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Use of Mycorrhizal Fungi as a Strategy for Improving the Drought Tolerance in Finger Millet [*Eleusine coracana* (L.) Gaertn]

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ABSTRACT: Finger millet (*Eleusine coracana*) is the important millet crop, and mainly grown as dry land crop with harsh environmental conditions in soils having poor water holding capacity. The objective of our present study was to investigate the impact of AMF (*Rhizophagus intraradices*) mediated drought tolerance in finger millet seedlings (shoot and root), through analysis of various parameters such as morpho-physiological, oxidative stress and secondary metabolites. For this pot experiments with finger millet seedlings (mycorrhizal, M and non-mycorrhiza, NM) was done. Both the seedlings were exposed to different drought stress levels (100%, 60% and 40% of FC). Plant growth parameter including shoot length, root length and root, shoot fresh weight were higher in case of mycorrhizal inoculated plants. It was observed that water deficiency significantly reduced the chlorophyll content in non-AM plants but in mycorrhized seedlings it was high. We found that AM inoculated seedlings accumulates high level of osmolytes, while roots accumulates more proline and leaf tissue accumulates more proline. With the alleviation of drought stress leakage of ions increases due to oxidative stress but AM fungi compensated this effect. Significantly higher content of phenol, flavonoid and ascorbic acid, was increased in AM treatments with the progressive drought stress. Total reduced glutathione increased with drought stress and it was 182% higher in AM plant than non-AM under severe stress. In conclusion, our findings indicated that AM fungi increased the drought tolerance of finger millet plant more effectively under severe drought conditions.

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