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Nitrogen recovery of temperate desert ecosystem enhanced with precipitation and nitrogen deposition increase

Xiaoqing Cui[1], **Ping Yue**[2] and **Xuejun Liu**[1]
[1]China Agricultural University, China
[2]Chinese Academy of Sciences, China

Arid regions have been undergoing global climate change and widespread reactive nitrogen (N) deposition. And N retention as a critical ecosystem function, our understanding about its response to climate and N deposition change is limited especially in the desert ecosystem. Here, we use double-labeled $^{15}NH_4{}^{15}NO_3$ fertilizer (30 and 60 kg N ha^{-1} yr^{-1}) to tracer N fate and N residual under ambient (no water addition) and enhanced precipitation (60 mm water addition) condition in a temperate desert ecosystem in Northwest China. The N retention of plants showed a significantly different response to water and nitrogen addition between years. Soil as the largest pool of N retention, N addition significantly enhanced the N retention of topsoil layer. The whole ecosystem recovery significantly differed between years, in the dry year it was less than 10% and in the wet year, it reached 75% averagely. What's important, the residual N can be up taken by plants when precipitation was enough next year. The two-year accumulated ecosystem recovery could be raised up to 58%. The whole ecosystem recovery significantly enhanced with water addition and had no significant relationship with water addition. So, in future climate and nitrogen deposition change scenario, the plant-soil ecosystem recovery will significantly increase in the temperate desert.

Biography

Xiaoqing Cui has majors in Plant Nutrition and Ecology. She has good expertise in evaluating the ecological impact of climate and nitrogen deposition on desert ecosystem. She has quantified nitrogen fate in a *Haloxylon ammodendron* dominated desert ecosystem. This is of significant importance in evaluating the nitrogen fluxes in arid desert ecosystem under future climate and anthropogenic activity, which is useful for updating nitrogen cycle model in arid regions.

cuixq111@163.com

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