Mulberry red pigment with high purity produced by whole-cell bioconversion in an aqueous two-phase system

Ting Huang[1], Yi-Tong Li[1], Shuai You[1, 2], Fu-An Wu[1, 2], Jun Wang [1, 2*]

[1] School of biotechnology, Jiangsu University of Science and Technology, 212010 Zhenjiang, China;
[2] Sericultural Research Institute, Chinese Academy of Agricultural Sciences, 212010 Zhenjiang, China
Key words: Mulberry, anthocyanin, bioconversion, whole-cell biocatalysis, aqueous two-phase system.
Presenting author email: wangjun@just.edu.cn

Nowadays Large numbers of mulberry fruits are discarded every year, owing to imperfect preservation technology. However, cyanidin-3-*O*-glucoside in defective mulberries, is safe and nontoxic, and is recognized as a suitable source of anthocyanins in nature. Therefore, a novel aqueous two-phase system with whole-cell biocatalyst was constructed to enhance the C_3G content in red pigments from defective mulberry fruits for the first time. And its separation characteristics and reaction rules were analyzed, which conforms to the significance of green chemistry. The cyanidin-3-*O*-rutinoside conversion was 66.56% within 1.5h, and the purity of C_3G in the product was 84.2% with an increase of 24%. High recovery efficiency of C_3G as much as 96% was obtained. The reusability of the whole-cell biocatalyst in aqueous two phases was high, and it could be reused 5 times, maintaining a relative activity over 50%. Over all, a kind of high-quality red mulberry pigments was prepared using the innovative system quickly and effectively, and would be of great significance for reuse of bioresources.