庞泉沟国家自然保护区森林群落的数量分类和排序

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摘要　　　根据84块样方资料，对庞泉沟国家自然保护区的森林群落进行TWINSPAN分类和DCA、DCCA排序。结果表明：(1)TWINSPAN将该区的森林群落分为7个类型；（2）样方与物种的DCA排序及样方的DCCA排序较好地揭示了该区森林群落的分布格局与环境梯度的关系：DCCA第一轴明显地反映出森林群落的海拔梯度，即热量因子，沿DCCA第一轴从左到右，海拔逐渐升高，森林群落对热量的要求降低；DCCA第二轴主要表现出森林群落的坡向、坡度变化趋势，即水分和光照因子，沿DCCA第二轴，从下到上，坡向由阴坡向阳坡变化，坡度由平缓变陡峭。其中海拔梯度是环境因子中对森林群落分布起决定性作用的因子。(3）与DCA相比，DCCA的排序轴更有利于生态意义的解释，后者能同时反映样方间在种类组成上及环境因子组成上的相似性，表现在排序图中样方较集中，群落间的界线变得较模糊，因此如果同分类结合使用，DCA的效果要好于DCCA。(4）TWINSPAN分类与DCA和DCCA排序的结果，同时表明了该地区森林群落的垂直分布格局。

关键词　　庞泉沟国家自然保护区；　　森林群落；　　　TWINSPAN；　　DCA；　　DCCA

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Numerical Classification and ordination of forest communities in Pangquangou National Nature Reserve

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Abstract　Pangquangou National Nature Reserve, established in 1986, is located in Shanxi Province at 37°45′～37°55′N，　111°22′～111°33′E. Its peak, Xiaowen mountain, is 2831m above sea level. The main protected objects are Crossoptlon mantchuricum and cold temperate coniferous forest in this reserve.Quantitative analysis of ecological relationships between vegetation and environment has become an essential means in research field of modern vegetation ecology. In this paper, based on data from 84 quadrates, forest communities in this reserve were investigated using TWINSPAN, DCA and DCCA. These results will be helpful to the construction and development of Pangquangou National Nature Reserve.

By TWINSPAN, the forest communities were classified into 7 types. The distribution pattern of vegetation reflects the comprehensive influence of environments. The results of DCA and DCCA clearly reflect the relationship between the pattern of forest communities　and environmental gradients. The ordination result of DCCA indicates that altitude is more important than other environmental factors, because the change of altitude gradient will lead to the varieties of temperature gradients and humidity gradients. The first of the DCA ordination axes indicates the humidity gradients, and the second of that indicates the temperature gradients. All these results show that the main factors restricting distribution of the communities are temperature and humidity in this reserve.

The ecological meaning of ordination axis in DCCA is much clearer than that in DCA, and the species-environment correlation of DCCA is more obvious than DCA. The first axis of DCCA indicates the altitude gradient among the communities, and the second axis is the gradient in aspect and slope among the communities. DCCA ordination can simultaneously express similarities of speci

es and environment. Therefore the quadrat location in DCCA ordination figure is much closer than in DCA.

The research results suggest that Larix principis-rupprechtii is widely distributed in this nature reserve at altitude from 1600 to 2500m. Picea spp. (P. meyeri and P. wilsonii) are mainly distributed in middle mountainous areas at altitude from 2000 to 2350m where Crossoptlon mantchuricum inhabits, so that this area should be primarily preserved.

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