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Pharmacognostical and Preliminary Phytochemical Studies of *Argyreia nervosa* (Burm. *f*.) Bojer

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ABSTRACT

Pharmacognostical parameters for the leaves of *Argyreia nervosa* (Burm. *f*.) Bojer were studied with the aim of drawing the pharmacopoeial standards for this species. Macroscopical and microscopical characters, physio-chemical constants, quantitative microscopy parameters, extractive values with different solvents, fluorescence analysis of dry powder, its reaction after treatment with chemical reagents under visible light and UVlight at 254 nm and 366 nm. Preliminary phyto chemical screening on the leaves of *Argyreia nervosa* (Burm. *f*.) Bojer were studied .The determination of these characters will help future researchers in their Phytochemical as well as Pharmacological analyses of this species.

Keywords: *Argyreia nervosa*, Convolvulaceae, pharmacognostic, phytochemical.

INTRODUCTION

Argyreia nervosa (Burm. *f*.) Bojer (Convolvulaceae) is a climbing shrub with woody tomentose stem,found mainly in Deccan,Karntaka and East slopes of the West Ghats at an altitude of 900m[1]. It is commonly known as Elephant creeper and in Samudra- sok Hindi[2].Traditinally leaves used by Rajasthani tribes to prevent conception[3]. Seeds of *Argyreia nervosa* found to possess hypotension,spamolytic [4], and anti-inflammatory activity[5]. Chemical analysis revealed the presence of triterpenoids,flavanoids,steroids and lipids[6]. Roots of *Argyreia nervosa* proved the immunomodulatory activity against the myelosuppressive effects induced by Cyclophosphamide[7]. 24R-ergost-5- en-11-oxo-3 beta-ol alpha –D glucopyranoside xylose was isolated from seeds of *Argyreia nervosa* known as Argyreioside [8].

Table 1. Ethnomedical information of *Argyreia nervosa* Burm[9].

Parts	**Uses**
Root	Appetitiser,anaemia,aphrodisiac,anti–inflammatory,brain-tonic,cardiotonic,cerebral disorders, diabetes,expectorant,obesity,syphilius, tuberculosis , ulcers and wounds.
Stem bark	No report available
Fruit	No report available
Seed	No report available
Leaves	Prevents conception, antiphlogistic
Flowers	No report available

But no pharmacognostical work has been done so far. Therefore, an attempt has been made to study the Pharmacognostic parameters on the leaves of *Argyreia nervosa* in both whole form and powdered form.

Table 2. Macroscopy of *Argyreia nervosa* (Burm. *f*.) Bojer.

Parts	**Observation**
Bark	Woody tomentose
Flowers	pink
Fruit	Fresh /globular
Seed	Black
Leaves	15-22 cm.
Appearance	Silky & tomentose /glabrous beneath
Shape	Cordate
Length/height	7. 5 -18 by 2.5-10 cm.
Apex/base	Acute /cordate.
Petiole	petioled
Surface	Glabrous
Arrangement	alternate
Venation	Reticulately Pinnate

Materials and Methods

Plant material

The plant material was collected from the foothills of Tirumlahills, Tiruapthi.A.P.in the month June 2007.The plant was identified and authenticated by Dr.Madhav Shetty, Taxnomist,Dept of Botany, S.V. University, Tiruapthi. A herbarium was preserved in the department for further reference. The leaves were separated, dried, coarsely powdered passed through sieve no 40 and stored in a closed container for further use. All reagents used were of analytical grade obtained from S.D. Fine Chemicals Ltd., Mumbai.

Methods

The macroscopical characters (size, shape colour, odour, texture, venation margin, base, apex and petiole) of the leaves were observed[10]. Then, anatomical study, powder was identified with routine reagents to study the lignified cells, trichomes, stomata, fibres etc. Quantitative microscopy was determined by methods prescribed by Trease and Evans[11].

The ash values, extractive values with various reagents and were determined as per the Indian Pharmacopoeia[12]. The behaviour of powdered leaves with various chemical reagents was studied [13,14]. The fluoroscence characters of the powder with various acids were observed under visible light and UV light as per the proceduere[15.] Measurement of vein islet number, vein termination number, stomatal number, stomatal index and length of trichome were determined. Extractive values were performed with various solvents like petroleum ether, chloroform, ethyl acetate, alcohol and water was performed as per Ayurvedic Pharmacopoeia[16]. Prelimnary phytochemical tests of the powder/extracts were performed using specific reagents through standard procedures[17].

Results

Analysis and Discussion

Colour -green, odour - odourless, taste – slightly bitter , size 15-22cm in length, cordate in shape, tomentose-surface, acute-apex, base-cordate, entire-margin, paripinnate venation and petioled . The physical constants such as total ash value (4.3 %) acid insoluble ash (1.6%) water soluble ash (3.94%) which are specific identification for this species. The soluble extractive values respectively, which indicates the nature of constituents present. Quantitative microscopical study also give valuable information regarding specific leaf constants such as vein islet(10.2/mm^2),vein termination number(12.6/$mm^{2)}$ stomatal number(4.5/mm^2 and 16 /mm^2) upper and lower epidermis respectively.

