Effects of Fertilizer Application and Successive Harvesting on Clipping Yield, Phytochemical Contents and Antioxidant Activity of Cynodon dactylon (L.) Pers.

Abstract

The present study aimed to investigate the effects of fertilizer application and successive harvesting on phytochemical contents and antioxidant activities of Cynodon dactylon, a medicinal Bermuda grass in Sabah (Malaysia). Three fertilizers of two nitrogen concentrations were used in the experiment. The grass was harvested successively three times at five-weeks interval. Grass treated with 25 kg N/ha/month from the first harvest was found to have the highest clipping yield. Successive harvesting decreased the dry matter production of the grass irrespective of N concentration applied. Total saponin and alkaloid contents of the grass were increased by a combination treatment of fertilizer type ´ rate ´ harvesting; total flavonoid content was increased by fertilizer type ´ harvesting treatments; however, total phenolic content was not affected by any of the treatment or combination of the treatments. Both of the antioxidant assays (DPPH and FRAP) indicated that antioxidant activity of the grass was increased by fertilizer rate ´ harvesting treatments. There was a significant correlation found between total phenolic and flavonoid contents and antioxidant activities, suggesting that these two secondary metabolites may contribute to the antioxidant property of the grass. Overall, the obtained data indicated that the described treatments could be used to manipulate the production and accumulation of bioactive compounds of C. dactylon.