

STANDARDIZATION PROFILES OF ROOTS OF ASPARAGUS RACEMOSUS WILLD.

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Summary

The present study is aimed at the development of physicochemical parameters and to investigate the active principle present in *Asparagus racemosus*. *Asparagus racemosus* (Liliaceae) commonly known as shatavari is an important plant used against various disorders in indigenous system of medicine such as antioxidant, antidiarrheal agent, aphrodisiac, used in the treatment of menopause and immune system modulator. Thus from the extensive literature survey it was revealed that no reports were available on microscopic evaluation, standardization parameters and chemo profile of *Asparagus racemosus* and to check the identity and purity of the drug. The present work embodies the investigations carried out to establish methods for quality control of drugs as per WHO guidelines which includes macroscopical features, physicochemical parameters like loss on drying, foreign matter, extractive value, ash value and to investigate the phytochemical present in the extract in the preliminary level with respect to thin layer chromatography were also carried out for the quality control of the drug. Thus, it was thought worthwhile to explore this plant on the basis of these standardization parameters. The study will provide referential information for the correct identification of the crude drug.

Keywords: *Asparagus racemosus*, standardization, phytochemical studies, extraction

INTRODUCTION

Asparagus racemosus Willd.(Family: Liliaceae) is an under shrub climbing herbs with a tuberous root stock producing annual stems up to several meter long, flowers are white and unisexual in nature, Fruits are globular or obscurely 3 lobed, pulpy berries which are purplish black when they are ripen, seeds are hard and brittle. The herb is distributed in tropical and subtropical forest and in central parts of India. In the Traditional System of Medicine the herb is used mainly to promote milk secretion, as demulscent, diuretic, aphrodisiac and galactogogue (1). In most cases it is also used in the treatment of stomach ulcers, lung abscess, menopause, herpes, chronic fevers and as a form of health food ingredients in Ayurvedic formulations (2). The herb contains several active constituents which are useful in treating many diseases. It mainly contains steroidal saponins (3, 5), aglycons as asparagin which is an anticancer agent and other pharmacologically important constituents (6). Leaves mainly contain rutin, diosgenin and a flavonoid as quercetin 3- glucuronide. Flowers contain quercetin hyperoside and rutin (7). Thus taking in to the view of this plant, the present investigation is directed to remain some pharmacognostic parameters of the roots for strengthening the traditional knowledge with scientific bases.

MATERIAL AND METHOD

Plant material

The roots of *Asparagus racemosus* (W.) (Family: Liliaceae) were collected in the month of April and May from Purnia district, Bihar, India and were authenticated by the botanist of P G College, Uttarkashi, Uttarakhand, India. The herbarium was prepared and kept in the Department for future reference. The plant materials were prepared in accordance to the method of National Institute of Health and Family Welfare (NIHFW), New Delhi, India. The collected roots were washed; shade dried and was pulverized with mechanical pulveriser for size reduction. It was then passed through mesh 40 and the fine powder was collected and used for the experiment and preparation of extract.

Pharmacognostic Studies

Morphological Studies were carried out by using simple determination technique, the shape, size, color, odor, margin and apex.

Physico chemical parameters

The parameter was done to evaluate the percentage of total ash, water soluble acid insoluble ash were calculated as per Indian Pharmacopoeia The extract of the powdered leaves were prepared with the different solvents for the study of extractive value. Fluorescence analysis was also carried out for the powder (8, 9).

Preliminary phytochemical analysis

For the Preliminary phytochemical analysis, the extract was prepared by weighing 100gm of dried powdered leaf and were subjected to maceration with different solvents as per the Polarity, Petroleum ether, Benzene, Chloroform, Ethyl acetate, Ethanol, Methanol and finally with Aqueous. The extracts were filtered in each step, concentrated, and the solvent was removed by rotary evaporator. The extracts were dried over desiccator and the residues were weighed. The presence and absence of the primary and secondary phytoconstituents was detected by usual prescribed methods (10, 11).

