215/B

Investigation of optimum harvesting stage of *Withania somnifera* (L.) Dunal. in terms of phenolic content and antioxidant capacity of different parts of the plant

I D N S Fernando[1], D C Abeysinghe[1] and R M Dharmadasa[2]*
[1]*Department of Plantation Management, Faculty of Agriculture and Plantation Management, Wayamba University of Sri Lanka, Makandura, Gonawila*
[2]*Herbal Technology Section, Industrial Technology Institute, Bauddhaloka Mawatha, Colombo 07*

Withania somnifera (L.) Dunal (Family: Solanaceae) is a therapeutically important medicinal herb widely used in Ayurvedic and traditional systems of medicine in Sri Lanka. In the present study, attempts were made to investigate the optimum harvesting stage of *W. somnifera* in terms of Total Phenolic Content (TPC) and Total Antioxidant Capacity (TAC) of different parts (leaves, stems, roots, flowers and fruits) of 3 different growth stages (just before flowering, just after flowering and fully matured stage) grown with 3 different spacing levels (60 cm × 30 cm, 60 cm × 45 cm and 60 cm × 60 cm). The TAC of leaf extracts of *W. somnifera* at all 3 different growth stages were significantly higher ($P < 0.05$) compared to all other parts of the plant. Out of the 3 maturity stages tested the highest TAC of leaf extract for all three spacing levels (19.86 ± 1.13, 27.21 ± 1.55, 29.53 ± 1.27 mg TE/g DW) was observed at just after the flowering stage and slight reduction was observed at the fully matured stage (19.66 ± 2.04, 22.64 ± 2.25, 21.23 ± 0.99 mg TE/g DW). Leaf extracts of just after flowering stage exhibited significantly higher TPC ($P < 0.05$) followed by fully matured stage and just before flowering stage. The order of total phenol content was leaf > flower > fruit > stem > root. Presences of higher TPC and TAC in just after flowering stage scientifically validate traditional claims of harvesting of *W. somnifera* after the flowering stage. Based on the results 60 cm × 60 cm spacing could be recommended for commercial cultivation of *W. somnifera.* The higher TPC and TAC in leaf at all three stages demonstrated the value of the leaf for the development of newer effective drugs instead of roots and this creates an avenue for use of leaves in addition to roots.

Keywords: Antioxidant capacity, growth stages, solanaceae, total phenolic content, *Withania somnifera*

dharma@iti.lk Tel: 071-8573260