

## 东灵山暖温带落叶阔叶次生林动态监测样地: 物种组成与群落结构

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### Species composition and community structure of the Donglingshan forest dynamic plot in a warm temperate deciduous broad-leaved secondary forest, China

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摘要

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**摘要** 群落结构状态是植被演替进程中的重要体现之一,同时也是下一步演替过程发生的基础。暖温带落叶阔叶次生林是中国暖温带森林植被的主要类型。为了更好地研究其演替动态、生物多样性维持机制,我们参照巴拿马Barro Colorado Island (BCI) 50 ha热带雨林样地的技术规范,于2009年11月至2010年9月在北京门头沟区小龙门森林公园的暖温带落叶阔叶次生林内建立了一块20 ha的固定样地(简称DLS),对样地内胸径 $\geq 1$  cm的所有木本植物进行了鉴定、调查及定位,分析了群落的组成和结构。结果表明,样地内木本植物有58种,隶属于18科33属。独立个体的总数为52,136,包括独立个体分枝的总数为103,284,全部为落叶树种。群落的区系类型以北温带成分居多,同时混有一些亚热带和热带成分,属典型的温带森林类型。群落优势种明显,个体数最多的前5个种的个体数占到总个体数的61%,前20个种占到92%,而其余38个种只占8%。群落成层现象明显,垂直结构由主林层(19个种)、次林层(18个种)和灌木层(21个种)组成。样地所有木本植物个体总径级分布呈倒“J”型,群落更新良好。主林层树种的径级结构近似于双峰或正态分布,而次林层和灌木层树种则表现出倒“J”型或“L”型。几个主要树种的空间分布表现出不同的分布格局,随着径级增大,聚集程度降低。空间分布格局显示主要优势种自身个体在其径级大小的空间分布上互补,不同径级的个体占据了样地内不同的空间位置。

**关键词:** 群落组成 空间格局 生物多样性 演替动态 天然次生林 东灵山

**Abstract:** Community structure is one of the key features in the process of vegetation succession. Warm temperate mixed deciduous broad-leaved secondary forest is the main forest vegetation type in China's warm temperate zone. In order to better study the mechanisms of succession and species coexistence in this forest type, we established the Donglingshan 20-ha forest plot (DLS plot) in 2009 and 2010 using the same protocol as the well-established plot on Barro Colorado Island in Panama. In the plot, all free-standing woody plants with DBH (diameter at breast height)  $\geq 1$  cm were mapped, tagged, and identified to species. Here, we address preliminary results on floristic characteristics, community composition, and size-class, vertical, and spatial structure of the DLS plot. These datasets will serve as baseline information accessible to a wide range of future studies. We tagged a total of 52,136 genotype individuals (103,284 individuals including branches of genotype individuals), belonging to 58 species, 33 genera and 18 families. All of these tree species were deciduous. Floristic characteristics of the community suggested a temperate flora, including some subtropical and tropical elements. There were very obvious dominant species in the plot. Five species comprised 61% of all individuals, and 20 species comprised 92% of all individuals, while the other 38 species comprised only 8% of all individuals. Vertical structure was composed of an overstory layer (19 species), midstory layer (18 species), and a shrub layer (21 species). The DBH size-class structure of all species in the plot generally fitted a "reverse J" distribution, indicating good regeneration across the community. The size-class structure of the main species in the overstory layer showed a bimodal or nearly normal distribution, while the most abundant species in the midstory and shrub layers showed "reverse J" or even "L" distributions. Spatial distribution patterns of the dominant species varied with size-class and scale and shifted from closer aggregation to looser aggregation from small to adult or old trees. The size-class spatial distribution patterns of the dominant species showed the different diameter levels of their own individuals occupied different spatial positions in the plot.

**Keywords:** community composition spatial pattern succession dynamics natural secondary forest Donglingshan Mountain

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