



University of Kentucky  
UKnowledge

---

International Grassland Congress Proceedings

XXI International Grassland Congress / VIII  
International Rangeland Congress

---

## Changes of Vegetation in the Sandy Desertification Process of Grassland in Yanchi, Ningxia

D. M. Xu  
*Ningxia University, China*

K. Wang  
*China Agricultural University, China*

Y. Z. Xie  
*Ningxia University, China*

Follow this and additional works at: <https://uknowledge.uky.edu/igc>



Part of the [Plant Sciences Commons](#), and the [Soil Science Commons](#)

This document is available at <https://uknowledge.uky.edu/igc/21/6-2/20>

The XXI International Grassland Congress / VIII International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

---

This Event is brought to you for free and open access by the Plant and Soil Sciences at UKnowledge. It has been accepted for inclusion in International Grassland Congress Proceedings by an authorized administrator of UKnowledge. For more information, please contact [UKnowledge@lsv.uky.edu](mailto:UKnowledge@lsv.uky.edu).

## Changes of vegetation in the sandy desertification process of grassland in Yanchi , Ningxia

D.M. Xu<sup>1</sup>, K. Wang<sup>2</sup>, Y.Z. Xie<sup>1</sup>

<sup>1</sup> Ningxia University, Yinchuan, Ningxia 750021, PR China, <sup>2</sup> Department of Grassland Science, College of Animal Science and Technology, China Agricultural University, Beijing 100094, PR China

**Key words :** vegetation, sandy desertification, perennials, therophytes, psammophyte shrubs

**Introduction** Yanchi county, locates at the southwest fringe of Mu Us sandy land, and is an ecotone comprising sandy land through to desert steppe and to steppe. Over the recent decades, Yanchi has suffered severe sandy desertification. The distinct vegetation conditions between sandy grasslands at different desertification levels have resulted from a considerable difference in intensity of wind erosion. The objective of this study is to explore the changes of vegetation characteristics among different desertification degrees.

**Materials and methods** For quantitative field sampling, three 110km-long parallel transects running from inner steppe to mobile-sand dunes were established according to vegetation distributing image of Yanchi county. The sampling plots were arranged at 2km intervals along each transect. In each plots, plant density, frequency, coverage and height for each species were recorded and the importance value for each species were calculated through relative density, relative coverage, relative height and relative frequency using the method described by Ren (1998) from July to August at the peak of crop standing.

**Results** A total of 64 plant species were recorded. At the potential desertification land (PD), the dominant plants were *Stipa bungeana* and *Lespedeza potaninii*. At the light desertification land (LD), *Lespedeza potaninii* was most frequently found. At the medium desertification land (MD), *Leymus secalinus* and *Echinopsilon divaricatum* were frequently found. At the severe desertification lands (SD), the dominant plant was *Salsola pestifer*. At extreme desertification land (ED), floristic composition is dominated by psammophyte shrubs such as *Salix psammophylla*, *Artemisia sphaeracephala*.

**Table 1** Patterns and dynamics of plant life form composition for different desertification categories.

Desertification categories	Total species number	Perennials		Therophytes		Shrubs or semi-scrubs	
		Species number	Dominance (%)	Species number	Dominance (%)	Species number	Dominance (%)
PD	23	17	87.33	6	12.67	0	0
LD	49	34	67.71	15	32.29	0	0
MD	28	19	62.69	9	37.31	0	0
SD	28	13	43.63	14	55.94	1	0.43
ED	17	3	19.97	8	22.94	6	57.09

**Conclusions** With sandy desertification aggravating, the steppe species lost their former competitive advantages and gradually gave place to arid and sand tolerant perennial species and therophytes and eventually to psammophyte annuals and shrubs. Therefore, the steppe dominant species became subdominant component in light and medium desertification lands and dropped out or even faded out in severe and extreme desertification lands.

### Reference

Ren, J.Z., 1998. Investigative methods of pratacultural science. China Agricultural Press: Beijing, China, 11-16.