

Production of asiaticoside and madecassoside in *Centella asiatica* in vitro and in vivo

ABSTRACT

The localization was determined of the triterpenoids, asiaticoside and madecassoside, in different organs of glasshousegrown plants and cultured material, including transformed roots, of two phenotypes of *Centella asiatica* (L.) Urban of Malaysian origin. Methanolic extracts of asiaticoside and madecassoside were prepared for gradient HPLC analysis. The two phenotypes of *C. asiatica* exhibited differences in terpenoid content that were tissue specific and varied between glasshouse-grown plants and tissue culture-derived material. Terpenoid content was highest in leaves, with asiaticoside (0.79 ± 0.03 and 1.15 ± 0.10 % of dry mass) and madecassoside [0.97 ± 0.06 and 1.65 ± 0.01 %(d.m.)] in the fringed (F) and smooth leaf (S) phenotypes, respectively. Roots of the F-phenotype contained the lowest content of asiaticoside [0.12 ± 0.01 %(d.m.)], whereas petioles of S-phenotype plants contained the lowest content of asiaticoside [0.16 ± 0.01 %(d.m.)] and madecassoside [0.18 ± 0.14 %(d.m.)]. Transformed roots were induced using *Agrobacterium rhizogens* and their growth was maximal on Murashige and Skoog basal medium supplemented with 60 g dm⁻³ sucrose. However, asiaticoside and madecassoside were undetectable in transformed roots and undifferentiated callus.