

## 镰刀菌发酵液对大豆胞囊线虫的抑制作用

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**摘 要:**在大豆胞囊线虫(*Heterodera glycines*)自然衰退土壤中分离得到3株镰刀菌, F-9—禾谷镰孢菌(*F. graminearum* Schwabel), F-2、F-15—尖孢镰孢芬芳变种(*F. oxysporum* var. *redolens*(Wollenw) Gordon)。实验室条件下, 研究了这3株镰刀菌发酵液原液对大豆胞囊线虫卵孵化及对二龄幼虫(J<sub>2</sub>)活性的影响。结果表明: F-2、F-9发酵液原液分别抑制了95.7%和95.2%的大豆胞囊线虫卵孵化, 与对照组无菌水差异极显著; F-9发酵液原液在1 h时抑制J<sub>2</sub>活性高达90%, F-2发酵液原液在72 h时使全部的J<sub>2</sub>致死; F-15对J<sub>2</sub>不具有抑制性。F-2、F-15为同种的不同菌株, 但是作用效果存在差异。

**关键词:**禾谷镰孢菌; 尖孢镰孢芬芳变种; 发酵液; 大豆胞囊线虫; 生物防治

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## Inhibition of *Fusarium*. spp Fermented Filtrates on Soybean Cyst Nematode

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**Abstract:** In soybean cyst nematode suppressive soil, we isolated one *F. graminearum* (F-9) and two *Fusarium oxysporum* var. *redolens* (F-2, F-15). The objective was to determine the effects of *Fusarium*. spp fermented filtrates on second-stage juveniles (J<sub>2</sub>) and eggs of *Heterodera glycines*. The results showed that F-2, F-9 filtrates inhibited the nematode egg hatching by 95.67% and 95.17% respectively, it was extremely significant difference compared with water. F-9 filtrates were toxic to J<sub>2</sub> up to 90% after 1 h. F-2 filtrates were toxic to 100% of J<sub>2</sub>. F-15 filtrates had no effect on J<sub>2</sub>. F-2 and F-15 were the same species, but had different effects.

**Key words:** *Fusarium oxysporum* var. *redolens*; *F. graminearum*; Fermented filtrates; Soybean cyst nematode; Bio-control

大豆胞囊线虫(*Heterodera glycines*)是一种土传的定居性内寄生线虫, 是危害世界大豆的主要病害之一<sup>[1]</sup>, 每年造成严重的经济损失。目前防治大豆胞囊线虫主要采用化学农药的杀线剂, 虽然见效迅速, 但会增强线虫的抗药性, 而且对土壤生态环境不利。近年来生物防治越来越受到重视, 特别是菌株次生代谢产物的研究与开发<sup>[2]</sup>, 利用代谢产物控制线虫病害已成为线虫防治的重要发展方向, 而且目前已经取得了一些进展。淡紫拟青霉(*Paecilomyces lilacinus*)的代谢物对大豆胞囊线虫有很明显的抑制作用<sup>[3]</sup>。Sn90真菌代谢物原液及不同稀释液对大豆胞囊线虫呈梯度抑制作用<sup>[4]</sup>。该文在实验室条件下, 研究探讨了3株镰刀菌发酵液原液对大豆胞囊线虫卵孵化及二龄幼虫活性的影响, 旨在为生产中大豆胞囊线虫的生物防治提供理论依据。

### 1 材料与方法

#### 1.1 供试材料

1.1.1 菌株 供试镰刀菌株编号分别为: F-9—禾谷镰孢菌(*F. graminearum*), F-2、F-15—尖孢镰孢芬芳变种(*F. oxysporum* var. *redolens*)<sup>[5,6]</sup>, 于2009年分离自中国科学院海伦农业生态试验站大豆长期连作(19 a)定位区大豆根围土壤中。该小区已出现大豆胞囊线虫自然衰退现象<sup>[7]</sup>, 即大豆长期连作后胞囊线虫数量减少。

1.1.2 大豆胞囊线虫 研究所园区试验地大豆田, 3号生理小种。

#### 1.2 试验方法

1.2.1 镰刀菌发酵液的制备 供试菌株在PDA培养基上28℃暗培养4 d后, 无菌操作条件下, 打直

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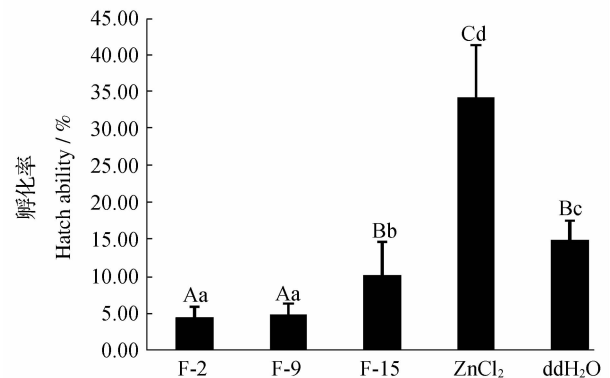
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