

植物保护科学

除草剂对蓼苣菊化感作用的影响研究

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摘要:

化感作用是形成植物群落、决定植物群落中植物种类组成、引起植物群落演替的重要内在因素, 是外来植物成功入侵的重要机制。植物化感物质的产生、释放及其效应强弱除了与植物的内在特性有关外, 在很大程度上取决于植物生存的环境。本研究运用野外实验和室内生测法, 以触杀型除草剂百草枯、传导型除草剂草甘膦和选择型除草剂稳杀得的不同剂量(1/4倍推荐剂量、1/2倍推荐剂量、1倍推荐剂量)的药液处理蓼苣菊, 对施药蓼苣菊进行动态取样, 以小白菜为受体检测其化感作用在不同除草剂胁迫下的化感变化规律。研究表明: (1)在施药后40天内, 施药蓼苣菊的化感作用强度变化幅度大于对照, 但这种表现在质量浓度为0.5g/ml提取液下才明显; (2)不同种类除草剂使蓼苣菊化感作用强度达到最大的时间均在施药后的第20天; (3)施药蓼苣菊的化感作用强度经一定的波动后, 最后几乎都恢复到对照水平; (4)不同除草剂相同施药水平(1/4倍推荐剂量、1/2倍推荐剂量、1倍推荐剂量)下的同质量浓度提取液的化感作用强度有很大的差异, 这可能与除草剂的作用强度和机理有关; (5)蓼苣菊的化感成分不随施药与否、施药浓度高低、生长阶段而改变。综上所述, 化学除草剂在一定的时间内增强了蓼苣菊的化感作用, 从而增强了其入侵潜力。

关键词: 除草剂 蓼苣菊 化感作用 入侵潜力

The effect on allelopathy of *Wedelia chinensis* Merr. resulting from herbicide

Abstract:

Allelopathy is the important intrinsic factor in forming plants community, deciding the plants categories on plants community and causing the plants community to evolve, and it is also the important mechanism in the successfully invading of invasive plants. To produce and release the allelochemicals and the strength of its effect of plants largely depend on their living environment besides their inherent characteristics. *Wedelia chinensis* Merr., which was proved to have allelopathy, has spread throughout the agroecosystem and wilderness in Liaoning, Jiangsu, Zhejiang, south China etc. Herbicide, a stronger environmental factor for most weeds, was widely used in the prevention of *C. chinensis*. But if herbicide will affect its exudation and change the allelopathic effect eventually? The present research was projected to answer it. In this study three different categories of herbicides, Paraquat, Glyphosate and Fluzifop-butyl, were selected and sprayed to the *C. chinensis* populations in field at three different concentrations (one fourths of recommend dosage, half of dosage and recommend dosage). The *C. chinensis* was sampled every 10 days after sprayed herbicides. Cabbage seeds were used to test the allelopathic trends. The results demonstrated: (1) Within 40 days after sprayed herbicides, the variation range of allelopathy from sprayed *C. chinensis* population was wider than contrasting ones, but this characteristic only appeared apparently at 0.5g/ml; (2) Three different categories of herbicides resulting in a same peak allelopathy time, the 20th day; (3) Allelopathy of *C. chinensis* stressed by herbicides almost rebounded to contrasting samples after certain fluctuation; (4) Significant differences of allelopathy appeared at the same concentration extracts stressed by the same level (one fourths of recommend dosage, half of dosage and recommend dosage) of different categories of herbicides, it maybe have relations with the mechanism and intensity of the herbicides; (5) The components of allelochemicals did not change with the herbicide, the concentrations of herbicide and the stage of plants. All the above indicate chemical herbicides strengthen the allelopathy of *C. chinensis* within some period and make its invasive potential strengthen.

Keywords: Herbicide *Wedelia chinensis* Merr. Allelopathy Invasive potential

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