

Theme 2: Photosynthetic diversity

How can the photosynthetic activity of desiccation tolerant plants with different strategies be regenerated after a few years of dehydration?

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Two subdivisions of desiccation tolerant (DT) plants, HDT (homiochlorophyllous) and PDT (poikilochlorophyllous) plants apparently represent contrasting strategies to solve the same ecological problem at drought conditions, whereby HDT plants usually survive shorter drought periods of several days and weeks (up to a few months), whereas PDT plants can endure longer drought periods of 6 to 11 months. Species of HDT strategy well reflects the early regeneration ability after rehydration due to remaining their chlorophyll contents on dehydrating states. PDT plants need more time for activation because they must rebuild their dismantled chloroplasts structure.

Different DT species grown under similar ecological conditions have different and characteristic histo-physiological features. Physiological recovery scale and degree of these plants is useful for understanding plant interactions like colonization benefits under severe growth limitations and also plant-environment relationships which determine their production in their harsh ecosystems.

Significance of recovery and spending time in desiccated period is the basis of a successful surviving strategy because the carbon assimilation during hydrated periods must be higher than carbon costs with carbon losses during desiccated periods. Periods and effects can probably be changing due to global climate change.