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5th International Symposium on Lithographic Limestone and Plattenkalk

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Tetrapods from the Late Jurassic lithographic limestones and *Plattenkalke* of Western Europe: an updated comparative review

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Tetrapods from the Late Jurassic (Kimmeridgian–Tithonian) lithographic limestones and *Plattenkalke* of Western Europe have been deposited in protected costal marine environments of shallow carbonate platforms, on the Northern margin of the Tethys. These marine, costal marine and continental tetrapods have been in the focus of many detailed studies (e.g., the pterosaurs, the bird *Archaeopteryx*). Nonetheless, comparisons of the tetrapod assemblages at the regional (intracontinental) scale of Western Europe have attracted little attention, even though the excellent combination of a high-resolution stratigraphical frame and the abundance and exceptional preservation of the fossil material from this region offers a great potential in this regard. As noticed earlier by Broin et al. (1991) and Buffetaut (1994), the faunal resemblances (sometimes at the genus or species level) between sites of Franconia (Germany), Cerin and Canjuers (France) suggest that they belonged to a same biogeographical province. The widespread distribution of some small to medium-sized terrestrial tetrapods (e.g., the sphenodontid *Homoeosaurus*, atopusaurid crocodylians, the theropod dinosaur *Compsognathus*) indicates that land connections have existed throughout the region.

Buffetaut (1994) published a first descriptive study, mainly at the major group level, including the Late Jurassic assemblages of Franconia, Cerin, and Canjuers. He concluded to important resemblances and striking differences, the latter being explainable by different collecting histories, taphonomic biases, depositional environments, geological ages, and suggested that these tetrapod assemblages were unbalanced. Billon-Bruyat (2005) added three other Late Jurassic *Plattenkalk* localities to this comparison: Porrentruy (Switzerland), Solothurn (Switzerland) and Crayssac (France). He presented a qualitative comparison based on skeletal remains and ichnological (notably theropod and sauropod ichnites)

evidence, suggesting that the assemblages indicate balanced insular faunas. In addition, he attempted a quantitative study (cluster analysis, several similarity indices, UPGMA method) at the family level, showing that these communities are related but not as similar as previously thought.

Here, we report an update of this phenetic analysis, including the assemblage of the lithographic limestones of Nuspligen (Kimmeridgian, Germany), new specimens from Porrentruy (excavations in progress) and by testing the cluster analysis at the genus level. It comes out that the comparison is somewhat skewed by taxonomic problems. Even if the taxa chosen are assumed to be monophyletic, some groups need to be revised, at the genus and even at the family level (e.g., the turtles of the family “Plesiochelyidae”; see Joyce 2007). The resulting dendrograms confirm two major clusters, grouping the assemblages of “Franconia, Cerin, and Canjuers” and “Porrentruy and Solothurn” (a Swiss group). Nuspligen and Crayssac assemblages generally fall outside these two major clusters. At this time, the dendrograms seem to reflect more the different biases affecting the presence/absence of taxa than obvious fine-scale tetrapod palaeobiogeographic relationships.

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