

Preliminary Phytochemical Evaluation of Leaves Extracts of *Asparagus Racemosus* Willd.

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ABSTRACT

Asparagus racemosus Willd, is commonly known as Shatavari, means "she who possesses a hundred husbands" belongs to family *Liliaceae*; has been used as a medicine since centuries. The present study deals with Pharmacognostical evaluation including examination of morphological, determination of quality control parameters such as ash value, extractive value and loss on drying were carried out. The preliminary phytochemical screening of various leaf extracts like petroleum ether, methanol, chloroform, acetone, ethyl acetate and water was also carried out and phytochemical screening showed the presence of various phytoconstituents like alkaloids, anthroquinone, glycosides, carbohydrates, flavonoids, protein and amino acids, tannins, phytosterols and saponins. The result of this study can be useful in setting some diagnostic indices for the identification and the preparation of the monographs of the medicinal plants.

Keywords: *Asparagus racemosus*, extraction, phytochemical screening,

INTRODUCTION

Asparagus racemosus Willd. (Family: *Liliaceae*) (Madhavan et al., 2010) is an important monocot medicinal plant which is distributed in tropical and subtropical forest and in central parts of India. The leaves are reduced to small scales or needle like spines called cladodes. The plant-based, traditional medicine systems continue to play an essential role in health care, with about 80% of the world's inhabitants relying mainly on traditional medicines for their primary health care. Which are also used to rectify the gynecological problems like irregularities in menstrual cycle and promote milk secretion, as demulscent, diuretic, aphrodisiac and galactagogue (Goyal *et al.*, 2003). This species contains diosgenin, glycosides, sterols and their glycosidese so are very important for the treatment of diarrhoea, dysentery, diabetes, jaundis and other urinary disorders (Ghani, 1998). The herb contains several active constituents which are useful in treating many diseases. It mainly contains steroidal saponins (Hayes *et al.*, 2006 and 2008). Leaves mainly contain rutin, diosgenin and a flavonoid as quercetin 3- glucuronide (Mandal *et al.*, 2006). Thus taking in to the view of this plant, the present investigation is directed to remain some pharmacognostic parameters and phytochemical screening of the leaves for strengthening the traditional knowledge with scientific bases.

MATERIALS AND METHODS

Collection, Authentication and Extraction of Plant Material

The leaves of *Asparagus racemosus* (Family: Liliaceae) were collected in the month of April 2011 from Patan district, Gujarat, India. The plant material were identified and authenticated by a taxonomist Dr. R.S. Patel senior scale lecturer of Maninagar science college Ahmadabad. The collected leaves were washed; shade dried and was pulverized with mechanical pulveriser for size reduction. It was then passed through whattmen filter; the fine powder was collected and stored in air tight container for the preparation of extract.

Pharmacognostic Studies (Khandelwal *et al.*, 1996)

Morphological Studies were carried out by using simple determination technique, the Width of blade, Length of leaf, Characters shape and number of leaves. Powder of leaves treated with various chemical reagents and then observed for change in colour.

Physico-chemical parameters (Indian Pharmacopia, 1996; Khandelwal *et al.*, 1996 and Kokate *et al.*, 2008 and 2009)

The parameter was done to evaluate the percentage of total ash, water soluble, acid insoluble ash; loss on drying were calculated as per Indian Pharmacopoeia The extract of the powdered leaves were prepared with the different solvents like Petroleum ether, Chloroform, Ethyl acetate, Ethanol, Methanol and finally with Aqueous for the study of extractive value. Fluorescence analysis was also carried out for the powder.

Preliminary phytochemical analysis (Kokate *et al.*, 2008 and 2009)

For the Preliminary phyto-chemical analysis, the extract was prepared by weighing 20gm of dried leaf powdered and were subjected to maceration with different solvents like Petroleum ether, Chloroform, Ethyl acetate, Ethanol, Methanol and finally with Aqueous successively in a soxhlet extractor. The presence and absence of the primary and secondary phytoconstituents like Alkaloids (Harborne, 1998; Evans and Trease 2002), Glycosides, Cardiac Glycosides, Saponin, Tannins & Phenolic Compounds, Flavonoids, Anthroquinone, Proteins & Amino Acids, Sterols & Triterpenoids, and Carbohydrates were detected by usual prescribed methods.

RESULT AND DISCUSSION

Morphological studies

The macroscopical examination of the leaves is presented in Table 1.

Table-1 macroscopic characters of asparagus racemosus leaves

Constants	Features
Width of blade	Minute
Length of leaf	5-13 ± 2.0 cm
Characters	Scaly, triangular stiff acuminate reduced to suberect or subcurved spines.
No of leaves	Numerous

Table-2 powdered drug analysis of leaves of asparagus racemosus with different chemical reagents

Reagents	Observation
Powder as such	Greyish white
Powder with acetic acid	Greyish
Powder with conc. sulphuric acid	Brownish black
Powder with conc. nitric acid	Reddish
Powder with conc. hydrochloric acid	Light white
Powder with ferric chloride solution	Brownish black
Powder with 5% iodine solution	Reddish
Powder with antimony trichloride solution	Light brown
Powder with aqueous sodium hydroxide solution (I N)	Yellowish
Powder with picric acid solution	Greenish yellow

Physicochemical Parameters

The leaves powdered were evaluated for its physico-chemical parameters like total Ash values, water soluble ash and Acid insoluble ash; extractive values; loss on drying. All the results are tabulated below in table 3.

