**Desiccation tolerance mechanisms under climate change scenario**

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Water is the most important element for life. During land invasion, the first plants had to face an extreme dry environment, undergoing desiccation, a process in which tissues virtually lose almost all water. Therefore, plants developed desiccation tolerance (DT) mechanisms through which they could experience the dry state and return to normal function upon rehydration, occupying different habitats from deserts to full aquatic environments, with different life forms.

Bryophytes from dry habitats are organized in more dense forms like cushions. Thus, they naturally retain more water by capillarity and dehydrate more slowly than the ones from damp locations when submitted to the same drying conditions. In denser bryophytes, it is expected higher water surface tension and water will be lost at lower rates than the less dense bryophytes. Morphology, life form and colony structure, can be a determinant factor in the adaptation of bryophytes to each habitat and corresponding predicted levels of desiccation. Current climate change, mostly driven by air pollution, is changing water availability and pushing many habitats, specially the Mediterranean, to desertification. The adaptations required for bryophyte survival may have a tremendous impact on their survival and distribution. We tested morphology as a means to control dehydration rate in life forms of bryophytes from contrasting habitats, ranging from semi-arid to aquatic, and discuss its application as a trait to classify bryophyte sensitivity to aridity.