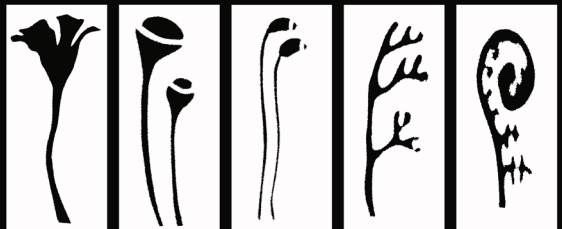




book of abstracts

XXII Symposium of
Cryptogamic Botany



24 to 26 July 2019 | Lisbon, Portugal

What might be the early function of the phytochelatin synthase enzyme?

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The phytochelatin synthase enzyme (PCS) is constitutively expressed in the majority of plants, other eukaryotes and certain cyanobacteria. In the presence of metal(loid)s (i.e., Cd, Pb, Hg, As, etc.) eukaryotic PCSs are activated and produce the so-called “phytochelatins” (PCn), thiol-peptides able to segregate the above metals in the vacuolysosomal compartment. However, the constitutive expression of the PCS enzyme throughout the plant clade, even in the absence of toxic metal(loid)s, would lead us to postulate other possible functions of this enzyme. Iron (Fe) has always been widely c in all environments, but, at the same time, its scarce solubility and bioavailability pose serious problems for the vast majority of organisms. Thus, we hypothesise that PCSs and PCn might not only plays the “classic” role directed to Cd detoxification, but also possesses a function geared towards the homeostatic control of physiological requirements of Fe. To this end, our work deals with molecular and functional characterisation of PCSs in early organisms, such as the charophyte *Nitella mucronata*, the liverworts *Lunularia cruciata* and *Marchantia polymorpha*, the moss *Leptodictium riparium*, the lycophyte *Selaginella denticulata*, as well as some cyanobacterial strains (*Geitlerinema* sp., *Gloeobacter violaceus*, *Nostoc* sp.). The results would allow us to achieve comparative characterisations of ancestral PCSs and further clarify their functions in a number of photoautotrophic organisms.