

Alterations in herbage yield, antioxidant activities, phytochemical contents, and bioactive compounds of Sabah Snake Grass (*Clinacanthus Nutans* L.) with regards to harvesting age and harvesting frequency

ABSTRACT

Sabah snake grass or *Clinacanthus nutans* has drawn public interest having significant economic benefits attributable to the presence of phytochemicals and several interesting bioactive constituents that may differ according to harvesting age and harvesting frequency. The current study was aimed to evaluate the effect of harvesting age and harvesting frequency towards herbal yield, antioxidant activities, phytochemicals synthesis, and bioactive compounds of *C. nutans*. A factorial randomized completely block design with five replications was used to illustrate the relationship between herbal yield, DPPH (2, 2-diphenyl-1-picrylhydrazyl) and ferric reducing antioxidant power (FRAP) assays, total phenolic and flavonoid content affected by harvesting age (week 8, 12, and 16 after transplanting), and harvesting frequency (harvest 1, 2, and 3). The bioactive compounds by HPLC were also determined to describe the interaction effect between both harvesting age and harvesting frequency. The yield, antioxidant activities, and phytochemical contents were gradually increased as the plant grew, with the highest recorded during week 16. However, the synthesis and activities of phytochemicals were reduced in subsequent harvests despite the increment of the herbal yield. All bioactive compounds were found to be influenced insignificantly and significantly by harvesting age and harvesting frequency, respectively, specifically to shaftoside, iso-orientin, and orientin. Among all constituents, shaftoside was the main compound at various harvesting ages and harvesting frequencies. These results indicated that harvesting at week 16 with 1st harvest frequency might enhance the yield while sustaining the high synthesis of polyphenols and antioxidant activities of *C. nutans*.

Keyword: Herbage yield; Antioxidant; Flavonoid; Phenolic; c-glycosyl flavone; Harvesting age; Harvesting frequency