Section A

102/A

Tinospora cordifolia Miers (Rasakinda) grown in Sri Lanka: Pharmacognostical, physico-chemical, and phytochemical analysis of the stem of *Tinospora cordifolia*

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Tinospora cordifolia is an important medicinal plant distributed throughout Sri Lanka and commonly known as Rasakinda (Sinhala) and Giloy (English). In Sri Lankan traditional medical system and Ayurveda, it is widely used for treatment of diabetes mellitus, fever, arthritis, skin diseases and for rasayana (rejuvenating) therapies due to its anti-inflammatory, hypoglycaemic, immunomodulatory, anti-oxidant, anti-allergy, antipyretic, anti-arthritic, and various other medicinal properties. Imported *T. cordifolia* (TC) dry stems and Sri Lankan grown TC stems can be found in the Sri Lankan herbal market. There are other varieties of *Tinospora* species known as Tikthakinda, Bukinda and Gatakinda also available in the market under the name of Rasakinda, which leads to adulteration. Hence in this research an attempt was made to develop standards for genuine TC stems grown in Sri Lanka. Stems of TC were collected and studied for macroscopical, microscopical, physico-chemical, phytochemical constituents and TLC fingerprint patterns with berberine marker compound.Microscopically the stem of TC showed wheel shaped appearance at the transverse cut surface. It also showed mucilage cells and abundant starch granules. Percentages of total ash, water soluble ash, acid insoluble ash, water extractable matter and ethanol extractable matter were 9.1 $\pm$ 0.1%, 2.3 $\pm$ 0.1%, <0.1%, 7.0 $\pm$ 0.1% (cold water), 16.2 $\pm$ 0.3% (hot water), 3.7 $\pm$ 0.7% (cold methanol) and 4.0 $\pm$ 0.3% (hot methanol), respectively. Heavy metals such as Pb (0.2 mg/kg), Cd (< 0.05 mg/kg), As (0.05 mg/kg) and Hg (0.06 mg/kg) did not exceed the limits given in WHO guidelines. Phytochemical screening revealed the presence of phenols, saponins, tannins, steroids, flavonoids, terpenoids and cardiac glycosides. The TLC fingerprint of TC was developed and compared with one of its marker compound, berberine. The HPTLC fingerprint pattern of methanolic extract of TC showed the R_f value corresponding to berberine, detected at wavelength 254 nm. In conclusion, the results obtained from this study can be used as a standard for Sri Lankan grown TC stems.

Key words: *Tinospora cordifolia*, Rasakinda, Pharmacognosy, Phytochemicals

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