Spores, Evo-Devo and the nature of the earliest land plants

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Rapid and remarkable developments in molecular biology have led to the realisation of Evo-Devo research. This is relevant to palynologists because we are beginning to unravel the genetic basis for development of the spore/pollen wall of land plants. The new molecular research, integrated with traditional morphological-ontogenetic analysis based on Transmission Electron Microscopy, is shedding light on the exceedingly complex processes and interactions involved in spore/pollen wall formation. At the same time we seem to be approaching consensus regarding phylogenetic relationships among the major land plant groups: bryophytes (non-vascular plants) and tracheophytes (vascular plants) are now both considered to be monophyletic groups. The analysis of character distribution within the framework of the new phylogeny is revealing a complex picture, with many important characters showing an intricate pattern of loss through the land plant phylogeny. However, these patterns are proving difficult to reconcile with the early land plant fossil record (plant megafossils and dispersed spores). This talk will consider recent developments in our understanding of spore/pollen wall formation, what this means regarding the nature of the spores of basal/early land plants, and how we are attempting to relate this to the early land plant dispersed spore fossil record.