

研究论文

# 开封地区不同土地利用方式农田杂草群落结构及动态

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**摘要** 2005年春、秋两季对开封地区不同土地利用方式小麦-玉米、小麦-大豆轮作地, 葡萄地, 弃耕地中杂草进行调查, 统计分析各杂草群落中物种相似系数、物种相对多度分布、功能群相对多度和生物多样性。杂草功能群分为单子叶短期生植物(MA)、双子叶短期生植物(DA)、单子叶多年生植物(MP)及双子叶多年生植物(DP) 4个功能类群。调查共记录杂草种类71种, 隶属27个科; 春季51种、共同种7个, 秋季36种、共同种8个。不同土地利用方式杂草群落相似系数春季各群落间0.3~0.5, 秋季玉米地-大豆地、秋葡萄地-弃耕地最高, 分别是0.73和0.70; 季节间小麦地与秋季各杂草群落间相似系数小于0.1。春、秋季弃耕地物种-相对多度分布曲线下降缓慢, 常见种和偶见种多、相对多度分配分别占61.32%和47.09%; 小麦地、玉米地、大豆地和葡萄地优势种突出。春季DA功能群占优势, 小麦地高达81.06%; MP功能群较少, 小麦地缺少MP。秋季玉米地和大豆地杂草功能群分布较均衡, 葡萄地以DA和MP为主、分别为42.34%和42.64%; 弃耕地MA、DA和MP平均, 为33.63、31.07和30.25%。多样性指数为春、秋季弃耕地最高1.76和1.72, 玉米、大豆地次之为1.55和1.52, 春、秋葡萄地1.49、1.30, 小麦地最低1.12。结论: 不同土地利用方式杂草群落种群构成不同, 功能群相对多度分配格局以免耕农田玉米地、大豆地和葡萄地杂草功能群分布均衡; 功能群季节变化明显, 趋势为MP上升, DA下降。不同土地利用方式土地多样性等级为小麦地<葡萄地<大豆地和玉米地<弃耕地。

**关键词** 杂草; 群落; 功能群; 土地利用方式; 生物多样性

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## Community structure and dynamics of agricultural weeds under different land utilization regimes in Kaifeng area

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**Abstract** In the spring and the autumn of 2005, investigations were conducted on weed species in plots of various land utilization regimes, including wheat-corn and wheat -soybean rotation fields, vineyards, and abandoned agricultural land, in Kaifeng city. Coefficient of species similarity, relative abundance of species, relative abundance of functional group, as well as biodiversity, was analyzed. Weed community was classified into four functional groups, including monocotyledonous ephemeral (MA), dicotyledonous ephemeral (DA), monocotyledonous perennial, and dicotyledonous perennial group (DP). A total of 72 weed species, belonging to 27 families, were recorded in this investigation. In the spring, there were 51 species, 7 of which occurred in all plots (ubiquitous). In the fall, there were 36 species, 8 of which occurred in all plots. In the spring, coefficient of weed community similarity fell between 0.3 and 0.5; in the autumn, it reached the highest values of 0.73 and 0.70 for the maize-soybean pair, and vineyard-abandoned agricultural land pair, respectively. In both the spring and the autumn, coefficient of weed community similarity between wheat field and each of the other field types was less than 0.1. In both the spring and the autumn, relative abundance of abandoned agricultural land species showed gently declining curves, ubiquitous species and rare species were both abundant; relative abundance of ubiquitous and rare species was 61.32% and 47.09%, respectively. Relative abundance of wheat field, maize field, soybean field, and vineyard species however yielded curves of significantly steeper slopes; sp

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species dominance was prominent and the DA functional group reigned supreme in the spring, accounting for 81.06% of the species abundance in wheat fields. The MP functional group was relatively rare, being entirely non-existent in wheat fields. In the autumn, corn and soybean fields had relatively even distribution of weed functional groups; vineyards were dominated by the DA and MP functional groups, which had relative abundance of 42.34% and 42.64%, respectively; abandoned agricultural land was evenly shared by the MA, DA, and MP functional groups that respectively had relative abundance of 33.63%, 31.07%, and 30.25%. Abandoned agricultural land had the highest diversity index values of 1.76 in the spring and 1.72 in the autumn; diversity index of corn fields and soybean fields was respectively 1.55 and 1.52; for vineyards, this value was 1.49 in the spring and 1.30 in the autumn; wheat fields had the lowest diversity index value of 1.12. The results show that: weed community compositions were different under different land utilization regimes; the functional groups had relatively even abundance distributions in un-plowed maize fields, soybean fields, and vineyards; there were significant seasonal variations of functional groups- between the spring and the autumn, the MP functional group grew in abundance, while the DA functional group declined. For the different land utilization regimes investigated, biodiversity ranking was wheat field < vineyard < soybean and corn field < abandoned agricultural land.

**Key words** community \_ functional group \_ land utilization types \_ biodiversity

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