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Chemical profile of *Terminalia chebula* fruit collected from different regions of Sri Lanka and commercial samples from Sri Lanka and India

K. P. C. D. Suraweera[1,2], S. R. Wickramarachchi[2] and T. M. S. G. Tennakoon[1*]

[1]Link Natural Products (Pvt) Ltd., Sri Lanka
[2]Department of Chemistry, Faculty of Science, University of Kelaniya, Sri Lanka
tennakoon@linknaturalproducts.com*

Terminalia chebula is a valuable medicinal plant used in traditional medicine. The fruit of *T. chebula* contains a large number of biologically active chemical compounds. Demand for the herbal drugs is increasing every day and maintaining the quality of herbal drugs is very important. Therefore, the objective of this study is qualitative and quantitative comparison of the chemical profiles of *T. chebula* fruit (without seeds) of commercial samples and authentic samples. Authentic samples of *T. chebula* were analyzed to see the effect of climatic zone variation on chemical profile and physicochemical parameters. Authentic samples (SL_A) were collected from *T. chebula* plant itself from onsite visit, from Bibila, Buththala, Padhiyathalawa, Gampaha and Colombo and authenticated from the voucher specimen available at Herbarium, Link Natural Products (Pvt) Ltd (LNP). One composite sample was made according to sampling protocol, WHO 1998, from each region for analysis. Commercial samples are a mixture of fruits obtained from several suppliers from different areas. Commercial samples were obtained separately from three different batches of *T. chebula* commercial stocks from Sri Lanka (SL_C) and India (IN_C) at LNP. Powdered dried fruits were extracted with 70% aqueous methanol and concentrated using rotatory evaporator. Physicochemical parameters were determined according to WHO and European pharmacopoeia methods. Total tannin was determined using Folin-Denis assay. Crude *T. chebula* fruit extract was separated by thin layer chromatography (TLC) and high performance liquid chromatography (HPLC). Gallic acid content and gallic acid/ellagic acid ratio were calculated using the peak area of HPLC chromatograms. TLC and HPLC showed a large number of compounds in the crude extract of *T. chebula* fruit. Both showed similar profiles with variations in intensity among the samples. Physicochemical parameters (without water soluble extractive values), total tannin, gallic acid content, gallic acid/ellagic acid ratio are statistically different among SL_A samples ($P < 0.05$). Except physicochemical parameters, other parameters are statistically similar among SL_C and IN_C ($P<0.05$). Total tannin content (% w/w) of SL_A samples was; Padiyathalawa: 33.40 ± 0.17, Buththala: 43.39 ± 0.41, Gampaha: 41.13 ± 0.61, Bibila: 42.31 ± 0.23 and Colombo: 34.12 ± 0.01. Gallic acid content (% w/w) of SL_A samples was; Padiyathalawa: 0.49 ± 0.01, Buththala: 0.98 ± 0.01, Gampaha: 1.03 ± 0.02, Bibila: 0.83 ± 0.02 and Colombo: 1.86 ± 0.04. Gallic acid/ellagic acid ratio (% w/w) of SL_A samples; Padiyathalawa: 0.15 ± 0.0038, Buththala: 0.18 ± 0.0009, Gampaha: 0.16 ± 0.0003, Bibila: 0.16 ± 0.0041 and Colombo: 0.68 ± 0.0040. Total tannin content, gallic acid content and gallic acid/ellagic acid ratio vary in different batches of commercial samples. Mean of total tannin content (% w/w) of SL_C was 49.14 ± 6.09 and IN_C is 42.79 ± 0.76. Mean of gallic acid content (% w/w) of SL_C was 1.13 ± 0.28 and IN_C is 2.25 ± 0.69. Gallic acid/ellagic acid ratio (% w/w) of SL_C was 0.30 ± 0.07 and IN_C is 0.43 ± 0.05. Chemical composition and quality of *T. chebula*. dried fruit depend on the geographical location, maturity stage, growth condition and raw material processing condition.

Keywords: *T.chebula*, Gallic acid, HPLC, TLC