RESULT AND DISCUSSION

Macroscopic Characters of Root:

TABLE 1: MACROSCOPIC CHARACTERS OF ASPARAGUS RACEMOSUS ROOTS

Constants	Features
Shape	The roots are fleshy, tuberous, tapering towards both ends, swells when soaked in water.
Size	10-60 cm in length, 1-2.5 cm in thickness.
Colour	Fresh roots are white to buff in colour, dried roots are white to greyish white in colour
Surface	Rough, sign of shrinkage after drying.
Texture	Short and Fibrous
Odour	Characteristic
Taste	Slightly bitter

Fluorescence Analysis

The powder drugs were subjected to fluorescence analysis as per the standard procedure. The results are provided in the tables listed below

TABLE 2: FLUORESCENCE ANALYSIS OF ROOT POWDER OF ASPARAGUS RACEMOSUS.

Reagents	UV Shortlight (254 nm)	UV Longlight (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

TABLE 3: BEHAVIOUR PATTERN OF POWDERED ASPARAGUS RACEMOSUS. ROOTS ON TREATMENT 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 (1N)	Yellowish
Powder with picric acid solution	Greenish yellow

Physicochemical Parameters

The powdered drug was evaluated for its physico-chemical parameters like Ash values: Acid Insoluble ash, water soluble ash, water insoluble ash, extractive values (Alcohol and water soluble values), loss on drying and foreign matter (9). All the results are tabulated below.

Table 4: PHYSICAL CONSTANT VALUES OF ASPARAGUS RACEMOSUS ROOT.

Constant	% Yield (w/w)*
Total ash	7.67
Acid soluble ash	6.65
Acid insoluble ash	1.02
Water soluble ash	2.53
Water insoluble ash	5.14
Drying on loss	3.94
Foreign matter	2.04

*Each value is an average of three determinations

Preliminary Phytochemical Analysis

The ethanolic extract was subjected to preliminary phytochemical analysis for their presence of the constituents. It showed the presence of alkaloids, tannins and proteins were found to be present in aqueous extract where as Steroids and saponins were also found in Alcoholic extract.

TABLE 5: PHYTOCHEMICAL SCREENING OF EXTRACTIVES FOR THE PRESENCE OF ACTIVE CONSTITUENTS IN *C GRANDIS* LEAVES (TREASE AND EVANS, 1985; TYLER, BRADY AND ROBBERS, 1985).

<i>Extract</i>	<i>Reducing sugars</i>	<i>Alkaloids</i>	<i>Sterols</i>	<i>Tri-terpenoids</i>	<i>Saponin</i>	<i>Flavonoids</i>	<i>Tannins</i>	<i>Anthraquinone</i>
Petroleum ether	-	-	+	-	-	-	-	-
Benzene	-	-	+	-	-	-	-	-
Chloroform	+	-	+	-	-	-	-	-
Ethyl acetate	+	-	+	-	-	-	-	-
Ethanol	+	-	+	-	+	-	-	-
Methanol	+	-	+	-	+	-	-	-
Water	+	-	+	-	+	-	-	-

+ indicates the presence of active constituents, - indicates the absence of active constituents

TABLE 6: EXTRACTIVE VALUES OF *COCCINIA GRANDIS* LEAVES WITH DIFFERENT SOLVENTS BY MACERATION METHOD (10).

Solvent	% Yield (w/w) *	Colour of extractive
Petroleum ether (60-80 °C)	0.43	Yellowish gray
Benzene	0.25	Dark brown
Chloroform	0.93	Brownish black
Acetone	9.22	Brownish red
Ethanol	17.33	Brown
Methanol	19.39	Deep brown
Water	16.02	Dark brownish

*Each value is an average of three determinations

Conclusion

Now a day the standardization of crude drugs has become very important for identification and authentication of a drug. But due to certain problems the importance was not up to the mark. Thus, the lack of standardization technique fails to identify the dug from its originality which there by exploits the usage of drug from its Traditional System of medicine. The plant *Asparagus racemosus* is used widely for curing various diseases like diabetes (12) and gives a helping hand

to the Humans. Thus a perfect protocol was designed for its Authentication and identification on the basis of Microscopy and chemical analysis. Thus the present investigation was aimed and the results were found to be significant and encouraging towards the goal for Standardization. The results of different pharmacognostic analysis (macroscopic and microscopic studies, physical constant values and extractive values determination, powder analysis with different reagents, fluorescence analysis and preliminary phytochemical screening have been done; will help in future for proper identification of *Asparagus racemosus* in intact form or in a powdered form

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