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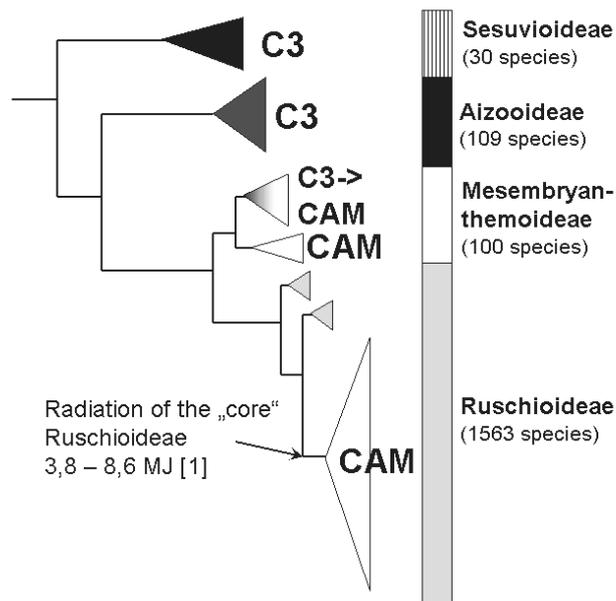
## Ecological adaptations in Southern African Aizoaceae - linking ecophysiology, systematics and evolution

Maik Veste (1) & Joachim Thiede (2)

(1) Brandenburg University of Technology, Research Centre for Landscape Development, Konrad-Wachsmann-Allee 6, D-03046 Cottbus, Germany

(2) University of Hamburg

A large number of succulent species and a high biodiversity are typical for the arid and semi-arid zones of Southern Africa. The iceplant family, Aizoaceae (including Mesembryanthemaceae) developed a huge variation with more than 1750 species with a biodiversity hotspot in the Succulent Karoo. The evolutionary background and origin of the C3 and CAM photosynthesis for the Aizoaceae are projected on the phylogeny of the family based on molecular data [1, 2] (Fig. 1). In the most basal subfamilies Sesuvioideae, Aizoioideae and Tetragonioideae only C3 photosynthesis is known. Within the Mesembryanthemoideae, *Mesembryanthemum* hold a basal position and a shift from C3 to CAM under a strict ontogenetic control is observed. The other perennials in this group (e.g. *Brownanthus*, *Dactyloopsis*) exhibit a typical CAM. There is some evidence that the CAM-cycling may be interpreted as an intermediate step in the evolution of CAM in this family. Species of Mesembryanthemoideae showed a high accumulation of Na and Cl compared to the Ruschioideae [3]. The highest salt accumulation can be found e.g. in *Opophytum aquosum*, *Mesembryanthemum* and *Brownanthus*. Furthermore, in the genus *Brownanthus* ions pattern can be linked to plant systematics.



**Figure 1:** Schematic diagram of the phylogeny of the Aizoaceae [1,2] and the photosynthetic types.

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