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Dimorphism in Late Cretaceous ammonites—evidence from early Turonian ammonite faunas of the Brießnitz Formation in Saxony, Germany

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Systematic palaeontological and biometric-statistical analyses (classical clustering and linear discriminant analysis) of statistically significant populations of three early Turonian ammonite species from offshore marls of the Brießnitz Formation (Saxonian Cretaceous Basin, eastern Germany) were used to evaluate a formerly just visually suspected hypothesis of a size dimorphism within the taxa. The studied faunas can in fact be regarded as contemporaneous late early Turonian fossil assemblages derived from a palaeobiogeographic and depositional entity. However, only one of the three species passed the statistical tests. Neither in *Lewesiceras peramplum* nor in *Mammites nodosoides* can a dimorphism be proven. In both taxa, no other features than size can be recognised that differ significantly between the overlapping groups. Furthermore, adulthood cannot be proven due to the absence of unequivocal mature modifications. Thus, a combination of large intraspecific variability and commonly incompletely preserved (i.e., small) specimens dissembles dimorphic populations at a first glance.
On the other hand, the suspected dimorphism in *Spathites* (*Jeanrogericeras*) *reveliereanus* was confirmed by the statistical analyses of numerous biometric parameters. Not only the maximum diameters but also the distinct apertural cross-sections and ornament show significant differences between the statistically clearly separated two groups. Furthermore, a decline in ornament and widening of the body chamber in fully grown macroconch specimens, regarded as a mature modification of the shell, demonstrate that the antidimorphs really differed in adult morphology. Thus, it can be shown that there are in fact two forms in the fossil assemblage of *S. (J.) reveliereanus* that, based on their morphological differences and lack of any overlap, represent micro- and macroconchs (inferred males and females) of an evidently dimorphic ammonite species. Finally, we conclude that simple visual inspection is commonly insufficient for the reliable proof of dimorphism in ammonoids.

Key words: Ammonitina, biometric-statistical analyses, dimorphic pairs, Elbtal Group, Cretaceous.

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