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Research on the Niche of Major Plant Population of the Barren Hillsides in the Arid Valley of the Upper Reach of the Minjiang River

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Research on the niche of major plant population of the barren hillsides in the arid valley of the upper reach of the Minjiang River

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Keywords. niche breadth; niche overlap; major plant population; barren hillsides; arid valley; upper reach of the Minjiang River

Abstract. The niche breadths and niche overlaps of *Selaginella pulvinata* and of other several main species of the herbaceous layer were measured at the barren hillsides in the arid valley of the upper reach of the Minjiang River. The results indicate that *Selaginella pulvinata* can distribute in various communities and adapt the environment of this region. Because all of them can express the highest ability to combat the draught and explore resources, the competitions among them can be found obviously. It is very useful for us to the vegetation recovery of the barren hillsides in the arid valley of the upper reach of the Minjiang River that had been damaged seriously by the 8.0 earthquake at 2:28pm on May 12th in Wenchuan, Sichuan Province, China.

Introduction

Since 1990s, the study and application of niche have been at the heart of modern ecology. In the one hand, it benefits the quantizing analysis of the interspecific relationship and the relationship between species and the Environment. In the other hand, it is also useful to the protection of biological diversity, natural ecosystems and wild animals and plants resources [1-2]. The niche differentiation is the basis of species coexistence and the impetus of the evolution [3]. The study of the plant niche is a way to analyze the succession dynamics of the forest and very useful for us to find the intraspecific and interspecific competition, guide the development of forestry produce and improve the plant species [4].

Because of the warm, dry wind and the growing influence of humanity, the vegetation is very poor, the forest cover is very low and the soil and water loss is very serious in the upper reach of the Minjiang River, thus offering the arid valley.

In recent years, a lot of studies focus on the arid valley of the upper reach of the Minjiang River, but few on the barren hillsides [5]. In the arid valley of the upper reach of the Minjiang River, it is very useful to the vegetation recovery of the barren hillsides that had been damaged seriously by the 8.0 earthquake at 2:28pm on May 12th in Wenchuan, Sichuan Province, China to measure the niche breadths and niche overlaps of the main species of the herbaceous layer.

Materials and methods

Study site

The study was carried out at the barren hillsides in the arid valley of the upper reach of the Minjiang River that runs mainly from north to south. It is located in the transitional belt from the Sichuan Basin to the Qinghai-Tibet Plateau and at 31°15'—32°32' N and 103°10'—103°54' E. The special climate and soil character of the arid valley makes the semi-desert landscape appear.

There are some shrubs and herbs, such as *Sophora viciifolia*, *Bauhiniafaberi*, *Berberiswilsonae*, *Wikstroemia chamaedaphne* Meissn, *Artemisia igniaria*, *Erodium stephanianum* Willd, *Lonicera japonica*, *Sedum multicaule*, *Oxyria sinensis* Hemsl, *Allium sikkimense*, *Capillipedium parviflorum*, *Carex lanceola*, *Artemisia sylvatica*, *Ranunculus japonicus* Thunb, *Setaria glauca*, *elaginella pulvinata*, *Sedum wenchllanens*, *Oxytropis ochrantha* Turcz., *Taraxacum maurocarpum*, *Allium ascalonicum* L. and *Lilium regale* Wilson [2, 3].