Differential response of two cultivar groups of Solanum aethiopicum to water deficit stress

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Abstract

Two groups of Solanum aethiopicum were evaluated for drought stress under screenhouse conditions in a factorial experiment laid in a completely randomized design with four replications. The evaluation was done at three stages of growth (seedling, vegetative and flowering). Watering was done until a desired stage was reached respectively. Data was collected on different yield parameters (leaf length, leaf width, number of green leaves) and plant status parameters which included, chlorophyll, stomatal conductance and visual wilting score. Soil moisture content per pot was also routinely monitored. Results from the general analysis of variance exhibited significant differences between groups, stage and well-watered vs stressed. There was a significant decrease (p<0.01) in number of green leaves, leaf length, leaf width, stomatal conductance and soil moisture content with increasing stress. On the other hand, a general increase (p<0.01) was recorded in chlorophyll content and leaf wilting score was observed with increasing stress. At all evaluated developmental stages, water deficit stress negatively affected both Shum and Gilo groups of Solanum aethiopicum. However, the vegetative stage was greatly constrained as compared the other stages. Despite the significant constraint for both groups under water deficit stress at vegetative stage, different drought tolerance mechanisms are exhibited. Furthermore, The Shum group depicted a relatively higher degree of drought tolerance as compared to Gilo thereby providing a more reliable source of drought tolerant genes which could be transferred to other Solanum species.

Keywords: Drought tolerance mechanisms; plant growth stage; plant health status; *Solanum aethiopicum* Gilo; *Solanum aethiopicum* Shum