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Therapeutic Importance of *Rubia cordifolia* Linn. and its Phytochemical Analysis

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ABSTRACT

Aim: Phytochemistry of Manjistha root was done to compare the relevant therapeutic effect. **Materials and Methods:** Manjistha root was evaluated to determine total, water soluble, acid insoluble ash & extractive values. Organic matter was determined for the presence or absence of carbohydrates, alkaloids, amino acids, protein, saponin, glycosides, phenolic compound, tannins from aqueous & alcoholic extract. **Results:** Three tests in aqueous and two tests in alcoholic extract were found positive of carbohydrates. Alkaloids were found positive in two tests for aqueous extract and two tests from alcoholic extract. In both the extracts the amino acids was found positive which have major role in the detoxification of blood. Foam test was found positive in aqueous extract which is done for saponin which is a cleansing agent & washout the poison from vegetables. Keller kilini test was found positive only in aqueous extract which is done for glycosides. Phenolic compound was positive for both extract. Phenol plays a role as antiseptic along with anticarcinogenic, antioxidant properties. All the 4 tests in both extract were found positive which is done for tannins which play a major role as chemical antidote by precipitating most of the poisonous compound. **Conclusion:** Carbohydrates, alkaloids, amino acids, saponin, glycosides, phenolic compounds and tannins were found as a major constituent in *Rubia cordifolia* Linn. root which will play a major role as an antitoxin, detoxification of blood, antiseptic, antimutagenic, anticarcinogenic and antioxidant agent.

KEYWORDS

Phytochemistry, Saponin, Glycosides, Tanin, Anticarcinogenic



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INTRODUCTION

Pharmacognosy is the study of identification of drugs derived from natural sources. The concept of standardization and quality control of drug can be found in ancient Ayurvedic texts. Assessment of complete and accurate physicochemical value of Ayurvedic herbs not only provides scientific basis of its quality but also helps in globalization of Ayurveda. Under these circumstances, pharmacognosy, pharmacology and phytochemistry are necessary for authentication of crude drug and to prove therapeutic action as well.

Phytochemical screening is very important for identifying the quality as well as medicinal importance of a particular plant. The preliminary phytochemical studies were performed for testing the different chemical groups present in the drug¹. It defines the screening, extraction and identification of the medicinally important active ingredients in the plant. Plants contain various chemicals. These are produced either by primary or secondary metabolism². They help in plant growth and protect them from pathogens, predators and enemy³. Mostly they are termed as research compounds because their medicinal importance depends on their phytochemicals^{4,5}.

For the proper identification and authentication, the present research drug i.e. *Rubia cordifolia* Linn. was subjected to preliminary pharmacognostical and phytochemical analysis.

AIMS AND OBJECTIVES

- Examination, purification and characterization of the constituents of Manjistha root of pharmaceutical interest and in process of quality control.
- Quantitative evaluations of *Manjistha* root.
- To study the Pharmacognostical and Phytochemical study of Manjistha root for relevant therapeutic application in medicine.

MATERIALS AND METHODS

Collection of Plant Materials – The Manjistha used for the study was collected from local area of Varanasi.

Methods – Qualitative examination of organic matter

- 1) Test for carbohydrate – Molisch's, Benedict's test, Fehling's test.
- 2) Test for alkaloids – Mayer's reagent, Dragon Droff's reagent, Wagner's test, Hager's test.
- 3) Test for proteins – Ninhydrin, Millions test, Xanthoprotic reaction.

4) Test for tannin – When aqueous extract of the drug is treated with Vanillin HCL alcohol reagent Brick or red colour is formed, showing the presence of tannin.

5) Test for Glycoside – Keller – Killiani test

6) Test for saponin – About 1 ml of aqueous extract is diluted by distilled water up to 10 ml and shaken in a graduated cylinder for 15 minutes. Formation of 1cm layer of froth indicates presence of saponin.

7) Test for phenols – 2ml of drug extract is taken in a test tube and added 2ml of

FeCl₃ solution. Blue – Violet/ Red or Deep Green colour of the solution is suggestive to presence of Phenols.

