

Chemical composition of hexane-extracted *Plectranthus amboinicus* leaf essential oil: Maximizing contents on harvested plant materials

ABSTRACT

Plectranthus amboinicus (Lour.) Spreng, also known locally as "Bangun-bangun", is an aromatic medicinal herb known for its therapeutic and nutritional properties attributed to its terpenoid-rich phytochemicals. Information to assist in initiating appropriate harvesting time to maximize the yield of targeted chemicals in harvested plant tissues remains an issue that is seldom highlighted. This study reports on the essential oil distribution in *P. amboinicus* leaves, and total phenolic and flavonoid contents, in addition to GC-MS analysis of hexane extracts of the leaf samples collected at various times throughout the day. The influence of environmental factors on γ -terpinene, p-cymene, carvacrol, and thymoquinone are also discussed. Oil Red O staining showed the highest oil deposition at 2 p.m., which was consistent with the phenolic and flavonoid contents of this plant. GC-MS analysis of the leaf extract showed carvacrol (47.00–60.00%), γ -terpinene (8.00–10.00%), caryophyllene (~6.00%), p-cymene (4.90–6.50%), trans- α -bergamotene (4.70–5.00%), and thymoquinone (3.30–5.60%) were the major components of this plant. Interestingly, thymoquinone, a phytochemical associated with *Nigella sativa*, was also detected in this hexane-extracted sample with maximum accumulation during midday and a decrease at night, which could be due to the lower temperature and dimmer light conditions. The chemical polymorphism in the oil content indicated that environmental factors such as light exposure and temperature should be considered during harvesting to ensure consistent quality of the phytochemicals extracted from the plant materials. This study indicates that oversight in selecting plant materials might compromise the yield of quality phytochemicals extracted from harvested tissues.