

THE ULTRASTRUCTURE OF *PORTULACA* LEAVES

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Foliar chlorenchymatous tissue around the vascular bundles of *Portulaca* species was examined to find any parallelism with the cell ultrastructure of C4 plants. The study was mainly focused on the ultrastructural features of the bundle sheath cells(BSC) and mesophyll cells(MC) which were in direct contact with the BSC. Occurrence and distribution of starch grains, peripheral reticulum, phytoferritin-like structures, chloroplast microtubules and thylakoidal membrane system were studied.

*Portulacas* were divided into two groups by their prominent structural differences. The broad leaved *Portulaca* (group A) showed paradermal veins and a typical Kranz anatomy whereas the cylindrical leaved *Portulaca* (group B) had peripheral veins and a modified Kranz anatomy. In group A, no structural dimorphism of chloroplasts between the BSC and MC occurred, but size dimorphism was detected. Both BSC and MC chloroplasts of this group demonstrated normal grana formation and presence of peripheral reticulum as in other C4 plants, having a more or less well developed grana system and peripheral reticulum in the MC chloroplasts. However, prominent structural dimorphism was found between the BSC and MC chloroplasts of group B. The BSC chloroplasts of group B showed an agranal to rudimentary thylakoidal membrane system along with very well-developed peripheral reticulum. An unique orientation of the thylakoidal membrane system and the well-developed concentric arrangement of the peripheral reticulum in the BSC chloroplasts were quite noticeable in this group. Normal grana formation and peripheral reticulum were observed in the MC chloroplasts in group B. Such structural diversity is also discussed in relation to structure and distribution of mitochondria and microbodies.