



Exotic species is more resilient than native species to extreme natural drought in a semiarid revegetated ecosystem

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The increasing frequency and strength of droughts can exert great impacts on the trajectory of revegetation by reducing water availability and altering ecophysiological response of plants in semiarid ecosystems. Understanding the functioning and functional plasticity of root systems and the response of water source use of different revegetated species to extreme droughts is therefore of critical importance to predict the persistence of revegetation under future climates in these ecosystems. We conducted a two-year-long experiment to investigate the seasonality of water source use for one exotic shrub species *Caragana korshinskii* and one native small-shrub species *Artemisia gmelinii* at two different growing stages based on stable isotopes, in situ soil moisture observations and fine roots distribution. And the prolonged drought especially the record extreme natural drought in July of 2015 is allowed to probe its impact on water use strategy of revegetated species. The results showed both exotic and native species showed significant seasonal patterns with the changes of soil water availability. And the prolonged and extreme natural drought caused the native species mature *A. gmelinii* highly dependent of shallow soil water and resulted in clear stem mortality but not for the exotic species *C. korshinskii*. This means the native species *A. gmelinii* is less resilient to extreme natural drought than exotic species *C. korshinskii* and hence could be more disturbed by future extreme climates. The results here provide an insight into the dynamics of revegetated species in semiarid ecosystems.