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Phytochemical and Pharmacognostical Investigation of *Dolichandrone arcuata* (Wight) Clarke

Bojaxa A Rosy* and L.Henry Joseph
Department of Plant Biology and Biotechnology
St.Xavier's College, (Autonomous), Palayamkottai – 627 002, Tamil Nadu.
*bojaxarosy@yahoo.com
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Abstract

Phytochemical and pharmacognostic analysis were carried out on the herb, *Dolichandrone arcuata* (Wight) Clarke. The phytochemical screening revealed the presence of reducing sugar, phenol, steroid, triterpeniod, flavone, catachin, anthraquinone, tannin and saponin, while amino acid and proteins are absent. The pharmacognostic analysis revealed sulphated ash of 11.50 % for leaf and 9.5% for stem, total ash value of 9%for leaf and 7.5% for stem, water soluble ash value of 3% for leaf and 2.5% for stem, acid insoluble ash value of 1.5% for leaf and 2.5% for stem.
Key words: *Dolichandrone arcuata*, Phytochemicals, Pharmacognostic analysis.

Introduction

Herbal plants are an important source of new chemical substances with potential therapeutic uses (Alam *et al*.,2010). Approximately 119 pure chemical substances extracted from higher plants are used in medicine throughout the world (Famsworth *et al*., 1985). *Swertia chirata* (Family*: Gentianaceae*) is well known for its different therapeutic uses. The plant have been reported to have anti-inflammatory (Islam *et al*., 1995), anti-viral (Verma *et al*., 2008), anthelmintic (Iqbal *et al*., 2006), anticarcinogenic (Saha *et al*., 2004), hepatoprotectative (Mukherjee *et al*., 2006), hypoglycemic (Bajpai *et al*., 1991 and Saxena *et al*., 1993) activities. Early studies documented the presence of flavonoids, xanthones, terpenoids, iridoids, and secoiridoid glycosides in the *Swertia chirata* plant (Pant *et al*., 2000). *Dolichandrone arcuata* (Wight) Clarke, is a large evergreen tree of the family Bignoniaceae, Which is distributed in the Southern Western Ghats, Tamil Nadu. Flowering and fruiting throughout the year, but increased during the month of February. Taxanomical description of this plant is compound leaf; leaflets usually 5 or 7. Sometimes up to 11; Ovate or orbicular; obtuse or with a short point; nerves about 5-6 pairs; petiole's 1-3 in. long; that of end leaflet longer. Early reports are bioassay investigated in this species (Rosy and Hendry, 2010). The present study has been phytochemical analysis and pharmacognostical standards of *D. arcuata.*

Materials and Method

The plant *Dolichandrone arcuata* was collected from Singikulum village in Tirunelveli district and identified with the help of flora of madras presidency (Gamble, 1928)

Plant Preparation

The fresh leaf and stem of plant was rinsed with water to remove sand was air-dried for one month at room temperature. It was pulverized to reduce the surface area using wooden mortar and pestle. The pulverized sample was kept in air-tight cellophane bags until use.

Preliminary phytochemical screening was carried out following (Brindha *et al.,* 1981). The pharmacognostical studies were obtained by employing standard of analysis as described in (Pharmacopoeia of India,1996).

Results and Discussion

The phytochemical screening carried out on *Dolichandrone arcuata* reveals the presence of reducing sugar, phenol, steroid, triterpeniod, flavone, catachin, anthraquinone, tannin and saponin, while proteins and amino acids were not detected. The presence of some of these secondary metabolites suggests that the plant might be of medicinal importance and supports the bases for some of the ethno-uses. For instance, the presence of flavonoids suggest that the plant might have an anti-oxidant, anti-allergic, anti-inflammatory, anti- microbial, anti-cancer activity (Kunle and Egharevba, 2009) It also suggests that the plant might have diuretic properties (Jayvir *et al*., 2002).

The presence of tannins shows that the plant is astringent as documented and suggests that it might have anti-viral and anti-bacterial activities and can aid in wound healing and burns (Haslem, 1989; Favel *et al*., 1994.). Saponins and

glycoside are also very important classes of secondary metabolites as some are cardio-active and used in treatment of heart conditions (Oloyode, 2005). Some researchers have also reported that some saponins have anti-cancer and immune-modulatory properties (Kunle and Egharevba, 2009; Evan, 2002). Volatile oils are used in the industries for various purposes, both as a pharmaceutical/cosmetic raw material for production of emollients and demulcents as well as active ingredient for the respiratory tract infections. They are also used as flavoring agents, in aromatherapy, perfumery etc. Examples are eucalyptus oil, lemon oil and peppermint.

Table -1: Preliminary Phytochemical Screening of *Dolichandrone arcuata* (Wight) Clarke.

Sl. No	Solvent	Plant part	Reducing sugar	Protein	Phenol	Alkaloid	Steroid	Tri terpenoid	Flavone	Cathacin	Anthroquinone	Tannin	Amino acid	Saponin
1	Petroleum ether	Leaf	-	-	+	-	-	-	-	-	-	-	-	-
		Stem	-		-	-	+	-	-	-	-	-	-	+
2	Benzene	Leaf	-	-	-	-	-	-	-	-	+	-	-	-
		Stem	-	-	-	-		-		-	-	-	-	+
3	Chloroform	Leaf	+	-	-	-	-	-	-	-	-	-	-	+
		Stem	+	-	-	-	-	+	+	-	-	-	-	-
4	Methanol	Leaf	-	-	-	-	-	-	-	-	-	+	-	-
		Stem	+	-	+	-	+	+	+	-	-	+	-	-
5	Distilled water	Leaf	+	-	-	-	-	+	+	+	+	+	-	-
		Stem	+	-	-	-	-	+	+	+	-	+	-	-

Present (+) Absent (-)

The proximate analysis showed sulphated ash of 11.50 % for leaf and 9.5% for stem, total ash value of 9%for leaf and 7.5% for stem, water soluble ash value of 3% for leaf and 2.5% for stem which is lower than the alcohol soluble extractive value of 5.99% is suggest that water is a better solvent of extraction than alcohol, acid insoluble ash value of 1.5% for leaf and 2.5% for stem. The low acid-insoluble ash of 1.5% for leaf and 2.5% for stem. implies that a large portion of the ash content is acid soluble and hence may be physiologically important as salts in the body when consumed. It is also indicative of high digestibility of the plant when eaten.

Table-2: Physico Chemical Characters of *Dolichandrone arcuata* (Wight) Clarke.

Sl. No	Parameter	Percentage (w/w)	
		Leaf	Stem
1	Total ash	9	7.5
2	Sulphated ash	11.5	9.5
3	Water soluble ash	3	2.5
4	Acid soluble ash	1.5	2.5

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