

Growth and phenolic constituents' production in roselle (*Hibiscus sabdariffa* var. ukmr-2) as influenced by irrigation treatment

ABSTRACT

This study was carried out to investigate the influence of irrigation on the growth and phenolic content production of *Hibiscus sabdariffa* var. UKMR-2. The greenhouse cultivation for UKMR-2 was done under control condition using two different irrigation treatments; Water Treatment 1 (WT1) with 1.72 L/plant/day and Water Treatment 2 (WT2) with 0.86 L/plant/day. Roselle calyces were harvested at selected maturation stage and extracted with water via sonication (50 °C, 30 mins). Analysis of total phenolic, anthocyanin content and antioxidant activity using 2,2-diphenyl-1-picrylhydrazyl free radical scavenging activity (DPPH) assay was performed using water extract of roselle calyces. The growth parameters such as plant height, stem diameter, number of branches and leaves were also recorded. The result showed the mean value for WT1 and WT2 treatment respectively: total phenolic content (TPC) were 2.54 ± 0.34 and 2.47 ± 0.34 mg gallic acid equivalent (GAE)/g DW; total anthocyanin content (TAC) were 8.06 ± 1.10 and 7.64 ± 1.38 mg cyanidin-3-glucoside /g DW; IC_{50} value were 0.28 ± 0.50 and 0.30 ± 0.61 mg/mL. WT1 treated plants growth and percentage yield tended to be more higher compared with WT2 treatments. However, there are no significant differences ($p > 0.05$) recorded on the growth parameter with different irrigation treatment. The results also showed that different irrigation treatment have no significant influence on the TAC, TPC and antioxidant activity ($p > 0.05$). All data showed higher quality on growth and calyx's productivity (including higher concentrations of phenolic contents and antioxidant activity) in UKMR-2 from WT1. Therefore, WT1 (1.72 L/plant/day) is recommended option for roselle cultivation to produce higher phenolic contents, without negative effect on the growth and quality of roselle calyces.