



University of Kentucky  
UKnowledge

---

International Grassland Congress Proceedings

21st International Grassland Congress / 8th  
International Rangeland Congress

---

## Influence of Different Sampling Strategies on the Relationship of Biodiversity and Grassland Primary Production

Liang Zhao

*Chinese Academy of Sciences, China*

Huimin Yang

*Lanzhou University, China*

Zhongling Liu

*Chinese Academy of Sciences, China*

Honglang Xiao

*Inner Mongolia 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/21/1-6/10>

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](mailto:UKnowledge@lsv.uky.edu).

## Influence of different sampling strategies on the relationship of biodiversity and grassland primary production

Liang Zhao<sup>1</sup>, Huimin Yang<sup>2</sup>, Zhongling Liu<sup>3</sup>, Honglang Xiao<sup>1\*</sup>

<sup>1</sup> Cold and Arid Regions Environmental and Engineering Research Institute, CAS, Lanzhou 730000, China;

<sup>2</sup> College of Pastoral Agriculture Science and Technology, Lanzhou University, Lanzhou 730020, China;

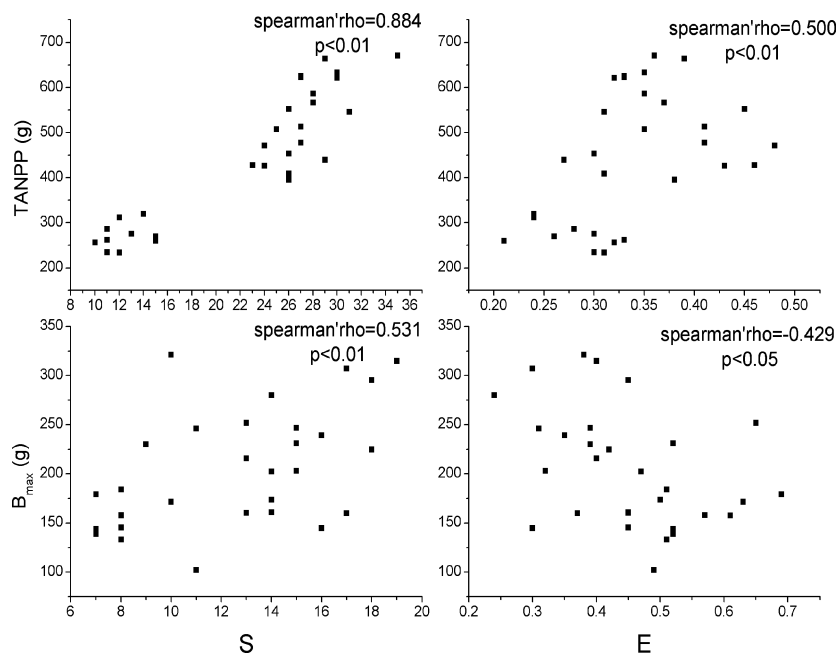
<sup>3</sup> Inner Mongolia University, Huhhot 010021, China;

\* Corresponding author. E-mail: zhao1@lzu.edu.cn

**Key words:** sampling strategy, species richness, species evenness, production, phenological separation

**Introduction** The relationship between biodiversity and ecosystems function (primary production shown in most studies) is a key issue for ecologists. The maximum community biomass in August was used as production in almost all studies. Some researchers suggested that a multi-harvest sampling strategy may be better in grassland communities (Hooper and Dukes, 2004). A three-year study was conducted in a natural grassland community to test the influence of the sampling strategy on the relationship between biodiversity and grassland primary production.

**Materials and methods** Three plots were selected, and fenced in different years. From May to September, all live grass was clipped every two weeks for three years. The maximum biomasses for each species during the growing season were summed as the total annual primary production (TANPP), while the maximum biomass of the community in late August was indicated  $B_{max}$ . Both species richness (S) and independent species evenness (E) were used as diversity indices.



**Results and discussion** Species richness had a positive relationship with both TANPP and  $B_{max}$  in all three years. Species evenness had a positive relationship with TANPP in all three years while it had a negative relationship or non correlation with  $B_{max}$ . These results showed that complementary effect and sampling effect were confused with different sampling strategies (Mulder et al., 2004). This may suggest that phenological separation is an important factor for interpreting the relationship between diversity and production in seasonal grassland communities.

**Acknowledgement** This work was supported by Chinese Academy of Sciences Action-Plan for West Development (KZCX2-XB2-04).

### References

- Hooper, D.U., Dukes, J.S., (2004). Overyielding among plant functional groups in a long-term experiment. *Ecology Letters* 7, 95-105.
- Mulder, C.P.H., Bazeley-Whiter, P.G., Dimitrakopoulos, A., Hector, M., Scherer-Lorenzen, Schindl, B., (2004). *Species evenness and production in experimental plant communities*. *Oikos* 107, 50-63.