



STEM FASCIATION IN CACTI AND SUCCULENT SPECIES TISSUE ANATOMY, PROTEIN PATTERN AND RAPD POLYMORPHISMS

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ABSTRACT

Fasciated and normal stem segments of *Opuntia microdasys*, *Opuntia cylindrica*, *Huernia primulina* and *Euphorbia lactea* were collected from the same plant and compared for their anatomy, water relations and genetic variations. Anatomical differences in terms of thickness of cuticle, vascular bundle, xylem and phloem were analyzed in both normal and fasciated stems. The mucilage cells were higher in the fasciated form of *Opuntia microdasys* than that in the normal form. Water status in terms of total water content (TWC), water deficit and relative water content (RWC) was influenced by fasciation. Genetic variations were tested in normal and fasciated stems using randomly amplified polymorphic DNA (RAPD) fingerprints and SDS-PAGE of soluble protein extracts. SDS-PAGE protein and RAPD analysis confirmed that normal and fasciated tissues were genetically different. Polymerase chain reaction (PCR) yielded different polymorphic banding patterns that were unique to each primer and distinguishable over all samples. The PCR results of normal and fasciated samples were significantly different in cases of primers P1, P2 and P3. These results indicate that occurrence of fasciation in *Opuntia microdasys*, *Opuntia cylindrica*, *Huernia primulina* and *Euphorbia lactea* is an epigenetic mutation of tissues.

