were dominated by Styracosternan dinosaurs such as *Iguanodon* and similar taxa. These animals show the highest number of palaeopathological lesions in the dorsal vertebrae, middle region of the tail, pelvic girdle and pedal phalanges. However, some lesions are considered as possible pseudo-pathologies. The pathological distribution in the “*Iguanodon*-like” body is low when compared to those of hadrosaurid dinosaurs of the Upper Cretaceous, especially in the northern American regions. These ornithopods show a very high amount of pathologies (about 1600 at least), with similar body distribution to earlier taxa, but with higher numbers in the trunk region, limbs and skull. The fact that neck is consistently the area with the fewest pathologies recorded is noteworthy, which is a sign of extremely low resilience. Although the ornithopod palaeopathological dataset is not yet complete, some conclusions can be drawn even when preservation and collection biases are considered: the tail was the area that suffered most from injuries, while osteochondrosis (aka, cartilage developmental failure) extensively affected hadrosaurid pedal phalanges, with no clear evidence in non-hadrosaurid iguanodontians. Analyses of further collections will extend the current dataset, thereby enhancing behavioral and ecological interpretations.