

PHARMACOGNOSTIC PROFILES OF LEAVES OF COCCINIA GRANDIS (L.) VOIGT.

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Summary

The study is aimed at development of physicochemical parameters and to investigate the active principle present in *Coccinia grandis*. *Coccinia grandis* (Cucurbitaceae) commonly known as Ivy Gourd is an important plant used against various disorders in indigenous system of medicine such as antioxidant, anti-hypoglycemic agent, laxative, used in the treatment of gonorrhoea 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 *Coccinia grandis* 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: *Coccinia grandis*, standardization, phytochemical studies, extraction

Introduction

Coccinia grandis (L) Vogt.(Family: Cucurbitaceae) is a climbing perennial herbs with a tuberous root stock producing annual stems up to several meter long, flowers are white and unisexual in nature, Fruits are ovoid to oblong berries green in unripe state and red in ripen state. Seeds are ovoid, compressed and grey in colour. The herb is distributed almost all over the world. The leaves of the plants posses antidiabetic, anti-inflammatory, antipyretic, analgesic, antispasmodic, antimicrobial, cathartic, expectorant activities (1). The plant contains a number of secondary metabolites namely b-amyrine, lupeol, cucubbitacin, cephalandrol, cephalandrine and flavonoids (2). Considering the significant of this plant, the present investigation is directed to remain some pharmacognostic parameters of the leaves as a whole and its powdered form.

Material ad Method

Plant material

The leaves of *Coccinia grandis* (L.) Voigt. (Family: Cucurbitaceae) were collected in the month of April and May from Purnia district, Bihar, India and were authenticated by the taxonomist of Central National Herbarium, Botanical Survey of India, Shibpur, Howrah, India bearing herbarium reference number CNH/1-I (44)/2006/ Tech II/996. The herbarium was prepared and kept in the Department for future reference. The collected leaves 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.

Leaf constant

Various leaf constant such as vein termination number, vein islet number, palisade ratio, stomatal number and stomatal index were studied with the help of microscope (3).

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 (4, 5).

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 (6, 7).

Result And Discussion

Macroscopic Characters of Leaf: Leaf apex was pointed with symmetrical base and entire margin. Emerald green, odorless and bitter leaves of *Nerium indicum* with size having length 3.3-20.5 cm and width 0.6-2.3 cm. The veniation was parallel, Petiole was slightly whorled; veniation was parallel and surface was smooth at the adaxial and rough at abaxial.

TABLE 1: MACROSCOPIC CHARACTERS OF COCCINIA GRANDIS LEAVES

Constants	Features
Leaf	Simple
Shape	Ovate in outline with a basal sinus (Heart to pentagon form)
Size	3-10 cm in length and 4-10 cm in wide
Colour	Fresh leaves are green and in the dry state greyish green
Surface	Upper surface glabrate and lower surface hispid
Base	Symmetric
Margin	Sinute
Apex	Mucronate
Venation	Multicostate reticular diverging type
Orientation	Coriaceous
Texture	Fibrous
Odour	Characteristic
Taste	Slightly bitter

TABLE 2: MICROSCOPIC CHARACTERS OF COCCINIA GRANDIS LEAVE (8).

Parameters	Range	Average
Vein-islet number	7-9	8
Palisade ratio	18-24	21
Stomatal index	14-18	16

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 3: FLUORESCENCE ANALYSIS OF LEAVES POWDER OF COCCINIA GRANDIS WITH VARIOUS CHEMICAL REAGENTS UNDER UV AND VISIBLE LIGHT (4).

Reagents	UV Short(254 nm)	UV Long(366 nm)	Visible light
Powder as such	Bluish green	Light green	Green
Powder with (IN) NaOH sol.	Greenish brown	Green	Brownish green
Powder with picric acid	Bluish green	Dark green	Yellowish green
Powder with acetic acid	Light blue	Very light green	Very light green
Powder with (IN) HCl solution	Dark blue	Very light green	Very light green
Powder with 5% FeCl ₃ solution	Blackish blue	Light green	Reddish green
Powder with HNO ₃ & NH ₃ solution	Dark blue	Light brown	Coffee brown
Powder with IN NaOH in methanol	Brownish black spot	Dark brown green spot	Brown with green spot
Powder with methanol	Deep green	Blackish brown	Very dark green
Powder with 50% HNO ₃ solution	Bluish black spot	Light brown	Light brown

TABLE 4: BEHAVIOUR PATTERN OF POWDERED COCCINIA GRANDIS LEAVES ON TREATMENT WITH DIFFERENT CHEMICAL REAGENTS (4).

Reagents	Observation
Powder as such	Greyish green
Powder with acetic acid	Light green
Powder with conc. sulphuric acid	Blackish green
Powder with conc. nitric acid	Dark brown
Powder with conc. hydrochloric acid	Brownish green
Powder with ferric chloride solution	Reddish green
Powder with 5% iodine solution	Brownish green
Powder with ammonia solution	Light green
Powder with aqueous sodium hydroxide solution (I N)	Brownish green
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 5: PHYSICAL CONSTANT VALUES OF *COCCINIA GRANDIS* LEAVES.

Physico chemical Constants	% Yield (w/w)*
Total ash	11.67
Acid soluble ash	9.65
Acid insoluble ash	1.02
Water soluble ash	4.93
Water insoluble ash	6.74
Drying on loss	1.25
Foreign matter	1.74

*Each value is an average of three determinations

TABLE 6: PHYTOCHEMICAL SCREENING OF EXTRACTIVES FOR THE PRESENCE OF ACTIVE CONSTITUENTS IN *C GRANDIS* LEAVES (TREASE AND EVANS, 1985; TYLER, BRADY AND ROBBERS, 1985).

Extracts	Amino acid	Alkaloids	Steroids	Triter- penoids	Saponin	Flavonoids	Tannins	Anthra- quinone	Reducing sugar
Petroleum ether	-	-	-	+	-	-	-	-	-
Benzene	-	-	-	+	-	-	-	-	-
Chloroform	-	-	-	+	-	-	-	-	+
Ethyl acetate	-	-	-	+	-	-	-	-	+
Ethanol	-	+	-	+	-	-	-	-	+
Methanol	-	+	-	+	-	-	-	-	+
Water	-	+	-	+	-	-	-	-	+

+ indicate presence of secondary constituents, - indicate absence of secondary constituents.

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

Sovent	% Yield (w/w) *	Colour of extractive
Pet ether (60-80 °C)	0.48	Yellowish
Benzene	1.25	Greenish brown
Chloroform	2.93	Dark green
Acetone	3.22	Green
Ethanol	7.39	Green
Methanol	9.39	Dark green
Water	13.02	Dark brownish green

*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 *Coccinia grandis* is used widely for curing various diseases like diabetes (11) 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 *Coccinia grandis* in intact form or in a powdered form

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