



Effects of water stress and rewatering on growth and photosynthetic parameters of *Typha orientalis* Presl in coexistence conditions

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Received 24 February 2018; Accepted 24 June 2018

ABSTRACT

Water stress and interspecific interaction will change the growth characteristics and photosynthetic parameters of wetland plants. The net photosynthetic rate (Pn), stomatal conductance (Gs), transpiration rate (Tr), water use efficiency (WUE), plant height (PH), biomass of *Typha orientalis* Presl were analyzed by pot experiments. Pot experiments were conducted utilizing the plant species, *Typha orientalis* Presl alone, and *Typha orientalis* Presl along with *Phragmites australis* coexisting under the same water stress and water abundant conditions. Water stress was divided into four scenarios as W1i, W2i, W3i and W4i that ranged from mild to severe stress. In addition, the control experiment (CKi) was also conducted. The results showed that Pn, Gs, Tr, WUE, PH and biomass were reduced with the increase in severity of water stress. There were large differences in WUE among water stress treatments at the end of the experiment. The trend showed that W2i > W3i > W1i > CKi, while there was a decrease under W4i's scenario. Therefore, the data suggested that a moderate increase in water stress could increase WUE. The growth and photosynthetic parameters of *Typha orientalis* Presl recovered after rewating, but not under CKi's scenario. The threshold soil moisture for *Typha orientalis* Presl was approximately 30% below, which demonstrated that recovery could be difficult even after rewating. Coexistence with *Phragmites australis* had significant effects on the growth of *Typha orientalis* Presl and photosynthetic parameters. It was negative for biomass of *Typha orientalis* Presl, and positive for shoot heights in the same water stress treatments. The photosynthetic parameters were higher than single species in coexistence conditions.

Keywords: Water stress; Rewatering; Coexistence; *Typha orientalis* Presl; Growth characteristics; Photosynthetic parameters

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Presented at the 3rd International Conference on Recent Advancements in Chemical, Environmental and Energy Engineering, 15–16 February, Chennai, India, 2018.