

植物诱变育种 · 农业生物技术

绿色产色链霉菌E-219菌落的形态分化

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摘要:

菌株E-219由原始菌株CGMCC4.1119经⁶⁰Co γ诱变及原生质体融合等手段改造后所得, 本文通过分子荧光探针、荧光显微镜和电镜对绿色产色链霉菌E-219在固体基质表面的发育分化周期、斜面培养时间对阿维拉霉素产量的影响进行了研究, 以为工业发酵选择适当的斜面种子提供理论依据。试验表明该菌株菌落发育过程伴有间断性菌丝凋亡, 分生孢子的产生是活性菌丝分化的结果。与原始菌株相比该菌落形态呈现显著不同, 其孢子萌发形成杂色初生菌丝, 基内菌丝出现二次死亡(48h)及其中活性菌丝片段的二次快速生长, 分生孢子形成数量多。原始菌株呈螺旋状孢子丝, 孢子表面带刺, 而E-219为直线型孢子丝, 分生孢子表面光滑无刺。摇瓶试验表明, 菌种斜面种龄以106h左右为宜, 此时分生孢子活性高, 阿维拉霉素发酵单位可达1200mg/L。

关键词: 绿色产色链霉菌 形态发育分化 斜面培养 荧光染色 种龄

MORPHOLOGICAL DIFFERENTIATION OF *Streptomyces viridochromogenes* E-219 ON SOLID CULTURE

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Abstract:

The *Streptomyces viridochromogenes* E-219 was derived from *Streptomyces viridochromogenes* CGMCC4.1119 treated with ⁶⁰Co γ-rays irradiation and protoplast fusion. With the help of fluorescent probes, fluorescence microscope and electron microscopy, the morphology and development of E-219 on solid surface culture were investigated in this study. The effect of agar slant culture time on the production of Avilamycin was also studied to provide theoretical basis for industrial fermentation of selecting the appropriate seed to culture on the agar slant culture medium. The results implied that the development of colonies of *Streptomyces viridochromogenes* accompanied the intermittent hyphae apoptosis, and the production of spores was from the active mycelium. The colonial morphology of strain E-219 was significantly different from the original strain CGMCC4h1119. There were variegated hyphae formation in the stage of spore germination and initial hyphae development (10h) with the live and dead segments alternated in a highly regular fashion within the same hypha. After the early single colony formation, the third phase was followed by profuse growth of the live segments derived from the variegated hypha, then the second apoptosis of the mycelia (48h) was occurred with another quick growth, and sporulation was occurred at 96h. Strain CGMCC4.1119 had spiral sporotrichial and round conidiophores with spike, whereas strain E-219 had linear sporotrichial, smooth and cylindrical conidiophore. The results of shake flask experiments indicated that the spores of E-219 had the highest activity when cultured on agar slant culture medium and incubated for 106h with the production of avilamycin up to 1200mg/L.

Keywords: *Streptomyces viridochromogenes* morphological differentiation agar slant culture time fluorescence staining agar slant culture time

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