



Preliminary Phytochemical Studies of Leaf Extracts of *Molineria Recurvata*

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ABSTRACT

Molineria recurvata (Fam. Hypoxidaceae) is an herb. It is also known as palm grass. Leaves are alternate having parallel-veined, or pinnately veined. Stomata are present. Secretary cavities may be present or absent. Flowers are regular. The fibers from the plant have been used for purposes such as making nets, and the fruit is edible. The present study deals with the phytochemical screening on leaf extract of *Molineria recurvata*; belongs to family Hypoxidaceae. This plant has a high economic importance due to its various medicinal properties. Extraction of bioactive compounds from this medicinal plant permits demonstration of its physiological activity. It also facilitates pharmacological studies leading to discovery of synthesis of more potent drugs. The phytochemical screening revealed the presence of alkaloids in high concentration followed by hydroxy-anthraquinone glycosides, phytosteroids, dextrin, flavonoid etc. Powder analysis parameters like extractive value, total ash, acid insoluble ash, water soluble ash and loss on drying were also determined. The above mentioned phytochemical study helps the researchers to identify the specific plants and also to know the phytoconstituents for future work. Details studies of phytochemicals isolation are going on in our laboratory for pharmacological evaluation.

Key words: *Molineria recurvata*, phytochemical evaluation.

INTRODUCTION

Nature has provided a complete storehouse of remedies to cure ailments of mankind. From ancient times, medicinal herbs have been used in different forms, under indigenous systems of medicine like Ayurveda, Sidha and Unani [1]. All classes of plants viz. Thallophyta, Bryophyta, Pteridophyta and Spermatophyta contain species that yield primary and secondary products of medicinal importance. All of the Herbal medicines are promising choice over modern synthetic drugs as they show minimum or no side effects and are considered to be safe [2]. These Herbal medicines have been practiced worldwide and are now recognized by WHO as an essential building block for primary health care [3].

All of these medicinal plants contain minerals and inorganic nutrients which are required for healthy growth [4]. Except these, they also contain another special phyto-component (e.g. alkaloid, glycoside, flavonoid, terpenoid etc) which have received considerable attention in recent years due to their vast pharmacological properties including cytotoxicity and cancer chemopreventive effects [5]. And these constituents are the backbone of modern medicine.

Molineria recurvata (Hypoxidaceae), grown in hotter regions of India. This annual herb bears blackish elongated tuberous root having several lateral roots with rosette or short petiolate, linear, lanceolate long leaves close to the ground level. It has been used in the indigenous system of medicine for long periods.

Therefore, present investigation was planned to find out the different phytoconstituents with powder analysis of *M. recurvata*.

EXPERIMENTAL SECTION

Collection of Plant Material

M. recurvata was collected from the rural belt of Tripura during the month of February-March. After authentication, fresh plant material was collected in bulk, washed under running tap water to remove adhering material, dried under shade and pulverized in a mechanical grinder. The coarse powder of leaf was passing through sieve no.40 and 120 and is taken for further studies.

Preparation of Drug Extract

The powder leaf was extracted successively with petroleum ether, chloroform, Acetone, Benzene and methanol in soxlet extraction apparatus (Hot extraction). 100gm of dried coarse powder of leaf of *M. recurvata* were successively extracted by using solvents of increasing polarity i.e. Petroleum ether (60°C – 80°C), Chloroform, Acetone, Benzene and Methanol [6]. The extract was filtered while hot and the resultant filtrate was distilled in vacuum under reduced pressure in order to remove the solvent completely. It was dried and kept in a desiccator till experimentation. Obtained extract was weighed and percent yield was calculated in terms of air-dried powdered crude material. The percentage yield of different extracts of powdered leaf of *M. recurvata* and their colour, consistency were noted. The individual extract of *M. recurvata* was subjected to qualitative investigation for the presence of phytoconstituents responsible for the therapeutic values of the drug like presence of alkaloids, hydroxy-antraquinone glycosides, phytosteroids and flavanoides etc [7]. Fluorescence characteristics of all successive extracts of leaf of *M. recurvata* were observed. The *M. recurvata* leaf powder was subjected to determination of extractive value (Ethanol Soluble extractive), total ash, acid insoluble ash, water soluble ash and loss on drying.

RESULTS AND DISCUSSION

Colour, Consistency and Percentage Yield

In Phytochemical investigation the percentage yield of methanol extract was found to be more (3.65%) when compared to Petroleum ether (60°C – 80°C), Chloroform, Acetone, Benzene and Methanol shown in table 1.

Preliminary Phytochemical Studies

The qualitative investigation test performed in five extracts (Pet. ether, Chloroform, acetone, benzene and methanol) revealed the presence of alkaloids, hydroxy-antraquinone glycosides, steroids, carbohydrate and flavonoids etc [8, 9] which is given in table 2. The presences of organic constituents are considered to be responsible for therapeutic action.

