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一株拮抗放线菌的鉴定及其对黄瓜枯萎病的生防效应研究

Identification and biocontrol effect of a strain of actinomycete antagonistic to wilt disease of cucumber

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中文摘要:

鉴定从土壤中分离的一株拮抗放线菌(编号CT205),探索其防治植物病害的潜能。通过形态特征、生理生化特征和16S rRNA基因序列分析研究菌株CT205的分类地位,采用平板对峙法测定其抗菌活性,利用连作致病土盆栽试验评价其对黄瓜枯萎病的防治作用。初步鉴定菌株CT205为白刺链霉菌(*Streptomyces albospinus*),菌株CT205对供试的枯草杆菌、啤酒酵母、小麦纹枯、土豆青枯等植物病原菌均有不同程度的抑制作用,其中对黄瓜枯萎病、西瓜枯萎病、烟草疫霉3种供试病原真菌的抑制作用较强。盆栽试验表明,施用放线菌CT205对黄瓜生长有一定的促生作用,对黄瓜枯萎病防治效果为51.85%,放线菌CT205菌液和有机肥复合制成生物有机肥,防治效果达81.85%。研究表明,放线菌CT205具有潜在的应用价值。

Abstract:

Morphological, cultural and physio-biochemical traits and 16S rRNA sequence was analyzed of a strain of actinomycete, separated from the soil of the Zijin Mountain in Nanjing, China and coded as CT205, for identification and orientation in the classification system. The PDA agar plate method was used to determine antifungal activity of Strain CT205 and a pot experiment using pathogenic soil from field that had been cultivated with cucumber consecutively for year was conducted to investigate the effect of Strain CT205 controlling cucumber Fusarium wilt. Based on the 16S rRNA sequence analysis, Strain CT205 was tentatively identified as *Streptomyces albospinus* (99% identity). And the pot experiment showed that the strain inhibited quite effectively *Fusarium oxysporum* f. sp. cucumerinum, *Fusarium oxysporum* f. sp. niveum, and *Phytophthora nicotianae*, and to a varying extent, *Bacillus subtilis*, *Saccharomyces cerevisiae*, *Rhizoctonia cerealis*, *Ralstonia solanacearum*. Besides its cucumber Fusarium wilt controlling efficiency being 51.85%, the strain promoted somewhat the growth of cucumber. When the strain was prepared with organic manure into complex biomanure, the disease controlling efficiency may reach as high as 81.85%. The findings demonstrate that the strain has certain potential application value.

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