



University of Kentucky
UKnowledge

International Grassland Congress Proceedings

21st International Grassland Congress / 8th
International Rangeland Congress

Fencing Effects on Biodiversity Changes in Desertified Grassland in Hulunbeir, China

Shihai Lu

Chinese Academy of Environmental Sciences, China

Jixi Gao

Chinese Academy of Environmental Sciences, China

Changsong Feng

Beijing Forestry University, China

Xinshi Lu

Beijing Forestry 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/21/3-1/24>

The 21st International Grassland Congress / 8th 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.

Fencing effects on biodiversity changes in desertified grassland in Hulunbeir ,China

Lu Shi-Hai¹ ,Gao Ji-xi¹ ,Feng Chang-Song² , Lu Xin-Shi²

¹Ecological Environment Institute of Chinese Academy of Environmental Sciences , Beijing 100012 , R . P . China . E-mail : lvshihai@sohu . com , ² Natural Resource and Environment College , Beijing Forestry University , Beijing 100083

Key words : desertified grassland , fencing effect , biodiversity , Hulunbeir grassland

Introduction Hulunbeir grassland is the best grassland in China ,but since the last 20 years , the grassland desertified in a large area . Fencing as a major grassland rehabilitation and reconstruction measures have been widely adopted in the world .

Materials and methods Located in Wangong Town , which belongs to Chenbaerhu Banner , Hulunbeir City of Inner Mongolia , the experiment sites were selected . Samples were collected in desertified grasslands of fenced 1 year , 4 years , 7 years , 11 years and 17 years , respectively . Plant community and biodiversity were measured .

Results The coverage of vegetation , the height of herbaceous layer , and the density and biomass (including aboveground biomass and belowground biomass in the depth of 30cm) , showed a significant linear regression (Table 1) . Species richness and species diversity is improved drastically , the species richness index is fit with the dualistic function ($r=0.9919$, $p<0.01$) (Figure 1) .

Table 1 Regression relationships between community structure and fencing time .

Items	Regression models	R ²	R	P
Coverage (Y _C)	$Y_C = 0.0015X^3 - 0.1034X^2 + 2.9622X + 4.3182$	0.7697	0.8773	<0.01
Height (Y _H)	$Y_H = 8.1871 \ln(X) + 15.621$	0.9626	0.9811	<0.01
Density (Y _D)	$Y_D = 18.534 e^{0.837X}$	0.9392	0.9691	<0.01
Biomass (Y _B)	$Y_B = 29.217X^3 - 284.37X^2 + 830.21X - 539.41$	0.9751	0.9875	<0.01
Root weight (Y _R)	$Y_R = 13.925X^3 - 163.05X^2 + 617.93X - 431.64$	0.9904	0.951	<0.01

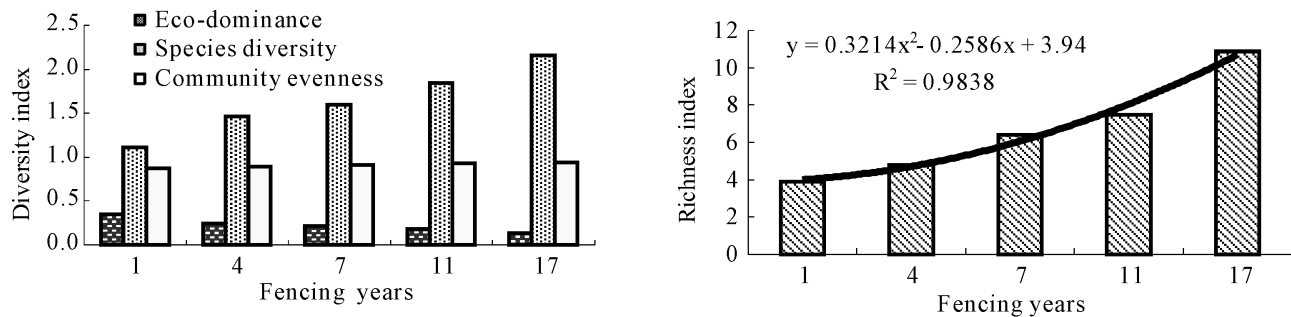


Figure 1 Changes of richness , dominance , biodiversity and evenness of community species in different years after enclosing .

Conclusions Fencing changed the desertified grassland community composition .The species richness increased continually , the structure of community improved . Species biodiversity and community evenness has been escalated .

References

- Middleton N J , Thomas D S G . (1998) .World Atlas of Desertification . 2nd edition . London : Edward Arnold , 5-12 .
 Meissner R A , Facelli J M . (1999) . Effects of sheep exclusion on the soil seed bank and annual vegetation in chenopods shrubland of south Australia . *Journal of Arid Environments* , 42 :117-128 .