

## Scientific investigation of ayurvedic formulation, “nishadi churnaya” for its antioxidant capacity and activity towards anti glycation pathways

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The ayurvedic formulation “Nishadi churnaya” is a mixture of four plant constituents that are *Curcuma longa*, *Strychnos potatorum*, *Coscinium fenestratum* and *Salaciareticulate*, and has been used in ayurvedic medicine of Sri Lanka to treat diabetes mellitus. This study attempted to investigate the phytochemical profile, antioxidant and antiglycation activities of “churnaya” in order to validate its usage in ayurvedic system for the treatment of diabetes. Aqueous and methanolic extracts of individual plant materials were prepared by Soxhlet method and maceration respectively while aqueous extract of churnaya was prepared by a method similar to traditional “Kasaya” which is a refluxing followed by concentration. Total flavonoids and total phenols contents in aqueous extract of “Nishadi churnaya” were determined using colorimetric methods described in the literature and found as 195.00 mg Quercetin Equivalent /g and 96.21 mg Gallic Acid Equivalent /g respectively. Proximate analysis of raw powder of churnaya showed 32.35% of crude fiber, 44.89% of carbohydrate, 12.23% of moisture, 5.21% of ash and 1.97% of crude fat. The antioxidant capacities of aqueous extracts of churnaya was evaluated using FRAP and DPPH assays using FeSO<sub>4</sub>.7 H<sub>2</sub>O and ascorbic acid as the standards, respectively. “Nishadi churnaya” showed the lowest IC<sub>50</sub> value (182.71 ppm) for DPPH assay and the highest value for FRAP assay which is 992.82 μ mol Fe<sup>2+</sup>/g FRAP equivalents. Antiglycation activity of aqueous extract of plant materials and churnaya was determined using browning measurements. The relative percentage intensity of browning of Glucose/Lysine system, with aqueous extracts of *S. reticulate*, *C.longa*, *C. fenestratum*, *S. potatorum* and churnaya has shown 67.33%, 66.90%, 55.78%, 57.20%, 45.93%, and for fructose system 76.32 %, 59.71%, 60.72%, 73.18 %, 47.68%, respectively. Quantification of carbonyl content of glycated samples was conducted and churnaya showed the lowest relative percentage value of 5.84%. This study reveals that churnaya possesses the highest antioxidant and significant antiglycation activities. Thus it can be concluded that the combination of individual plant constituents, churnaya’ produce their effect in synergistic manner to exert great therapeutic efficiency.

**Key words:** *Nishadi churnaya*, *antiglycation*, *antioxidant*, *phytochemical*, *proximate*

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