THE CRANIAL SCULPTURING OF ANKYLOSAURS (DINOSAURIA: ORNITHISCHIA): REAPPRAISAL OF DEVELOPMENTAL HYPOTHESES

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The presence of cranial sculpturing along the dorsal and lateral surfaces of the skull has long been considered diagnostic for the Ankylosauria. Sculpturing and the highly fused nature of the ankylosaur skull have limited our present understanding of cranial anatomy. Two alternative hypotheses have been proposed to explain the occurrence of cranial sculpturing. The most widely accepted idea is that overlying osteoderms have coössified with the skull roof. The alternative suggests that sculpturing is derived from the elaboration of the cranial periosteum. Evidence from the Late Cretaceous ankylosaurid *Euoplocephalus tutus* and comparative data from extant (non-dinosaurian) taxa demonstrating a similar condition supports the hypothesis of osteoderm coössification over most of the skull. The developmental model proposed involves the formation of osteoderms within the dermis under the influence of overlying epidermal structures. This can also explain the appearance of bony cheeks in some taxa. Subadult *Euoplocephalus* and *Pinacosaurus grangeri* fossils suggest that the bosses located at the posterior corners of the skull and over the orbits underwent a separate developmental history, involving elaboration of the periosteum. Therefore it r ıy be asserted that both developmental mechanisms operate, to some extent, i the formation of cranial sculpturing. Fragmentary skull material has provided new histological samples to augment the work conducted by Coombs in the early 1970's.