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The primary study on morphological variations of *Elytrigia repens* germplasm resources

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Introduction Quackgrass (*Elytrigia repens* (L) Nevski) has tender leaves and stems, high nutritive value, plenty of rhizomes, and is suitable to be utilized as turf and forage (Meng Lin, 2003). In the 1950s, the well-known professor Liu Shene put forward that quackgrass should be explored as turf. Researchers at Northeast Agricultural College believe in the potential in establishing turf (Xiao Wenyi, 1989), but so far the study on wild quackgrass resources collection and appraisal has not been carried out, Xinjiang is a main distributing area of quackgrass, hence we believe that the primary study on quackgrass resources here is essential.

Materials and methods Research was conducted on desert sierozem (middle-loamy) belonging to Experiment field of Xinjiang Agricultural University in Urumqi (located in 43°47'N, 87°37'E, 850 m above sea level, the capital of Xinjiang). Morphological variance of 28 accessions (Er1-Er23 collected from various regions of Xinjiang, Er24-Er28 introduced from Beijing) was evaluated, vegetation was planted in the spring of 2007. Plots consisted of one or two rows, spaced 50cm apart. When the plants at each plot were in full-bloom stage, eight morphological indexes were analyzed, for every index, thirty data per accessions were collected. Height of reproductive branch (Hrb) was measured from the base. Height of turf (Ht) was measured to the top of the leaf layer. Stem diameter (Ds) was measured on the second above-ground internode. Length and maximum width of the leaf blades (Lw, L1) were measured on the leaf next to flag leaf. Inflorescence length (IFl) was measured from apex to bottom of inflorescence. Spike number per inflorescence (Snpi) and Spikelet number per spike (Snpp) were counted. The variance, correlation analysis among eight indexes and every index with longitude, latitude, and altitude were carried out. The data were analyzed with SPSS11.0.

Results and analysis Analysis on the variance of morphological characteristics and the correlation among the indexes is shown in Table 1. Among the eight indexes, the variance of Ht is the most significant, coefficient of variance reached 68.86%, Lw is the least, only 20.89%, as showed the elite strain with low height could be selected out by systemic breeding, but Lw is difficult to be improved. Among vegetative organ indexes, high correlation exists, with height of turf becoming high, height of reproductive branch, Stem diameter, width of the leaf blades obviously increase. Among reproductive organ indexes, Snpi and IFl show high correlation. Between the vegetative organ indexes and reproductive organ indexes, high correlation also exist, the more plant is high, the more IFl is long and Snpi is more (Table 2). The correlation between longitude, latitude, altitude and every characteristic was analyzed, the results show altitude and L1 existed high negative correlativity, and the correlative coefficient was -0.586.

By cluster analysis (result is shown in figure 1), when Euclidean distance reaches 7.5, 28 accessions can be divided into three types. The first type included E21, E24, E26, and have tall plants, long and wide leaves, long inflorescence and many spikelets. The second type included E14, E17, E19, E20, E25; they are lower than the first type; the characteristics of the last type are plant is the lowest, the leaves are the slimmest, snpi is more than the other types.

References

- Menglin lin, Zhang Guofang. Excellent plant for forage, turf, water and soil conservation. *Elytrigia repens* L. [J]. *Grassland and turf*, 2003, (4): 16-18.
- Xiao Wenyi. North type turf plant- *Elytrigia repens* L. [J]. *Grassland of china*, 1989, (4): 78-80.

Table 1 Variations of morphological characteristics of 28 germplasm resources

Item	Ht (cm)	Hrb (cm)	Ds (cm)	IFl (cm)	Snpi	Snpp	L1 (cm)	Lw (cm)
mean	20.25	65.97	0.151	14.22	17.81	5.54	16.55	7.64
S	13.94	23.53	0.036	3.71	5.50	2.12	5.11	1.60
min	8.10	34.50	0.098	8.04	10.20	3.00	7.90	5.49
max	38.51	124.02	0.246	23.82	31.53	10.00	26.16	11.75
CV(%)	68.86	35.67	23.75	26.10	30.90	38.24	30.89	20.89

Table 2 The correlation among the morphological characteristic

Item	Ht	Hrb	Ds	IFl	Snpi	Snpp	L1	Lw
Ht	1							
Hrb	0.756**	1						
Ds	0.624**	0.728**	1					
IFl	0.313	0.503**	0.546**	1				
Snpi	0.730**	0.566**	0.583**	0.410*	1			
Snpp	-0.364	-0.318	-0.347	0.103	-0.343	1		
L1	0.034	-0.077	0.018	0.492**	-0.038	0.522**	1	
Lw	0.408*	0.368	0.569**	0.574**	0.465*	-0.233	0.261	1

