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The influence of genotype on the water stress response of Bittersweet

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Plants need water to function properly. In case of drought, several abiotic stresses for plants can be identified, including temperature, light, and nutrient stress. Nevertheless, the component defining drought is limited soil water availability. When water availability becomes limited, most terrestrial plants adapt their metabolism to cope with water stress.
Abiotic stresses and their influence on plants have become a major research priority as a result of the predicted impact of global climate change on rainfall distribution. In developed agriculture, crop losses due to poor water availability already exceed those from all other sources. Drought stress in plants will be aggravated by related problems, such as changes in temperatures, salinization of agricultural lands by irrigation, depletion of groundwater aquifers, and the need to increase agricultural productivity. Studying plant water status unites several abiotic stresses in their detrimental impact on plant metabolism and crop production. A better understanding of the impact of drought on plants is essential for improving management practices and breeding efforts in agriculture, and for predicting the fate of natural vegetation under climate change.
The aim of our study was to investigate the influence of genotype on the response of plants under water stressed conditions. Drought responses were studied in Solanum dulcamara (Bittersweet). Thriving populations of Bittersweet plants can been found in environments ranging from dry coastal dunes to continuously wet lake borders. Bittersweet plants originating from two populations were greenhouse grown for four weeks after which water stress was imposed. Three plants originated from a wet population in the Rhine floodplain (Bromberenwart-Ooijpolder, NL), and three plants originated from a dry population at the Pietersberg Maastricht, NL. The results indicate an interaction between plant origin (dry or wet population) and its ability to retain water in its organs and the soil.