8) Flavonoids – Shinoda test.

Table 1 Ash values of the *Rubia cordifolia* Linn.

Sr.	Test	Value
1.	Total ash	6.58%
2.	Water Soluble ash	21.68%
3.	Acid insoluble ash	0.95%

Table 2 Determination of Extractive values in extraction of *Rubia cordifolia* Linn.

Sr.	Solvent	% of extract
1.	Aqueous extract	24.64%
2.	Alcoholic extract	16.52%
3.	Petroleum ether extract	5.69%

Table 3 Observation of Qualitative analysis of Organic matter in *Rubia cordifolia* Linn.

Sr.	Tests	Aq. Ext.	Al. Ext.
1.	Carbohydrate		
A.	Molish test	+	-
B.	Benedict test	+	-
C.	Barfoad test	-	-
D.	Fehling test	+	+
2.	Alkaloids		
A.	Dragondrof test	+	+
B.	Wagner's test	-	-
C.	Mayer's test	-	-
D.	Hager's test	+	+
3.	Amino acids		
	Ninhydrine	+	+
4.	Protein		
A.	Biuret test	+	-
B.	Xenthoprotic test	-	+
C.	Millon test	-	-
5.	Saponin		
	Foam test	+	-
6.	Glycosides		
A.	Keller kilini test	+	-
B.	Borntrager's test	-	-
7.	Phenolic compound	+	+
8.	Flavonoids	-	-
9.	Tannins		
A.	FeCl ₃	+	+
B.	Lead acetate	+	+
C.	Pot. Dichromate	+	+
D.	Gelatin test	+	+

DISCUSSION

Phytochemical analysis of Manjistha stem is available in the Ayurvedic Pharmacopoeia of India but that of Manjistha root is not available. The observed phytochemical results of Manjistha root are very similar to that of stem, which is available in A.P.I.

By observing the table no. 1 it was found that total ash value of Manjistha root is 6.58%, water soluble ash is 21.68% and acid insoluble ash is 0.95%.

Maximum extract 24.64% obtained in aqueous extract, 16.52% extract in alcoholic extract & 5.69% extract obtained in petroleum ether extract as shown in table no. 2.

Priya nighantu has mentioned about raktashodhaka (blood purifier) property of Manjistha which is similar to therapeutic properties of its one of ingredient amino acid which having the role in the detoxification of blood. Foam test is also positive in one sample which means that it contains saponins as seen in table 3. Saponin is best cleansing agent hence the decoction of Manjistha can be used to washout the poisons from dermal layer of vegetables. Ayurveda has also mentioned the Tikta and Kashaya rasa of Manjistha which help in the absorption of poisonous substance present over vegetables.

In phytochemical analysis of Manjistha root phenol was found. As phenol is best antiseptic and used to prevent the infectious pathology, the decoction of Manjistha root may be used as an antiseptic solution to prevent the infection. Recently phenolic compound has found significant role in the prevention and treatment of cancer.

Ayurveda has already mentioned the Raktashodhak property of Manjistha which is useful in the treatment of skin and cosmetic diseases including acne vulgaris. Tannin is the main ingredient of root. Solution of tannic acid acts as a chemical antidote by precipitating most of the poisons like alkaloids and metallic poisons.

These days the fashion of addition of colouring agents in the dietary products has been increased. Long term use leads to hazards in form of carcinogenic effects. Manjistha has a natural colouring agent and the dyes produce from Manjistha can be used as a dietary colour.

CONCLUSION

Ayurveda has a store of natural herbal medicine having specific – nonspecific roles to prevent and cure the disease. *Rubia cordifolia* Linn. was found positive for carbohydrate, alkaloids, amino acids,

saponin, glycosides, phenolic compound and tannins as a medicinal phytochemical active principal which will play a major role as an antitoxic, detoxification of blood, antiseptic, antimutagenic, anticarcinogenic and antioxidant agent. Thus the Manjistha has proved its therapeutic indications mentioned in Ayurveda on the basis of medicinal chemistry.

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