Germination in *Azolla filiculoides* Lam. as seen by SEM and thin-sectioning

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Current taxonomic re-evaluation of *Azolla* by the authors presented the opportunity to employ SEM and thin-sectioning to provide photographic illustration of germination stages. The megaspore apparatus, with attached indusial cap, is released from the floating sporophyte by equatorial splitting of the megasporocarp/megasporangial walls. It immediately sinks, indicating that 'floats' do not endow buoyancy. Released microsporangia also sink to the bottom before liberating massulae. Within the megaspore apparatus, the symbiont *Anabaena azollae* Stras appears to be 'resting' and restricted to the distal space between the megasporocarp and megasporangial wall. The latter is fused to the funnel of suprafilosum folded back over the 'floats'. The female gametophyte develops between the 'floats' within the cylinder of suprafilosum. Its growth pushes the indusial cap upwards, displacing the 'floats'; this displacement probably provides access to the archegonia for the multiflagellate antherozoids. Morphological and histological evidence suggests that *A. azollae* is no longer dormant at this stage. Early embryo development is associated with receipt of the *A. azollae* to perpetuate the symbiotic relationship. Growth of the funnel-shaped 'cotyledonary' leaf ruptures the megasporangial wall, so providing access and a channelled route between *Anabaena* and the embryo shoot apex. Subsequent leaf development severely restricts such access. The *Anabaena* colony becomes established behind the apex around a branched trichome which appears morphologically different from those in leaf cavities. Unlike the 'cotyledonary' leaf, subsequent leaves develop cavities into which apically-derived *Anabaena* becomes incorporated. The developing sporophyte, its apex enclosed by the first leaf, pushes off the indusial cap and rises to the surface in a vertical position still attached to the megaspore apparatus. Buoyancy is probably due to development of leaf cavities and intercellular spaces, the megaspore apparatus sinking immediately on detachment. The elongating sporophyte assumes a horizontal habit; first and second leaves are entire, subsequent leaves are bi-lobed and alternately inserted.

Molecular biological events of imbibing and germinating spores of *Anemia phyllitidis* L. Sw.

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In spores of the fern *Anemia phyllitidis*, induction of germination requires light, or the presence of the *Anemia* antheridiogens or gibberellic acid. The capacity of imbibed spores to germinate is retained for more than 6 weeks even if there are repeated cycles of drying and rehydration. Imbibition and germination have been studied at the translational and transcriptional levels.