Table-3 Physical constant values of asparagus racemosus leaves.

Sr.No.	Parametrs	Values (%)w/w
1	Ash Values	
	Total Ash	12.8
	Water soluble Ash	6.5
	Acid soluble Ash	5.5
2	Extractive Values	
	Petroleum Ether Extractive	49.50
	Methanol Extractive	39.42
	Chloroform Extractive	45.54
	Acetone Extractive	40.75
	Ethyl Acetate Extractive	50.20
	Water Extractive	30.56
3.	Loss on Drying	4.5

*Each value is an average of three determinations

Fluorescence Analysis

The powder were subjected to fluorescence analysis as per the standard procedure. The results are listed below in Table 4.

Table-4 fluorescence analysis of leaves powder of *asparagus racemosus*.

Reagents	UV Short light (254 nm)	UV Long light (366 nm)	Visible light
Powder as such	White	Light white	Greyish white
Powder with (IN) NaOH	Greenish brown	Green	Brownish green
Powder with picric acid	Grey	Light grey	Yellowish grey
Powder with acetic acid	Light brown	Light brown	Light grey
Powder with (IN) HCl solution	Dark red	Light red	Reddish
Powder with 5% FeCl ₃ solution	Blackish brown	Light brown	Reddish brown
Powder with HNO ₃ & NH ₃ solution	Dark brown	Light brown	Coffee brown
Powder with IN NaOH in methanol	Brownish yellow	Light brown	Brown
Powder with methanol	Deep brown	Blackish brown	Brown
Powder with 50% HNO ₃ solution.	Brownish	Light brown	Light brown

Preliminary Phyto-chemical Analysis

Different extracts were subjected to preliminary phyto-chemical analysis to determine the presence of various phytoconstituents and results are tabulated in Table 5.

Table-5 phytochemical screening of extractives for the presence of active constituents in *asparagus racemosus* leaves.

Sr No.	Name of the Test	Petroleum ether extract	Methanol extracts	Chloroform extracts	Acetone extracts	Ethyl acetate extracts	Water extracts
1	Test for Alkaloids						
A.	Dragendroff's Test	+	+	+	+	+	+
B.	Mayer's Test	-	+	-	-	+	-
C.	Wagner's Test	+	+	+	+	+	+
D.	Hager's Test	-	-	-	-	-	-

2 Test for Glycosides

A.	Legal's Test	-	+	-	+	+	-
B.	Baljet's Test	-	-	+	+	+	+
C.	Raymond's Test	-	-	-	-	-	-
D.	Modified Borntrager's test	+	+	+	+	+	+

3 Test for Cardiac

Glycosides

A.	Kedd's Test	-	+	+	-	-	-
B.	Keller-Killiani Test	-	+	+	+	+	-

4 Test for Saponins

A.	Forth Test	-	+	+	-	+	+
B.	Hemolytic Test	-	-	+	-	+	-

5 Test for

Flavanoids

A.	Shinoda Test	-	+	-	-	-	-
B.	Zn-HCl Test	-	-	+	-	-	+
C.	Alkaline reagent Test	-	+	-	+	-	-

D.	Lead acetate test	-	+	+	-	-	+
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E.	Ammonia Test	-	+	+	-	-	-
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6 Test for Tannins

A.	Gelatin Test	-	+	-	+	-	-
B.	Ferric Chloride Test	-	-	+	-	+	+
C.	Vanillin-HCl Test	-	-	+	-	+	-
D.	Lead acetate Test	-	+	+	-	-	+

7 Test for Sterols

A.	Liebermann-Buchard test	+	-	+	-	-	+
B.	Salkowaski Test	-	+	+	+	+	-
C.	Sulphur Test	-	+	+	+	+	-

8 Test for

Anthroquinone

		+	+	+	+	+	+
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Test for

9 Triterpenoids

A.	Liebermann-Buchard test	-	+	-	+	+	-
B.	Salkowaski Test	+	-	-	-	-	+

10 Test for Proteins

A.	Xanthoproteic Test	-	-	-	+	-	-
B.	Millon's Test	-	+	-	+	-	+
C.	Biuret Test	-	+	+	-	-	-
D.	Ninhydrin Test	+	+	-	-	-	-

Test for

11 Charbohydrates

A.	Molisch's Test	+	+	-	+	+	-
B.	Barfoed's Test	+	+	-	-	-	-
C.	Benedict's Test	+	+	-	-	-	-

+ indicates the presence of active constituents,

- indicates the absence of active constituents

CONCLUSION

The plant *Asparagus racemosus* is used widely for curing various diseases like diarrhoea, dysentery, diabetes, jaundis and other urinary disorders and gives a helping hand to the Humans. The results of different pharmacognostic analysis, physical constant values and extractive values determination, powder analysis with different reagents and preliminary phytochemical screening is an essential step towards discovery of new drugs and will help in future for proper identification and authentication of plant.

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