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Lanjing Kong
Shandong Agricultural Univeristy, China

Zhiguo Zhang
Shanghai Institute of Technology, China

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Physiological response to soil drought stress for two ornamental grasses

Lanjing Kong¹, Zhiguo Zhang²

¹ College of Life Science, Shandong Agriculture University, Taian, 271018, China; E-mail: konglanjing@yahoo.com.cn,

² College of Ecology, Shanghai Institute of Technology, Shanghai, 200235, China

Key words: ornamental grass, drought stress, physiological response, *Cortaderia selloana*, *Eragrostis curvula*

Introduction *Cortaderia selloana* and *Eragrostis curvula* are gramineous ornamental grasses with prodigious potential and ability to spread. With the decrease of water resources, it is important to seek drought-resistance ornamental grasses. The objective of this study was to evaluate the drought-tolerance of these two ornamental grasses.

Materials and methods The experiment was conducted in three soil water gradients as 75%~80% (well water, CK), 40%~45% (moderate water stress, T₁), and 30%~35% (severe water stress, T₂) of field water holding capacity. Drought stress was imposed when the grasses were 3-months old by withholding water. The soil water content of each pot was monitored by weighing the pot which was covered with *Rain Out Shelters* to eliminate the effects of rainfall. Physiological indexes were measured on leaves after 14-day treatment (Zhao Shijie, 1998).

Results With the increasing drought stress, the relative water content and water potential of two ornamental grasses decreased gradually (Table 1). The relative water content of *Eragrostis curvula* declined rapidly with severe water stress. The change of leaf water potential also showed that the water retention capacity of *Eragrostis curvula* is lower than for *Cortaderia selloana*. *Cortaderia selloana*, also suffered less plasma membrane damage at all stress levels.

Table 1 Effects of soil drought stress on water potential, relative water content and relative permeability of plasma membrane of ornamental grass leaves.

Species	Leaf relative water content (%)			Leaf water potential (-MPa)			Relative electric conductivity (%)			T1 Damaging degree(%)	T2 Damaging degree (%)
	CK	T1	T2	CK	T1	T2	CK	T1	T2		
<i>Cortaderia selloana</i>	98.1 aA	91.5 aA	88.7 aA	0.74 aA	1.72 aA	1.86 aA	18.5 bA	19.4 abA	20.9 aA	1.06bB	2.93bB
<i>Eragrostis curvula</i>	93.6 bA	86.6 bB	74.6 bB	1.04 bA	2.52 bA	3.47 bB	19.2 bB	26.1 bB	35.9 aA	8.52aA	20.6aA

Note: The same letter indicates no significance, the big and small letter indicates significance at 0.01 and 0.05 level separately in the same column.

Conclusion The results indicated that *Cortaderia selloana* is more drought-tolerant than *Eragrostis curvula*.

Reference

Zhao Shijie. The Guide of Plant Physiological Experiment. [M] Beijing: China Agricultural Science and Technology Press, 1998, 10.