

Studies on the Biosynthesis of Triterpenes in Camellia Oil

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Camellia oil is used as a base material in oil-based cosmetics, and rates high quality oil due to high composition of oleate glycerides. In addition to fatty acid glycerides, camellia oil contains triterpenes as minor constituents. Although effectiveness of triterpenes in camellia oil is uncovered yet, triterpenes specific for camellia oil likely characterize camellia oil as a good material in cosmetics, which are *seco*-triterpenes, camelliol A, B, sasanquol, *etc.* Biosynthesis of these *seco*-triterpenes was unknown. Recent study on *Arabidopsis thaliana* oxidosqualene cyclase (OSC), however, revealed that *seco*-triterpenes are directly biosynthesized by OSC. In order to clarify the biosynthesis of triterpenes in *Camellia japonica*, cDNA cloning of OSC from seeds of *C. japonica* was carried out by homology-based PCR in this study. Presence of eleven OSC homologues (named as cj-01, -02, ---- and -11) was revealed by analysis of the sequence of core DNA fragments. Sequences of three full-length OSCs (cj-01, 08, 11) were obtained by RACE, although none of the other eight OSCs was unfortunately obtained. Three full-length OSCs (cj-01, 08, 11) were obtained by PCR, and ligated into yeast expression vector pYES2. Resulting expression vectors were transferred into *ERG7* (lanosterol synthase gene) deficient yeast strain GIL77. After cell lysis and extraction with hexane, extracts were subjected to GC-MS analysis, which revealed that extract from cj-01 transformant contained β -amyrin as a sole product, that of cj-08 α -amyrin and β -amyrin, and that of cj-11 also α -amyrin and β -amyrin. Minor products by these three transformants were extensively surveyed, but no trace of camelliol A, B and sasanquol was detected. From these result, it is concluded that none of the obtained OSCs (cj-01, 08, 11) in this study was involved in the biosynthesis of camelliol A, B and sasanquol.