Fluorescence Analysis of Successive Extracts

The concentrated petroleum ether, chloroform, acetone and methanol extract of the leaf were subjected to fluorescence characteristics studies. All extracts viewed under ordinary light and UV light having wave length of 256 nm and 366 nm [10]. This is tabulated in table 3.

Powder Analysis

Further, powder analysis were also carried out to investigate different parameters like extractive value, total ash, acid insoluble ash, water soluble ash and loss on drying [11]. In powder analysis ash values are useful in determining the quality and purity of crude drug, especially in the powder form and the extractive values are useful for their evaluation, especially when the constituents of a drug cannot be readily estimated by any other means. Further, these values indicate the nature of the constituents present in a crude drug.

Table1: Data shows the colour, consistency and yield percent of *M. recurvata* leaf powder by cold extraction

Sl. No.	Type of Extract	Colour and consistency	Odour	Yield percent
01	Petroleum ether(60°C - 80°C)	Green	characteristics	1.38%
02	Acetone	Greenish brown	characteristics	3.01%
03	Benzene	Greenish brown	characteristics	2.28%
04	Chloroform	Deep brown	characteristics	1.14%
05	Ethanol	Light brown	characteristics	2.83%
06	Methanol	Light brown	characteristics	3.65%

Table 2: Qualitative phytochemical test of different leaf extracts of *M. recurvata*

Sl. No	Phytochemical Test	Petroleum ether (60°C- 80°C) Extract	Aceto-ne extract	Benze-ne extract	Chloroform extract	Methanol extract
1. Test for alkaloid						
A.	Mayer's test	+++	+++	+++	+++	+++
B.	Wagner's test	+++	+++	+++	+++	+++
C.	Hager's test	+++	+++	+++	+++	+++
D.	Dragendorff's test	+++	+++	+++	+++	+++
E.	Tannic acid test	+++	+++	+++	+++	+++
F.	Picrolonic acid test	+++	+++	+++	+++	+++
G.	Phosphomolibdic acid test	+++	+++	+++	+++	+++
2. Test for carbohydrate						
A.	Molish's Test	+	+	+	+	+
B.	Fehling's Test	+	+	+	+	+
C.	Barfoed's Test	+	+	+	+	+
D.	Benedict's Test	+	+	+	+	+
E.	Selivaniff's test	+	+	+	+	+
F.	Test for pentose	+	+	+	+	+
G.	Osazone formation test	+	+	+	+	+
H.	Borntrager's Test	+	+	+	+	+
I.	Legal's Test	+	+	+	+	+
3. Test for saponine						
A.	Froth formation test	-	-	-	-	-
B.	Haemolysis test	-	-	-	-	-
4. Test for steroid						
a.	Libermann – Burchard's Test	++	++	++	+++	++
5. Test for sulphate						
A.	Berium chloride test	-	-	-	-	-
6. Test for tannin(phenolic compound)						
A.	Goldbeater's skin test	-	-	-	-	-
B.	Ferric chloride test	-	-	-	-	-
C.	Phenazone test	-	-	-	-	-
D.	Gelatin test	-	-	-	-	-
E.	Test for catechin	-	-	-	-	-
F.	Test for chlorogenic acid	-	-	-	-	-
7. Test for Flavonoid						
A.	Shinoda test	++	++	++	++	+++
B.	Alkaline reagent test	++	++	++	++	+++
C.	Zinc hydrochloride test	++	++	++	++	+++
8. Test for hydroxy-antraquinone glycoside						
A.	Potassium hydroxide test	+	+	+	+	+
9. Test for starch						
A.	Iodine test	-	-	-	-	-
10. Test for dextrin						
A.	Iodine test	+	+	+	+	+

(-) = Absent, (+) = slightly present, (++) = moderately present, (+++) = present in a large amount.

Table 3: Fluorescence characteristics of successive extracts in *M. recurvata* leaf extract

Sl. No.	Types of Extract	Day Light	UV Light Short	UV Light long
1	Petroleum Ether Extract (60°C – 80°C)	Green	-	-
2	Chloroform Extract	Deep brown	-	-
3	Methanol Extract	Light brown	-	-
4	Acetone extract	Grenish brown	-	-

Table 4: Powder analysis of root tuber of *M. recurvata*

Sl. No.	Parameters	Percentage (w/w)
1	Extractive Value (Ethanol Soluble extractive)	7.78%
2	Total ash	14.035%
3	Acid insoluble ash	3.099%
4	Water soluble ash	2.2%
5	Loss on drying	0.1469%

CONCLUSION

The comparative and multidisciplinary approach to the study of *M. recurpata* does help in understanding their medicinal importance in depth. The adulterants in drugs obtain from *M. recurpata* can be identified by this investigation. The investigation shows the presence of alkaloids, hydroxy-anthraquinone glycosides, steroids, carbohydrate and flavonoid. All these studies will be of immense use in carrying out further research and revalidation of its use in Ayurvedic system of medicine.

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