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## Diversity of desert rodent communities under different disturbances and scales in Alashan Desert , Inner Mongolia

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**Key words :** rodent ,community ,disturbance ,scale ,diversity ,desert

**Introduction** The diversity characteristics and biomass dynamics of rodent communities were studied under the scales of 10 hm<sup>2</sup> and 40 hm<sup>2</sup> from 2002 to 2005 . It is known that the same disturbance elements can lead to different impacts , depending on the properties , characteristics and activities of the disturbance . In this study , four types of disturbances were evaluated : farmland , rotational grazing , over grazing and forbidden grazing . The study was in the Alashan Desert of Inner Mongolia .

**Materials and methods** The studied area is N 37°24' ~ 38°25' , E 104°10' ~ 105°30' , The vegetation was scarce and scattered , with a uniform coverage as low as to 1% ~ 20% . The plant species were all drought and salt resistant species , mostly shrub , half-shrub , small shrub , and half small shrub . The annual precipitation ranges from 45 mm to 215 mm , chiefly concentrated in July-August , whereas the annual evaporation ranges from 3000 mm to 4700 mm . Rodents were captured in the sites by trap-day where the traps were set up 5m away from each other in 50 m transects , which remained throughout the day and night . There were two sites , 10hm<sup>2</sup> and 40 hm<sup>2</sup> , in each disturbance habitat .

**Results** The results (Table 1) show that the diversity indices of farmland and over grazing disturbances are higher than that of rotational grazing and forbidden grazing disturbances ; also the rotational grazing disturbance is the lowest under two scales . The evenness index of farmland disturbance is the highest under the scale of 10hm<sup>2</sup> , that of forbidden grazing disturbance is the highest under the scale of 40hm<sup>2</sup> , and that of rotational grazing disturbance is the lowest under two scales . The dominant indices of rotational grazing disturbance are the highest under two scales . The richness indices of over grazing disturbance are the highest , and that of forbidden grazing disturbance are the lowest under the two scales (Table 1) .

**Table 1** Diversity characteristics of desert rodent communities in different habitats and scales .

Disturbance	Species		Diversity index		Evenness index		Dominance index		Richness index	
	A	B	A	B	A	B	A	B	A	B
I	8	8	1.562	1.404	0.751	0.675	0.261	0.326	1.427	1.110
II	7	9	1.140	1.172	0.586	0.533	0.449	0.431	1.214	1.214
III	9	10	1.528	1.554	0.695	0.675	0.280	0.265	1.580	1.384
IV	6	7	1.303	1.355	0.727	0.696	0.331	0.310	1.036	0.969

A Small scale sites of 10hm<sup>2</sup> ; B Large scale sites of 40hm<sup>2</sup> ; I Farmland area ; II Rotational grazing area ; III Over grazing area ; IV Forbidden grazing area

**Conclusions** The species of high biomass of rodent communities changed significantly in rotational grazing and over grazing disturbances ; species numbers increased from 2 to 5 under two scales , from 10hm<sup>2</sup> to 40hm<sup>2</sup> , however , the species indices of high biomass (rodent communities) did not change between farmland and forbidden grazing disturbances , which also showed the disturbance effect of rodent communities under different disturbances and scales . The evenness indices of rodent communities appeared significant scaling effect .

### Reference

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