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## Research on Classification Criteria of Heitutan (Black Soil Beach) Degraded Grassland in Sanjiangyuan Region

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**Presenter Information**

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## Research on classification criteria of Heitutan (black soil beach) degraded grassland in Sanjiangyuan region

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**Key words :** Heitutan degraded grassland, classification criteria, alpine meadow, Qinghai-Tibet Plateau, Sanjiangyuan region

The severe problems of ecosystem environment in Sanjiangyuan, in which was the source of Yangzi, Yellow and Lan-Cang-jiang River in southern Qinghai of China, were extensively attracted by lots of researchers around the world, especially problems of Heitutan degraded grassland. To restore Heitutan degraded grassland on alpine meadow, the research of classification criteria of Heitutan (black soil beach) degraded grassland in Sanjiangyuan was conducted in this paper. The sites were located in Sanjiangyuan region, in which was part of Qinghai-Tibet Plateau. The Heitutan degraded grassland was formed by human activities, overgrazing, rodents and so on conditions, it was not a normal type. Its species composition, community structure, biodiversity, biological productivity, soil and micro-environment, and other aspects of the degraded grassland system have obviously changed compared with its original state of equilibrium or evolutionary succession in the natural system. Therefore, the indicators selected were not consideration climate factor, only selected the vegetation cover, a stone cover aboveground, advantages of four kinds of economic groups, edible forage ratio, the effective numbers and the average numbers of rodent holes, the average rate of rodent destruction, soil thickness, number of layers and slope, and elevation, as a total of 14 kinds of indicators of the degraded grassland for cluster analysis. Test plots were located in the seven counties of Sanjiangyuan areas, total of 45 plots. In each plot, the 14 indicators were determined, which above mentioned.

Using hierarchical cluster analysis of statistical software SPSS 11.50 to cluster, the cluster method adopted between-groups linkage. The coefficient of the distance adopted squared Euclidean distance. The scope of the changes in each index was relative larger, therefore, data standardization choice Range (-1, 1), and the graphics output using Dendrogram in the process of clustering.

According to key indicators of all degraded grassland, the classification criteria of Heitutan degraded grassland were sorted out from 45 plots in Sanjiangyuan (Table 1).

**Table 1** The classification criteria of Heitutan degraded grassland in Sanjiangyuan.

Heitutan degraded grassland	The average number of hole (per/ha)	Dominance poisonous weeds	The proportion of edible plants (%)	Stone coverage aboveground (%)	Vegetation coverage (%)	Cyperaceae dominance
Original type	0-400	0-20	70-100	0-10	80-100	30-50
Middle	400-1000	20-30	50-70	10-30	60-80	20-30
Severe	1000-4000	30-50	40-25	30-50	80-60	10-20
Extreme	>4000	>50	0-25	>50	0-50	0-10
Beach	Middle	<30	>55	<15	<30	>20
	Severe	1000-4000	30-50	25-55	15-50	30-80
	Extreme	>4000	>50	<25	>50	>80
Slope	Middle	<30	>55	<30	<30	>20
	Severe	1000-4000	30-50	25-55	30-50	30-80
	Extreme	>4000	>50	<25	>50	>80

Note: the beach slope:  $0^{\circ}$ - $7^{\circ}$ , slope gradient:  $7^{\circ}$ - $21^{\circ}$ .

Through cluster analysis methods, the classification criteria of Heitutan degraded grassland in Sanjiangyuan were researched. There are different classification criteria in different degraded grassland. From primary grassland to extreme degraded grassland, the numbers of grassland classification were 3, 12, 8 and 4 separately, because of community competition. This was showed that primary grassland and extreme degraded grassland type were both less number types than middle and severe degraded grassland, in which the community competition were of intensity. The Heitutan degraded grassland could be divided two kinds of ecological types, which were beach and slope. Each ecological type could be divided into middle, severe and extreme degraded grassland type. The classification indicators of Heitutan degraded grassland included the average numbers of rodent holes, dominance poisonous weeds, the proportion of edible plants, stone coverage aboveground, vegetation coverage, and Cyperaceae dominance. Community types of extreme Heitutan degraded grassland were quite simple and their communities tend to stability. The change of degraded types of that was relative less, but in middle and severe degraded type, grassland vegetation was not stable, community competition was intense, and its community structure was complex, especially the middle degraded type. The management measures of all kinds of degraded grassland were proposed.