

水芹 (*Oenanthe javanica*) 浸出液对小球藻 (*Chlorella vulgaris*) 生长及超微结构的影响

袁亚光, 李思宇, 宰学明, 钦佩

南京大学盐生植物实验室

Effects of *Oenanthe javanica* Extracts on Growth and Ultrastructure of *Chlorella vulgaris*

YUAN Ya-Guang, LI Si-Yu, ZAI Xue-Ming, QIN Pei

Halophyte Research Laboratory, Nanjing University

摘要

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摘要 采用在不同浓度水芹 (*Oenanthe javanica*) 浸出液中纯培养小球藻 (*Chlorella vulgaris*) 的方法, 研究水芹浸出液对小球藻细胞数量、叶绿素含量和藻细胞超微结构的影响。结果显示, $10 \text{ g} \cdot \text{L}^{-1}$ 水芹浸出液对小球藻的生长和叶绿素含量具有明显的促进作用; $20 \text{ g} \cdot \text{L}^{-1}$ 水芹浸出液处理组藻细胞数量和叶绿素含量增加持续至第7天, 但增幅低于对照组, 7 d后抑制作用增强; 高浓度 ($30 \sim 50 \text{ g} \cdot \text{L}^{-1}$) 水芹浸出液对小球藻细胞数量和叶绿素含量的抑制作用在第5天开始变得显著, 并随时间延长而加剧, 具有浓度效应; 经 $40 \text{ g} \cdot \text{L}^{-1}$ 水芹浸出液处理后, 小球藻细胞壁断裂甚至消失, 细胞中叶绿体片层肿胀甚至解体, 核膜破裂, 核质外渗。结果表明水芹浸出液对小球藻具有化感效应, 总体呈现低浓度促进、高浓度抑制的规律。

关键词: 水芹 浸出液 小球藻 化感作用 叶绿素 超微结构

Abstract: Pure culture of chlorella was done in solutions different in concentration of *Oenanthe javanica* extracts added, to explore effects of *O.javanica* extracts on growth, chlorophyll content and ultrastructure of chlorella. Results show that in the treatment of $10 \text{ g} \cdot \text{L}^{-1}$ *O.javanica* extract growth of chlorella was significantly promoted, and in the treatment of $20 \text{ g} \cdot \text{L}^{-1}$ *O.javanica* extract the number of cells and chlorophyll content of chlorella increased with a margin narrower than that in the control in the first 7 days, and afterwards, the growth was inhibited. In the treatments of $30 \sim 50 \text{ g} \cdot \text{L}^{-1}$ *O.javanica* extract, phenomenon of the inhibition became obvious on the fifth day and more obvious with the time going on and with the increasing concentration of the extract added as well. In the treatment of $40 \text{ g} \cdot \text{L}^{-1}$ *O.javanica* extract, cell walls of the algae broke up and even vanished, chloroplast lamellas in the cells swelled and even disintegrated, and karyolemmas ripped with karyoplasm extravasating. The findings indicate that *O.javanica* extract had an allelopathic effect on chlorella, and when low in concentration, it promotes growth of the algae, but when high, it acts reversely.

Keywords: *Oenanthe javanica* extracts *Chlorella vulgaris* allelopathy chlorophyll ultrastructure

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Corresponding Authors: 宰学明 金陵科技学院园艺学院钦佩 南京大学盐生植物实验室 Email: zaixueming680825; qinpei@nju.edu.cn

About author: 袁亚光 (1987—), 男, 江苏泰兴人, 硕士生, 主要从事湿地生态方面的研究。E-mail: yuanyaguang@126.com

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