IN SITU FERN SPORES FROM THE TRIASSIC IN EUROPE

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We studied the *in situ* spores of ferns from exceptionally well-preserved palaeofloras of the Triassic in Europe with a focus on intraspecific and interspecific morphological variability. The material mainly comes from the Kühwiesenkopf/Monte Prà della Vacca flora (Dont Formation, Anisian) of Italy, the Lettenkeuper (Erfurt Formation, Ladinian) of Germany, and the Lunz flora (Lunz Formation, Carnian) of Austria. The studied specimens belong to the Marattiales (*Asterotheca merianii*, *Mertensides bullatus*, *Danaeopsis* spp.), Osmundales (*Todites* spp.), possible Osmundales (*Anomopteris mougeotii*, *Gordonopteris lorigae, Scolopendrites* spp.), and Gleicheniales (*Dictyophyllum serratum*, *Clathropteris* cf. *reticulata*). Our analysis is aimed at distinguishing characters that can serve to identify specific taxa from those that fall into the normal range of variability, differentiating developmental stages, and determining the frequency of malformed or abortive grains, which may provide evidence for environmental disturbances affecting plant reproduction. We found considerable variability in spore size and surface ornamentation both between individual plant specimens of a particular species and within single sporangia. Both can be attributed in part to different stages in the sporogenesis, as the spores are not equally mature. Even spores from different parts of a frond show significant differences in their average and maximum sizes, which suggests diachronous maturation. Differences in the size of spores between individuals may also be related to ploidy levels (genome size), which can vary even within populations. Variations in the surface ornamentation are mostly based on the presence or absence of certain sculpture elements. Spore grains with or without these elements correspond to different dispersed taxa. Abortive grains are generally rare but appear with increased frequency in some specimens. The cause may be environmental stress or disease, as well as natural hybridization.