

**Effects of Water Stress on Growth and
Aspects of Primary Metabolism of
Seedlings of Zea Mays Linn. Variety
Farz 27.**

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Abstract:

Maize seedlings raised for six days were subjected to water stress treatments at 76.6% relative water content (RWC) and 66.5% RWC with appropriate controls.

Growth of the maize seedlings, as measured by fresh weights, dry weights, seedling heights, leaf area index, leaf area ratio, leaf weight ratio, net assimilation rate and relative growth rate, was generally retarded by water stress. Water stress, on the other hand, effected enhanced accumulation of chlorophyll a, chlorophyll b, protochlorophyllide, protochlorophyll and phytol in the maize seedlings. The accumulation of carotenes and xanthophylls was enhanced while that of flavonoid was retarded.

The levels of mitochondrial quinones, ATPase activities of the chloroplasts and mitochondria oxidative phosphorylation activity and the activities of succinate, malate and glutamate-dehydrogenases were also generally retarded by water stress.

It is suggested that, in water-stressed maize seedlings, the increased accumulation of carotenoids contributed to the increased accumulation of chlorophylls and their precursors. The retarded accumulation of mitochondrial quinones, and the retarded activities of oxidative phosphorylation and those of such enzymes as ATPases, succinate--, malate- and glutamate-dehydrogenases may be responsible for the retarded growth observed in the stressed maize seedlings. Flavonoid accumulation appears to be a better indicator of the effects of water stress on the performance of maize.

Keywords: Water stress/ water stress treatments

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