

Physico-chemical and Phytochemical Parameters of *Rubia Cordifolia* Market Samples found in Sri Lanka

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Introduction

Ayurvedic Pharmacopoeia recorded more than 300 medicinal plants that are commonly used in Ayurvedic system of medicine. The knowledge of chemical compounds present in a plant helps the scientists to understand the mode of action of the drug (Joshi & Sabnis, 1989). It has been observed that there is a wide dissimilarity and variation in clinical results obtained by the use of crude drugs obtained from different geographical regions (Karnick, 1978). *Rubia cordifolia* (Family: Rubiaceae); is a common medicinal plant and an essential raw ingredient for the Ayurvedic herbal formulations such as Manjishthadi kvatha (Lnghumanjishthadi and Mahamanjishthadi), Pinda taila, Vipadikahara grita taila, Aswagandharistam, Arvindasava, Chandanasava, Ushirasava, Jaatyaadi ghrita, Manjishthadi taila, Khadiradi gutika, according to Ayurvedic basic texts and also in traditional preparations.

R. cordifolia is commonly named as 'Indian Madder' and sold under the trade name 'Manjishta'. It is a straggling perennial with very long cylindrical, flexuose roots with a red cortex and very long flexible, tough, white barked cylindrical stem. Stems often many yards long, rough, grooved, becoming slightly woody at the base (Kirtikar & Basu 1975, Jayaweera, 2006).

The plant is used both externally as well as internally. The roots of Manjishta are used for medicinal purposes. Externally, Manjishta is highly recommended in skin diseases associated with oedema and oozing. Especially, chronic skin diseases, wounds respond very well for Manjishta kvata and grita. The root is sweet, bitter, acrid, heating, alexiteric, antidysenteric, antipyretic, analgesic, anthelmintic, improves the voice and the complexion

and cures inflammation, leucoderma, erysipelas, ulcers (Kirtikar & Basu, 1975).

The propagation of *R. cordifolia* is not sufficient for the demand for drug manufacturing processes in Sri Lanka and almost depends on the imported material. However, no scientifically controlled studies were conducted to check the quality control parameters of *R. cordifolia* imported samples. Therefore, present study was conducted to establish quality control parameters of *R. cordifolia* market samples found in Sri Lanka by a). physico-chemical evaluation b). screening of major phytochemical classes and c). development of Thin Layer Chromatography fingerprints.

Methodology

Plant Material

R. cordifolia market samples were collected from three locations of Western province, Sri Lanka. Plant materials were identified and authenticated by Head of the Department, Department of Materia Medica, Institute of Indigenous Medicine, University of Colombo, Rajagiriya, Sri Lanka. Samples were washed, shade dried, crushed and powdered by using a domestic grinder. All samples were kept in air tight containers until used.

Preparation of Extracts Using Rubia Cordifolia for Physico-Chemical Evaluation

Physico-chemical parameters : moisture content, extractable matter (hot and cold water, hot and cold ethanol), total ash content, acid-insoluble ash content, and water-soluble ash content were calculated according to methods described in guide lines of WHO (2000).

Preparation of Extracts Using Rubia Cordifolia for Screening Of Phytochemical Compounds

Phytochemical analysis were performed for water extracts and ethanolic extracts (cold and hot) for samples according to the method described by Fansworth (1996) to find the presence or absence of phenolic compounds, flavanoids, steroid glycosides, tannins, coumarins, alkaloids and saponins.

Development of Thin Layer Chromatography (TLC) Fingerprints for Rubia Cordifolia

Methanol (50 ml) was added to 4.0 g of the sample and stirred well for 30 min. Then filtered through a funnel and evaporated the filtrate using a rotovapour (Buchi, B-480) and then re-dissolved the residue in 20 mL methanol. Each extract (2 and 4 μ L) was spotted on TLC plates.

Absorbent : Silica gel-GF₂₅₄
 Solvent system : Ethyl acetate: Dichloromethane: Cyclohexane
 (0.5:3.5:1 v/v/v).

Detection

Direct visualization : Vanillin – sulphuric acid reagent was sprayed to the TLC plate and heated at 105 °C for 5 min.

Scanning : Densitometer (CS – 9301PC, Shimadzu, Japan at 254 nm (before spraying)

Key findings

Table 1: Physico-Chemical Parameters of *Rubia Cordifolia* Market Samples Found in Sri Lanka

Physico-Chemical Parameters	Amount (%) (Dry Wt Basis)
Moisture content	10.62 \pm 0.06
Hot water extractable matter	15.55 \pm 0.51
Hot ethanol extractable matter	6.23 \pm 0.05
Cold water extractable matter	9.66 \pm 0.11
Cold ethanol extractable matter	2.34 \pm 0.0
Total ash content	6.63 \pm 0.16
Acid-insoluble ash content	0.71 \pm 0.07

Water-soluble ash content	2.93 ± 0.02
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The results of the physico-chemical and phytochemical studies are tabulated in Table 1 and 2. The results obtained in the present study for the ash values were comparable with that of Devi Priya and Siril (2013).

Table 2: Phytochemical Classes of *Rubia Cordifolia* Market Samples Found in Sri Lanka

Phytochemical Classes	Presence or Absence of Phytochemical Classes			
	(HWE)	(HEE)	(CWE)	(CEE)
Phenolic Compounds	√	√	√	√
Saponins	√	√	√	-
Flavanoids	√	√	√	-
Steroid Glycosides	√	√	√	√
Tannins	√	√	√	√
Coumarin	√	√	√	√
Alkaloids	√	√	-	-

Conclusion

Present study helps to establish quality control parameters for *R. cordifolia* market samples found in Sri Lanka

Keywords: Physico-Chemical; Phytochemical; *Rubia Cordifolia*; Thin Layer Chromatography;

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