Preparation, Characterization, and Biotransformation of the Inclusion Complex of Phytosterols and Hydroxypropyl- cyclodextrin by *Mycobacterium neoaurum*

Wenjun Wang^{a,b} and Longjiang Yu^{b,*}

^a Key Lab for Bioengineering of the State Ethnic Affairs Commission, College of Life Science, South-Central University for Nationalities, Wuhan 430074, P. R. China

^b Institute of Resource Biology and Biotechnology, College of Life Science and Technology, Huazhong University of Science and Technology, Wuhan 430074, P. R. China. E-mail: yulongjiang@mail.hust.edu.cn

* Author for correspondence and reprint requests

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The inclusion complex of hydroxypropyl- -cyclodextrin (HB CD) and phytosterols (PSs) was prepared and characterized by thermogravimetric analysis (TGA) and infrared (IR) spectroscopy. Biotransformation of the inclusion complex of phytosterols and hydroxypropyl-cyclodextrin (PSs-HB CD) by *Mycobacterium neoaurum* to 1,4-androstadiene-3,17-dione and 4-androstene-3,17-dione [AD(D)] was studied. The TGA and IR results indicated that the thermal stability of PSs was improved in the complex with HB CD. Biotransformation improved the solubility of PSs in the aqueous medium a lot because the AD(D) production was increased remarkably compared with the control, but growth of the bacteria was inhibited in the presence of HB CD. The optimal inclusion ratio, ultrasonic treating time, dosage, and time of addition of PSs-HB CD complexe were found to be 2:1, 10 min, 1.5 g/30 ml medium, and 48 h after incubation, respectively. This inclusion technique not only increased the availability of the substrates for the microorganisms, but also the capability of these microorganisms to produce AD(D) from PSs.

Key words: Phytosterol, Hydroxypropyl- -cyclodextrin, Mycobacterium neoaurum