The role of grazing exclusion by fence in regulating vegetation characteristics and plant diversity in Mongolian rangelands

Tong Guo
Department of Ecology, College of Urban and Environmental Sciences, Peking University, China

Introduction

Grazing largely affects vegetation dynamic of grassland communities. An intensified grazing will likely lead to grassland degradation. Therefore, to restore degraded grasslands, grazing exclusion by fence might be very helpful. However, the direction and the strength of fencing effects on vegetation characteristics and plant diversity are currently disputable. In addition, vegetation cover and species richness were often independently examined in rangelands, their relationship is not well detected.

I performed a fencing experiment in three grassland types of Mongolia. Each of three grasslands was set by two treatments: grazing exclusion by fence and freely grazing. Vegetation characteristics were mirrored by vegetation cover and height. Plant diversity was measured by the index of species richness.

This study fills the knowledge gap of grazing management effects in Mongolian rangelands, and will project the impact of changes in land use on ecosystem functioning.

Methodology

- **Location**
- **Grassland types**
- **Experimental design**

<table>
<thead>
<tr>
<th>Location</th>
<th>Dry steppe</th>
<th>Mountain steppe</th>
<th>Meadow</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAP (mm)</td>
<td>258.4</td>
<td>287.5</td>
<td>287.5</td>
</tr>
<tr>
<td>MAT (℃)</td>
<td>-2.6</td>
<td>-1.8</td>
<td>-2.6</td>
</tr>
<tr>
<td>Grazing intensity (LSU)</td>
<td>11</td>
<td>7</td>
<td>7</td>
</tr>
</tbody>
</table>

LSU: large stock unit per 100 ha, one large stock unit can be deemed as one cow

- **Experimental period** 2013 - 2018 every year
- **Indices measured** vegetation height and cover, species richness

Results

- **Vegetation Characteristics**
- **Plant Diversity**

- **Richness-Cover Relationship**

- **Conclusions**
  1. Grazing exclusion by fence is not efficient in restoring vegetation cover and species richness in Mongolian rangelands
  2. Species richness generally increases vegetation cover independent of treatments and grassland types.

Contact

Dr. Guo Tong (tongg@pku.edu.cn)
College of Urban and Environmental Sciences
Peking University, China