

基于 Web of Science 化感作用研究文献计量分析

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摘要: 化感作用是生态系统中普遍存在的一种现象, 是指植物通过释放化学物质到环境中而影响自身或其他有机体(包括植物, 微生物及动物)的生长发育, 是植物的一种适应机制, 长久以来, 化感作用被认为能够影响生物群落的个体表现、群落结构和物种入侵, 在森林生态系统中, 入侵植物产生的化感物质通过直接或间接的方式来抑制本土植物的生长, 为入侵者提供竞争优势。文献计量分析方法是指通过对某一研究领域进行定量分析, 实现该领域内的热点研究并对相关内容进行可视化, 有助于研究人员对相关领域的研究热点和发展趋势进行评。本文采用文献计量法, 在 Web of Science 核心合集数据库中检索了 1999~2022 年主题为“Allelopathy”的论文, 经过筛选得到 4856 篇有效文献, 利用 VOSviewer 软件和 Excel2022 软件分析了在该时间段的发文量、主要发文机构、高频被引文章、关键词共现分析等。结果显示: 对化感作用研究主题的发文量整体上呈现波浪式增长趋势, 但高被引文章较少, 且被引前十位的文章发表年限均距今 10 年以上, 发文质量仍有待提高。由于近年来的多学科交叉的研究, 化感作用研究在农业、植物科学, 生态环境科学方向、生化与分子生物学、海洋与淡水生物水等热门学科均有涉及, 主要以中国和美国为主, 占到总发文总量的 40.10%。其中, 发文较多的作者是 Kato-noguchi H、Fujii Y 和 Macias FA, 该三人不仅对化感作用研究领域均有卓越的贡献, 更是各国家之间合作的强有力推进者。对关键词共现分析可知, 目前对该领域的研究主要集中在物种入侵、农业生产、化感物质和作用机理研究等, 自然状态下的植物化感作用机理十分复杂, 这说明对该领域的研究仍存在空缺, 将化感作用机理与土壤和分子生物学学科结合, 培育优质高产的品种, 在群落竞争和种群调节中的生态作用不可忽视, 同时也可以很好的保护本土物种多样性, 维持生态系统的平衡, 也包括克服作物的连作障碍、控制杂草生长, 新型除草剂的研发以及新品种的培育都是化感作用在农业生态学系统中现在及未来的热点话题。化感作用研究具有十分重要的应用前景, 对实现林业和农业生产等的可持续发展也有重要意义。

关键字: 化感作用; Web of Science 核心合集数据库; 可视化分析

Dynamic research and hotspot analysis of allelopathy based on bibliometric method

Abstract: Chemogenesis is a common phenomenon in the ecosystem. It refers to the growth and development of plants or other organisms (including plants, microorganisms and animals) by releasing chemicals into the environment. It is an adaptive mechanism of plants. For a long time, chemification has been thought to affect the individual manifestation, community structure and species invasion of biological communities, and in forest ecosystems, chemification substances produced by invasive plants inhibit the growth of native plants by direct or indirect means. Provide a competitive advantage for intruders. The method of literature metrology analysis refers to the quantitative analysis of a certain research field to realize the hot research in this field and visualize the relevant content, which is helpful to researchers to evaluate the research hot spots and development trends in relevant fields. In this paper, the paper entitled "allelopathi" was retrieved from 1999 to 2022 in the Web of Science core collection database, and 4856 effective literatures were selected. VOSviewer software and Excel2022 software were used to analyze the amount of issuance, major publishing institutions, high-frequency citation chapters, keyword synpresent analysis, etc. The results show that the amount of hair on the research topic of chemosensitization shows a trend of wave growth on the whole, but there are fewer citation papers, and the number of articles listed in the top 10 places

is more than 10 years old, and the quality of writing remains to be improved. Due to the interdisciplinary research in recent years, the research on chemogenesis has been involved in agriculture, plant science, ecological and environmental science direction, biochemical and molecular biology, Marine and freshwater biowater and other hot disciplines, mainly China and the United States, accounting for 40.10 percent of the total amount of published literature. Among them, Kato-noguchi h, fujii Y and Macias FA, the authors who have published a lot of paper, have not only made outstanding contributions to the research field of chemical-effect, but also made a strong impetus for cooperation between countries. In the analysis of keywords co-occurrence, it can be seen that at present, the research on this field is mainly focused on species invasion, agricultural production, chemical matter and mechanism of action, etc This shows that there is still a vacancy in the study of the neighborhood. Combining the mechanism of chemogenesis with the discipline of soil and molecular biology, the ecological role of high-quality and high-yield varieties in community competition and population regulation cannot be ignored. At the same time, it can also well protect the diversity of native species, maintain the balance of the ecosystem, and also include overcoming the obstacles to crop succession and controlling weed growth. The research and development of new herbicide and the cultivation of new varieties are hot topics in the agricultural ecology system. The study of chemialoid plays an important role in application and is of great significance to the sustainable development of forestry and agricultural production .

Key words: allelopathy; web of science core collection database; visual analysis