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The influence of abiotic stress on physiological and biochemical parameters in two onion species, *Allium cepa* L. and *Allium × cornutum* Clementi ex Visiani

Abstract:

Onions are one of the most important cultivated vegetables in the world. *Allium cepa* is one of the best-known species, with the highest production after the tomato. Because of its special taste and aroma, it has been used as a spice in the human diet for centuries. *Allium × cornutum*, a hybrid onion that grows in rocky areas with little water, has been used in Dalmatian cuisine since ancient times. High temperatures, drought and humidity lead to abiotic stress, which negatively affects morphological and physiological parameters, biochemical processes and the overall plant yield. In the present study, onions were exposed to drought and humidity conditions. The results showed higher chlorophyll and carotenoid content in *A. × cornutum* exposed to drought and in *A. cepa* exposed to humidity. Electrolyte leakage, an indicator of plant stress, was lower in *A. × cornutum* exposed to drought than in control and moist plants, and higher in *A. cepa* exposed to drought, but lower than in the control and moist plants. The total phenolics content, which play an important role in plant defense and stress resistance, was higher in *A. × cornutum* exposed to drought. *A. cepa* control plants and plants exposed to humidity had higher TPC value than those exposed to drought. These results suggest the potential of *A. × cornutum* as a drought resistant plant and of *A. cepa* as a plant more tolerant to humid conditions. Further research is needed to find more resilient plant varieties for the current climate change and food production.

Biography

Zeljana Fredotović has completed her PhD from the Faculty of Science, University of Zagreb, Croatia, in 2017. She is an associate professor at the Faculty of Science, University of Split, Croatia. She has published 30 articles cited in the JCR database and is a guest editor at the International Journal of Molecular Sciences.