

Major Progress in Biodiversity Achieved

In cooperation with Prof. James Brown of the New Mexico University, USA, a research team led by Prof. Fang Jingyun of the City and Environment College of Peking University published their latest research results on the mechanisms of biodiversity in the Proceedings of the National Academy of Sciences, (PNAS), US.

The increase of biodiversity (or species diversity) from poles to equator is one of the most pervasive features of the eco-system on earth. The study on its transformation and mechanism can be traced back to Darwin in the nineteenth century. In the last 20 years, research has become a focal point in bionomics, environmental sciences and conservation biology, along with the increasing attention to biodiversity by the international community.

The team led by Prof. Fang has been dedicated to the research on China's species diversity and its mechanisms for years. In cooperation with botanists all round the country, they have built up the database of Chinese tree distributions which includes about 11,000 samples, after investigating the plant diversity in about 60 major mountain areas in China. Moreover, they compare it with the database of North America to investigate the effectiveness of metabolic theory of ecology proposed by the research team led by James Brown, to explain the mechanisms of species diversity. The essence of the theory is that the environmental energy controls the metabolic speed and individual size of species, and thereby controls the magnitude of species. The team led by Fang discovered that the magnitude of species in China and North America does depend on the environmental energy, as predicted by the metabolic theory. However, the dimension of the space greatly affects the relationship between energy and species diversity, i. e. the metabolic theory has strong spatial dependence. The team also discovered that the relationship between species richness and energy is much steeper in eastern Asia than in North America. This leads to an important conclusion that, there exist more species in the warm southern East Asia than in southern North America with the similar climate, but in cold climates at high latitudes, there are more tree species in North America. The conclusion, also supported by field survey and investigations, changed the long held concept that the species diversity in East Asia is richer than that in North America.

The findings revealed the mechanisms of biodiversity in East Asia and North America, developed the metabolic theory and therefore are considered an important step towards the mechanical explanation of biodiversity.

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