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**OG9. *Pseudocrossidium replicatum* is a highly freezing and osmotic tolerant moss**

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Drought is the abiotic stress that more reduces the plant productivity at worldwide; interestingly some bryophytes species have developed the ability to survive extreme water deficit. Our group is interested in the study of plants showing tolerance to extreme stress conditions. In this work we classified the Mexican moss *Pseudocrossidium replicatum* according to Austin Protocol, and the results shown that this moss has a Fully Desiccation Tolerance type "A" phenotype. This fact was followed by phenotypic and physiologic assays designed to analyze the participation of ABA in *P. replicatum* response to stress. The germination assays shown that *P. replicatum* poses a reduce sensitivity to ABA compared to *Arabidopsis thaliana* seeds. On the other hand, the exogenous application of ABA clearly protects the *P. replicatum* protonema when exposed to osmotic (sorbitol 1.5 and 2.0 M) and freezing (-80 °C) conditions, allowing a faster recovery of PSII activity and growth than the non-ABA treated tissues. The ABA induction of cell protection was evidenced by Evans blue staining. Today, we are constructing a molecular cDNA library in order to identify the *P. replicatum* ABA responsive genes.

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**OG10. Survival and recovery during drying and rehydrating treatment of *Sphagnum* species determined by chlorophyll fluorometry**

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Drought-induced effect on *Sphagnum* fertile/sterile individuals' recovery after rehydration was studied. Chlorophyll-fluorescence parameters of two peat mosses (fertile/sterile individuals of both sexes of *Sphagnum palustre* and *S. angustifolium*) were measured during drying, and following gradual remoistening after a period of desiccation. Photosynthetic function was assessed from $F_v/F_m$, $1-q_p$, ΘPSII, and NPQ. Morphology and the trnH-psbA spacer (barcode) were used for *Sphagnum* species-level identification. Our results are as follows: (1) The activity of photosystem II (PSII), as reflected in a measure of the proportion of closed PSII reaction centers (1-qP) and effective quantum yield (ΦPSII), showed statistical differences between sterile and fertile fully-hydrated individuals (no such differences between fertile females and males were observed). The highest ΦPSII and the lowest 1-qP values were for sterile individuals. (2) A capacity for harmless dissipation of excess excitation energy appeared to be species-specific. (3) Fluorescence parameters (Fv/Fm, 1-qp, and ΦPSII) declined with loss of cell water, whereas non-photochemical quenching NPQ (qE) increased; values of NPQ are higher for *S. angustifolium* in fully-hydrated state and after remoistening. (4) Both species showed similar pattern of response to desiccation but recovery of ΦPSII was slower and less complete in *S. palustre*.