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Differences in the Vegetative Growth between Common and Tartary Buckwheat in Saline Hydroponic Culture

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Abstract: Common buckwheat (*Fagopyrum esculentum* Moench cv. Tsushima) and Tartary buckwheat (*F. tataricum* (L.) Gaertn. cv. Pontivy) were grown in a nutrient solution with or without added NaCl to investigate interspecific differences in their responses to salinity, based on their dry-matter production. The mechanism of salt tolerance was also studied. Addition of 100 mM NaCl to the culture solution (salt treatment) lowered the plant growth rate to 48% and 16% of the control in Tsushima and Pontivy, respectively, and decreased the net assimilation rate and mean leaf area of Pontivy more severely than in Tsushima. The salt treatment decreased the leaf growth rate and leaf area per leaf to 30% and 72% of the control, respectively, in Tsushima, and to 12% and 52%, respectively, in Pontivy. It decreased the photosynthetic rate to 67% and 35% of the control, and stomatal conductance to 25% and 15% of the control in Tsushima and Pontivy, respectively. It also decreased the transpiration rate to 41% and 30% of the control in Tsushima and Pontivy, respectively, and increased the wateruse efficiency 1.6 times in Tsushima, but did not influence the wateruse efficiency in Pontivy. In the saline solution, the accumulation of Na⁺ in leaves and stem was greater in Pontivy than in Tsushima, but that in the roots, was greater in Tsushima than in Pontivy. In both species, Na⁺ accumulated rapidly in the leaves after removal of the roots in the saline solution. We conclude that the difference in salt tolerance between common and Tartary buckwheat may result from the difference in accumulation of Na⁺ in leaves and absorption of Na⁺ by the roots.

Keywords: [Buckwheat](#), [Interspecific difference](#), [Salt tolerance](#), [Sodium](#), [Vegetative growth](#)

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