



Mis-shapes, mistakes, misfits: aberration & mutations in terrestrial palynomorphs

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Since 2005 and the recognition of lycopsids permanent tetrads being associated with the end-Permian mass extinction and their potential linkage to an increase in UV-B flux there has been the suggestion that aberrations in the palynomorph record might be used to detect episodes of environmental stress. Our understanding of pollen aberration is chiefly derived from laboratory studies, typically on model plants e.g. *Arabidopsis thaliana* where malformations are induced by exposure of seeds to mutagenic compounds such as ethyl methanesulfonate or exposure to neutron radiation. The end result is the production of abnormal pollen and an understanding of the developmental pathway that is responsible for pollen formation. Further data on non-model plants is available from fieldwork carried out in areas of high pollution. These studies have enabled background levels of aberration to be detected and have been used to demonstrate a link with air pollution from heavy industry and thus a possible link to volcanic eruptions during mass extinction events.

The detection of aberrations in fossil pollen and spore assemblages are essentially a morphological representation of a break down in normal pollen development and are an indication that the parent plant has been exposed to abiotic stress. From a palynological/ palaeoclimate standpoint the challenge is to establish what this record actually means and from there how we can interpret variation in mutation. In this presentation I will outline how these disparate fields can be integrated and outline how this information could be used to aid our understanding of mass extinctions.