Length of trichome(12.98µ--59.38 µ--101.9µ) The behaviour of leaf powder upon treatment with different chemical reagents was also observed and reported in Table 6. Fluoroscence studies of powder with various reagents revealed the presence of green & orange fluoroscence with Conc. sulphuric acid and glacial acetic acid respectively under UV light at 254 nm and 366 nm. The powder microscopy revealed the presence of glandular &covering trichomes, xylem fibres, epidermal cells, cork cells, vessels with bordered pits,,xylem vessels with spiral thickenings were recorded.

Powder analysis of *Argyreia nervosa* Burm .

It is a pale green, fine, odourless powder with slight bitter taste. The powder microscopy revealed the presence of glandular &covering trichomes, xylem fibres, epidermal cells, cork cells, vessels with bordered pits,xylem vessels with spiral thickenings were recorded. The various qualitative chemical tests (Table 7) have shown the presence of triterpenoids, saponins, sterols, flavanoids, carbohydrates phenols, tannins and in large amount whereas aromatic acids, gums and mucilage and volatile oils were totally absent in the leaf extract of this plant.

Table 3. Determination of Ash Values of *Argyreia nervosa*.

S. No.	Ash type	Percentage of Ash
1.	Total ash	4.3% w/w
2.	Acid insoluble ash	1.6% w/w
3.	Water soluble ash	3.94% w/w

Table 4. Determination of Extractive Values *of Argyreia nervosa.*

S. No.	Solvent	Percentage of extractive
1.	Petroleum ether	3.16% w/w
2.	Chlororform	0.8% w/w
3.	Ethyl acetate	1.4% w/w
4.	Ethanol	0.2% w/w
5.	Water	7.6% w/w

Table 5. Determination of phyto constants of *Argyreia nervosa.*

Leaf constants	Report
Vein islet number	10.2/mm^2

Vein termination number	12.6/mm^2
Stomatal index (upper epidermis)	4.5/mm^2
Stomatal index (lower epidermis)	16/mm^2

Similarly the fluroscence characterstic of the leaf powdered leaf, when treated with various chemical reagents and its extracts have also been extensively studied. The extractive values of the powder with different solvent was determined and its result was reported in table no: The various qualitative chemical tests have shown the presence of sterols, flavanoids, phenols, tannins and saponins in large amount whereas aromatic acids, carbohydrates, triterpenoids gums and mucilage and volatile oils were totally absent in the leaf extract of this plant.

Powder as such :

Colour : Dark green.

Taste: Slightly bitter.

Odour: Characteristic .

Table 6. Behavioural characterstics of powdered leaves of *Argyreia nervosa* with different chemical reagents.

S. No.	Particulars	Under Visible light	U.V. light	
			Short wavelength	Long wavelength
1.	Powder as such	Dull green	Dark green	-----
2.	Powdered drug + Conc. HCl	Dull green	Pale green	-----
3.	Powdered drug + Conc. H_2SO_4	Dull green	Pale green	Green
4.	Powdered drug+ Conc. HNO_3	Yellow	Dull green	-----
5.	Powdered drug+ Glacial Acetic acid	Dull green	Pale green	Orange
6.	Powdered drug+ Aqueous NaOH	Dark green	Dark green	-----
7.	Powdered drug + NaOH (Alcoholic)	Dark green	Dark green	-----
8	Powdered drug + 10%Hcl	Dull green	Dull brown	-----

9.	**Powdered drug + 10% H_2SO_4**	**Dull brown**	-----	-----
10.	**Powdered drug + 10% HNO_3**	**Dull green**	**Dark green**	-----
11.	**Powdered drug + 10% Glacial Acetic acid**	**Dark green**	**Dark green**	-----
12.	**Powdered drug + Ferric chloride(Aqueous)**	**Dark green**	**Dark green**	-----
13.	**Powdered drug + Ferric chloride(Alcoholic)**	**Dark green**	**Dark green**	-----

Table 7. Preliminary phytochemical screening of *Argyreia nervosa*.

S. No.	Tests	Powder + Water	Ethanol extract	Water extract
1.	**Alkaloids:**			
	Dragendroff's test	+ ve	+ ve	+ ve
	Mayer's test	+ ve	+ ve	+ ve
	Hager's test	+ ve	+ ve	+ ve
	Wagner's test	+ ve	+ ve	+ ve
2.	**Carbohydrates:**			
	Fehling's test	+ ve	+ ve	+ ve
	Molish test	+ ve	+ ve	+ ve
3.	**Gums/Mucilage**			
	Water	-ve	- ve	- ve
	Alcohol	-ve	- ve	- ve
4.	**Tannins:**			
	Aq. $FeCl_3$ Test	+ ve	+ ve	+ ve
	Alc. $FeCl_3$ Test	+ ve	+ ve	+ ve
5.	**Flavonoids:**			
	Lead acetate test			
	Shinoda test	+ ve	- ve	+ ve
	Mg/Hcl	+ ve	- ve	+ve
		+ ve	- ve	+ ve
6.	**Saponins:**			
	Foam Test	+ ve	+ ve	- ve

	Lead acetate test	+ ve	+ ve	+ ve
7.	**Sterols:**			
	Salowaski test	+ ve	+ ve	+ ve
	Libberman Burchad test	+ ve	+ ve	+ ve

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