

About the role of Plant hormones in *Trebouxia*: data and hypothesis

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Tolerance to stress in plants is a coordinated response of multiple stress-related genes, which also cross-talk with other components of stress-signaling transduction pathways. Abscisic acid (ABA) is the critical phytohormone that controls a series of downstream stress responses and integrates signaling from saline, thermal and drought stress conditions. Hormones like salicylic acid (SA) or indolacetic acid (IAA) are also involved in signal transduction and communication among cells in plants.

Lichens are entities resulting from cyclical symbiotic associations between different organisms (fungi, algae and bacteria) intertwined both morphologically and metabolically. In *Ramalina farinacea* two *Trebouxia* taxa (*T. jamesii* and *T. sp.* TR9) coexist. These algae are able to withstand severe abiotic stresses from aerial environment, including osmotic and oxidative stress due to desiccation. In the genome of *Trebouxia sp.* TR9, sequenced and annotated by our group, we have identified genes directly implicated in ABA biosynthesis and ABA-mediated responses, IAA and SA biosynthesis and signaling. We have determined by mass spectrometry the endogenous concentrations of these phytohormones in *Trebouxia* TR9, under control and salt stress conditions. On the other hand, our results do not evidence the presence of another plant hormone, jasmonic acid (JA), mostly involved in plant responses to biotic stress.

We used mass spectrometry to measure ABA, IAA and SA levels under a wide range of salt concentrations. Respect to ABA, although involved in salt response, our results seem to point to a completely different behavior between land plants and *Trebouxia sp.* TR9. About the role of IAA and SA, we suggest that both hormones could be involved in signal transduction from *T. sp.* TR9 to other symbiotic organisms in the complex lichen thalli. (GVA_PROMETEOII/2013/021; MINECO_CGL2012-40058-C02-01; FEDER)