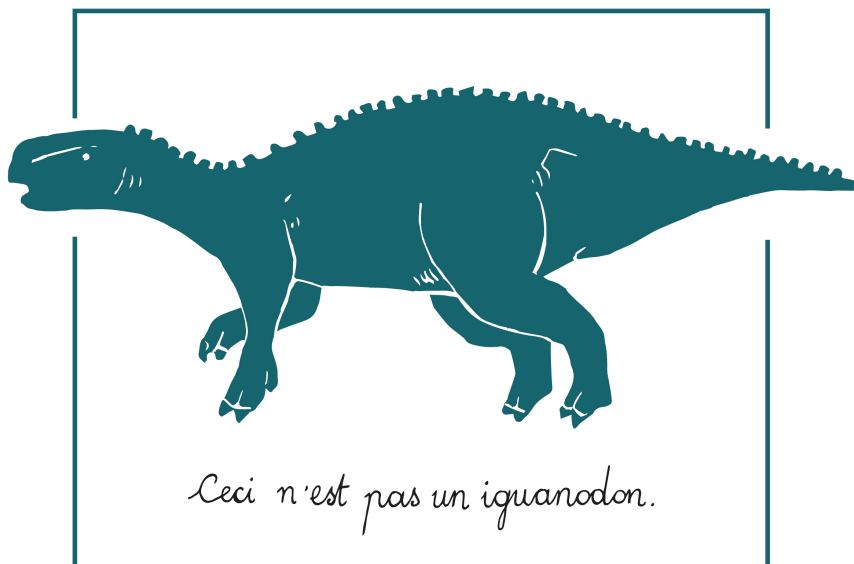




17th Conference of the EAVP • 2019 • Brussels



July 2 • 3 • 4 • 5 • 6 – Royal Belgian Institute of Natural Sciences

Bernissart workshop and field trip in La Malogne underground quarry
1st of July, 2019

XVII Conference of the EAVP – Brussels, Belgium
2 – 6 July 2019



HISTOLOGY AND GROWTH OF WEALDEN IGUANODONS FROM BELGIUM AND GERMANY

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Keywords: *Bernissart, bone diagenesis, bone histology, iguanodon, Nehden*

The genus *Iguanodon* comprises some of the earliest discovered dinosaur taxa. It acquired an iconic status when a large number of more or less complete skeletons was exhumed from a coal mine near Bernissart, Belgium. The skeletons represent the largest find of its kind in Europe, and their morphology has been studied extensively. However, these natural treasures are notably threatened by decay of the pyrite which is ubiquitously present in the skeletons, therefore continued action is needed to preserve them. Here we present results on the bone histology and preservation of *Iguanodon bernissartensis* and *Mantellisaurus atherfieldensis* from Bernissart (Belgium) and the contemporary bonebed locality of Nehden (Germany), from which hundreds of mostly disarticulated bones with similar preservation were uncovered. Our analytical approach (polarized light microscopy, μ XRF, FTIR spectroscopy, carbon and oxygen stable isotope analysis) demonstrates the morphological preservation of bony tissues, and presence of metal sulfides on the boundary of the medullary cavity and cortex and silicate minerals in the core of the medullary cavity. Pyrite has thus not penetrated the bony tissues themselves, which allowed assessment of the growth of this iconic taxon. Our bone histological results indicate iguanodons *Iguanodon bernissartensis* and *Mantellisaurus atherfieldensis* generally grew fast, likely reaching adult size within a decade. However, a clear difference in growth trajectory can be seen between *I. bernissartensis* and *Mantellisaurus*, justifying their taxonomic distinction. Finally, it should be noted that though some variation in histological maturity exists, no juveniles are known from Bernissart, whereas younger individuals (<50% max size) are clearly present in the Nehden assemblage.