

Comparison of Antioxidant Potential of Sri Lankan and Indian Pomegranate (*Punica granatum* L.) Cultivars

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Antioxidants, especially polyphenols, help to protect the body against oxidative stress by neutralising free radicals, reactive oxygen species (ROS) and reactive nitrogen species (RNS). The present study was carried out to determine the total phenolic content and antioxidant potential of extracts obtained from the aril of Sri Lankan pomegranate (*Punica granatum* L.) varieties (*Nayana*, *Daya*, *Nimali*) and an Indian variety. Well-ripened pomegranate fruits were obtained in August 2010 from the Regional Research Station, Department of Agriculture, Mankandura. Pomegranate juice was extracted by pressing the arils manually and filtering through Whatman No. 1 filter papers to remove particulate matter. The clear liquid devoid of particulate matter was used for analysis. Total Phenolic Content (TPC) was determined using Folin Ciocalteu colorimetric method and expressed as milligram of gallic acid equivalents (GAE) per gram extract. Antioxidant potential of the fruit extracts was assessed using 2,2-diphenyl-1-picrylhydrazyl (DPPH). Total Antioxidant Capacity (TAC) was determined using 2,2'-azinobis 3-ethylbenzothiazoline-6 sulphonic acid (ABTS) radical. DPPH radical scavenging capacity was expressed as IC₅₀ value while TAC was expressed as percentage inhibition after lapse of 1 min. of the reaction.

TPC of pomegranate varieties tested ranged from 0.015 to 0.164 mg GAE/g of extract. *Daya* variety possessed the highest TPC followed by *Nayana*, *Nimali*, and the Indian variety. The IC₅₀ value of pomegranate extracts tested ranged from 0.182 mg/ml to 0.446 mg/ml with *Nayana* variety showing the highest antioxidant activity followed by the Indian variety, *Nimali* and *Daya*. Total Antioxidant Capacity (TAC) of pomegranate varieties tested varied from 72.73 - 93.1% with the highest being observed in *Nayana* variety. The TAC of varieties *Nayana*, *Nimali*, Indian, *Daya* were 93.1%, 91.2%, 89.7% and 72.73%, respectively, at the 0.1g/ml concentration. Despite the moderate TPC, *Nayana* variety showed the highest antioxidant activity as measured by DPPH scavenging activity (IC₅₀ value 0.182 mg/ml) and the highest TAC (93.1% inhibition). On the other hand, *Daya* variety showed a relatively less antioxidant activity though it contained high level of TPC. The TPC and antioxidant activity as measured by TAC and IC₅₀ value were not well correlated ($R^2 = 0.545$ and 0.465 , respectively). The poor correlation may be attributable to differential behaviour of phenolic constituents.

Fruits with IC₅₀ value of less than 1 mg/ml are categorised as extremely high antioxidant potential fruits. Based on TAC and DPPH radical scavenging activity, pomegranate varieties tested can be categorised as fruits with high antioxidant potential.

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