



大丽轮枝菌致萎毒力指示菌的筛选及拮抗作用初探

王世英¹, 姜军坡¹, 李术娜¹, 朱宝成¹, 薛庆林^{2*}

1. 河北农业大学生命科技学院, 河北 保定 071001; 2. 河北农业大学植物保护学院, 河北 保定 071001

Preliminary Study on Screening and Antagonistic Mechanism of Indicator Microbe for Wilting Toxin from *Verticillium dahliae*

WANG Shi-ying¹, JIANG Jun-po¹, LI Shu-na¹, ZHU Bao-cheng¹, XUE Qing-lin^{2*}

1. College of Life Science, Agricultural University of Hebei, Baoding, Hebei 071001, China; 2. College of Plant Protection, Agricultural University of Hebei, Baoding, Hebei 071001, China

摘要

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摘要 为了筛选可指示 *Verticillium dahliae* 致萎毒素毒力大小的指示菌, 并对致萎毒素抑制指示菌生长的机理进行初步探讨, 采用指示菌平板打孔法, 对黑曲霉 (*Aspergillus niger*) BF-3758、枯草芽孢杆菌 (*Bacillus subtilis*)、金黄色葡萄球菌 (*Staphylococcus aureus*)、啤酒酵母 (*Saccharomyces cerevisiae*) 等 12 种具有微生物种属代表性的菌株进行筛选; 采用拮抗试验、致萎试验结合显微观察的方法, 初步探索了 *Verticillium dahliae* 致萎毒素对指示菌生长的抑制作用。结果表明, *Verticillium dahliae* 粗毒素对 *Aspergillus niger* BF-3758 的生长具有较强的抑制作用, 且该抑制作用和粗毒素对离体叶片的致萎作用具有一致性, 并存在一定的量效关系, *Aspergillus niger* BF-3758 菌株可以作为 *Verticillium dahliae* 致萎毒素的毒力指示菌; *Verticillium dahliae* 粗毒素可抑制 *Aspergillus niger* BF-3758 的孢子萌发和菌丝生长, 对成熟菌丝也有破坏作用。上述研究可为评价 *Verticillium dahliae* 的致病力提供一种操作简便、耗时短、费用低的生物学方法。

关键词: 指示菌 拮抗作用 筛选 毒素 大丽轮枝菌

Abstract: With the crude toxins prepared from *Verticillium dahliae* Kleb fermentation liquid, indicator microbe which could indicate the toxicity level of wilting toxin of *V. dahliae* was screened out from 12 representative strains, such as *Aspergillus niger* BF-3758, *Bacillus subtilis*, *Staphylococcus aureus*, *Saccharomyces cerevisiae* etc, by disk diffusion method. Using of antagonistic test and causing wilt test with microscope method, the antagonistic mechanism of indicator microbe for wilting toxin from *V. dahliae* was investigated. From the results of screening of indicator microbe, it was found that crude toxins extracted from *V. dahliae* showed strong inhibition on the growth of *A. niger* BF-3758. There was the concordance between the inhibition and the causing wilt effect of crude toxins to cotton leaves ex vivo. And there was the relationship between quantity of crude toxins and wilt effect. Strain *A. niger* BF-3758 was screened as the indicator microbe. It was found that the spore germination and mycelial growth of *A. niger* BF-3758 could be inhibited by the crude toxins. An easy manipulating, short time consuming, and low costing microbiological method for evaluating the wilt causing effect of *V. dahliae* was provided from the research

Keywords: indicator microbe inhibition screening toxin *Verticillium dahliae*

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通讯作者: qlxuey@126.com

作者介绍: 王世英 (1963-), 男, 副教授, 硕士生导师, wsy99999@126.com

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