

## Adaptation benefit two grass coexisting in meadow steppe of northeast China

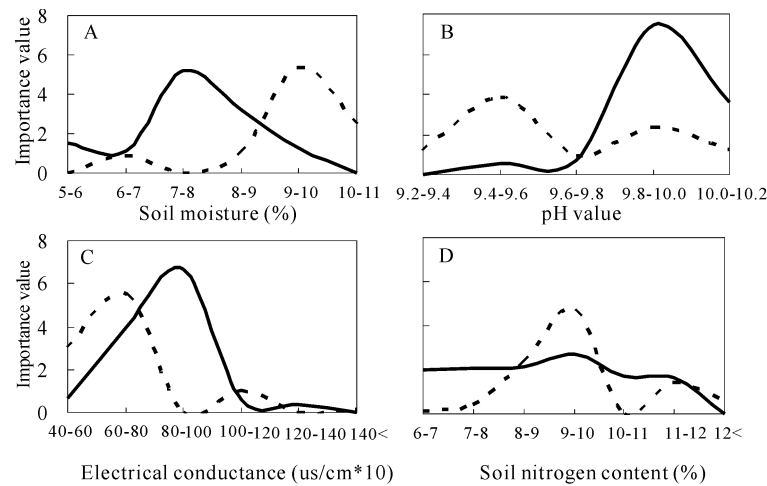
Ba Lei , Xu Wei , Wang Deli

Key Laboratory of Vegetation Ecology , Ministry of Education , Institute of Grassland Science , Northeast Normal University , Changchun , 130024 , P . R . China . E-mail : bal337@nenu .edu .cn

**Key words :** adaptation , coexisting , meadow steppe , soil property

**Introduction** *Leymus chinensis* and *Phragmites communis* are dominant and sub-dominant species in meadow steppe of Northeast China . They often co-dominate in natural meadow steppe . Important values of both species were used to examine the adaptation of *L . chinensis* and *P . communis* to soil properties and explain their co-existing .

**Materials and methods** Vegetation characteristics and soil properties were investigated and determined for six pure stands of *L . chinensis* and *P . communis* respectively , and five mixed stands for both species during two growing season . Important value was calculated from height , coverage , biomass and density . Soil properties involving soil moisture , pH value , electrical conductance and nitrogen content were determined .



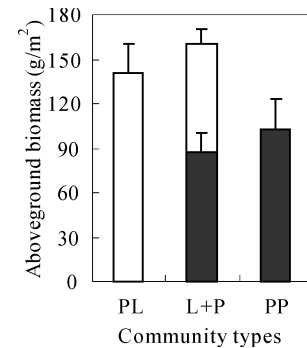
**Figure 2** Different responses of *Leymus chinensis* (—) and *Phragmites communis* (---) to the change of soil properties .

**Results** Plants in the mixed stands of *L . chinensis* and *P . communis* showed a tendency of having higher aboveground biomass than those in pure stand of *L . chinensis* and *P . communis* (Figure 1 ;  $P=0 .088$ ) . The important value differed largely in soil moisture , pH value , electrical conductance and nitrogen content for both species (Figure 2A-D) . *L . chinensis* preferred growing in habitats with lower soil moisture , and higher concentration of salt and alkali in soil , but higher soil moisture and nitrogen concentration , low salt concentration favored by *P . communis* (Ba et al . , 2006) .

**Conclusion** *L . chinensis* showed a tolerance to drought , and salt and alkali stress . While *P . communis* adapted to environment with rich soil water and nutrient . Differentiation in niches of soil properties provided the possibility for both species coexisting in the natural meadow steppe of Northeast China (Silvertown , 2004) .

### Reference

- Silvertown , J . , (2004) . Plant height and the niche . *Trends in Ecology & Evolution* 18(11) : 605-611 .  
 Ba , L . , Wang , D . L . , Hodgkinson , K . C . , et al . (2006) . Competitive relationships between two contrasting but coexisting grasses , *Leymus chinensis* and *Phragmites communis* . *Plant Ecology* 183(1) : 19-26 .



**Figure 1** Production of mixed communities (L + P) is often greater than those of pure *Leymus chinensis* stands (PL) and *Phragmites communis* stands (PP) .