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# Sensitivity of the xerophytic moss Syntrichia caninervis to chronic simulated nitrogen deposition

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Biological soil crusts, complex of cyanobacteira, fungi, lichens and mosses, are common in dryland area and act as important elements of these ecosystems. Syntrichia caninervis is the dominant species in moss crusts in many desert ecosystems. Increasing N deposition has lead to great changes in community structure and function in the desert ecosystem worldwide. However, it is unclear how moss crusts respond to increased atmospheric N deposition, especially in term of growth and physiological parameters. The population and individual growth, and physiological responses of S. caninervis to six different doses of simulated N deposition (0, 0.3, 0.5, 1.0, 1.5 and 3.0 g N m-2 a-1) over three years were studied.

Simulated N deposition in the Gurbantunggut Desert affected growth and physiological indices of the xerophytic moss S.caninervis. Low N addition increased individual plant length and leaf size. High N addition was detrimental to almost all growth characteristics monitored, although moss abundance was increased. The photosynthesis-related indices were moderately increased at low N addition rates and significantly decreased by high N addition. Changes in osmotic adjustment substance concentrations and activities of antioxidant enzymes facilitated protection of leaf cells from oxidative damage under N addition. Low rates of N additiondid not significantly affect, and may even stimulate growth and physiological activity of moss crusts. However, high rates of N addition decreased moss vitality and might affect the function of moss crusts. Moss crusts are sensitive to N addition and greater attention should be paid to protection of such kinds of biological complexes in desert ecosystems under increasing N deposition.

Key words: antioxidant enzyme, chlorophyll, fluorescence, nitrogen deposition, osmotic substance, Syntrichia caninervis