

# 电旋转技术用于少根根霉孢囊孢子介电性的测定

王学仁  
西安联合大学生物系

利用电旋转技术研究了少根根霉(*Rhizopus arrhizus*)孢囊孢子的电旋转谱,在发现另外两个峰的同时,在场频500Hz附近又发现了1个明显的正旋转峰。同时还发现萌发孢囊孢子与休眠孢囊孢子的电旋转谱有明显的差别,其负旋转峰值明显地小于休眠孢囊孢子的负旋转峰值。借助经修改的椭圆细胞双壳模型(two-shell model)模拟出了原生质膜和原生质的电常数,结果表明萌发孢子的原生质膜和原生质的电导率较休眠孢子的相应电导率有明显增大。说明电旋转技术能够反映活细胞的生理变化。

## INVESTIGATION ON DIELECTRIC PROPERTIES OF RHIZOPUS ARRHIZUS SPORANGIOSPORES BY ELECTROROTATION

The rotational spectra of sporangiospores of *Rhizopus arrhizus* are investigated by the technique of electrorotation. Besides one co-field peak and one anti-field peak in higher frequency regions, another distinct co-field peaks were found for the living spores at frequency range around 500Hz. In addition, the differences in the spectra between the dormant sporangiospores and the germinating ones were exhibited by electrorotation. The Anti-field peaks of the spectra of the germinating were smaller in size than those of the dormant. Employed a modified two-shell model for ellipsoidal cells, the dielectric properties of the both spores were deduced from experimental data by mathematical simulation. As a result, the conductivities of proto-plasm membrane and cytoplasm of the germinating sporangiospores are respectively increased obviously than those of the dormant ones.

### 关键词

少根根霉(*Rhizopus arrhizus*); 孢囊孢子(Sporangiospores); 介电特性(Dielectric properties); 电旋转(Electrorotation); 电动技术(Electrokinetic techniques)