Phenotyping African eggplant growth and nutritional quality under abiotic stresses

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Abstract

Malnutrition affects approximately one in three people around the world and is particularly prevalent in Africa where more than 40% of all children are being affected by one form of malnutrition. Vegetables have great potential to help reduce this burden due to their current position in the food system and multiple dietetic and nutritive values related to their nutrients content. While climate change is negatively affecting crop production worldwide and increase abiotic stresses prevalence, indigenous vegetables constitute an untapped reservoir of biodiverse and highly nutritional plants adapted to local climates that offer opportunities to improve the nutritional status of local population and resilience of agricultural systems. The African eggplant, Solanum aethiopicum, is one such vegetable, widely consumed within Sub-Saharan Africa but only sparsely researched and promoted, thus not used to its full potential. The objectives of this research were to assess the tolerance of the African eggplant under high temperature and/or drought. As a preliminary step, a description of the African eggplant developmental stages was performed by assessing nutrient dynamics uptake, plant growth, and nutritional quality of fruits during ripening. Then, high temperature and drought were imposed individually and in combination on plants in a controlled environment. Shoot and fruit nutrients and phytonutrients levels, physiological responses, marketable yield, and fruit quality were measured. Results will increase our current understanding of the African eggplant's responses under climate change and potential role in future food systems. They will be the starting point for the study of agronomic management changes to improve tolerance.