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Some common medicinal plant recurring jaundices disease as future source of drugs

D. B. Dupare

Shri Dr R.G.Rathod Arts and Science College. Murtizapur Di.Akola

**Email: duparedharam5@gmail.com*

ABSTRACT

This study is on the identification and traditional uses of some medicinal plants around the Amravati region. The traditional use of medicinal plants for preventive and creative purposes among the people from generation to generation. Several species of medicinal plants such as *Ailanthus excels Roxb, Cichorium intybus L, Echinops echinates Roxb, Ricinus communis* L.etc were identified to be naturally distributed in Amravati region. Most of the plant parts (extract) identified eg.(bark root, leaf) serve as major source of active ingredient and products of secondary metabolites e.g alkaloid, terpenoids etc used in curing diseases, production of drugs as well as in maintaining good health by the traditional practitioners. Several visits were made to the various tribal area like satpuda hill and other local area to the various autonomous communities between February-2015 and October-2015 for collection, identification and naming of the plants were used. Plants were collected and preserved in the laboratory. Two basic methods of drug preparations were used among people. These were the process of infusion (extracting active medicinal constituent of the plant through the medium of hot water (boiling) and Decoction (simmering the thicker and less permeable part of the plant for easy extraction of their medicinal constituent). The prepared infusion is then administered to the sick person for a period of time depending on the type of sickness. The conclusion of this research work is that the vital role of medicinal plants should not be left in the hands of the practitioners only rather a more holistic approach should be adopted. This will involve a synergy between the traditional and orthodox practitioners that will aim at formulating an integrative health for the overall goal of maintaining, enhancing and sustaining good health care.

Keywords: medicinal plant, jaundice, Traditional medicine, phytochemistry.

INTRODUCTION

Since an ancient time man as well as animal has belived so much on medicinal plants for health. The traditional use of medicinal plants for curing and preventing illnesses, including the promotion of both physical and spiritual well-being among human beings. Several species of medicinal plants have been identified to be naturally distributed in all the autonomous communities of Amravati region includes specially satpuda hill area like Melgat area, Dharni region, boundary area of Maharashtra and Madhaypradesh. Medicinal plants contain some organic compounds which produce definite physiological action on the human body and these bioactive substances including tannins, alkaloids, terpenoids, steroids and flavonoids etc(1). Many of these natural products have vital role as mediators of ecological interactions; defense against predators and pathogens. They have functions in ensuring a continued survival of particular organisms in often hostile environments where there is competition with other organisms.

Jaundice is known as Hariman disease in Rig-veda (800 BC).The first record of Hepatitis was reported by Hippocratic School in 200B.C (Nene, 2007).Jaundice is recognized disease from Charaka (700 BC) and it is called as Kamala (2).

Symptoms of Jaundice:

Jaundice may be caused by an obstruction of bile ducts which normally discharge bile salts and pigments into the intestine. It is caused by bilirubin

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which comes from red blood cells. The colour of the skin and urine is vary, depending on the level of bilirubin. The yellow discoloration of the skin and mucous membranes occur due to an increase in the bile pigments means, bilirubin in blood. When the level of the bilirubin mildly elevated, they are yellowish. When it's high; they tend to be brown colour. It disturbs the function of liver and consequently secretion of bile. The symptoms of patients, eyes and urine become yellow, and feel to extreme weakness, headache, and fever, loss of appetite, severe constipation, nausea, and yellow coloration of the eyes, tongue, skin and urine, Haemoglobin, the iron containing chemical in red blood cells that carries oxygen, became low that is caused by high levels in blood of the chemical bilirubin and fatigue ultimately and succumbs to jaundice in case of severe attack. The obstruction of the bile ducts could be due to gallstones or inflammation of the liver, which is known as hepatitis and is caused by virus. Jaundice may result from various diseases or conditions that affect the liver, like Hepatitis A, Hepatitis B, Hepatitis C, Hepatitis D, Hepatitis E, Auto immune hepatitis, Liver cirrhosis, Liver cancer, Haemolytic anaemia and Malaria(2,19,20.). There is no unique treatment for jaundice and hepatitis by prescribing modern allopathic and homeopathic medicine. Jaundice is a viral disease and spread through poor sanitation and contaminated water and foods in urban and rural areas of India. The present study is carried out to study the phytochemicals present in medicinal plant for recurring of jaundice used by traditional people form generation to generation.

In this study, the presences of phytochemical constituents in these medicinal plants were investigated. The phytochemical compounds responsible for the reported therapeutic uses of these plants were determined. The percentage yield of extracts obtained from these plants by solvent extraction and rotavapour, column separation, microwave technique methods were also determined.

Material and Methods

Collection and preparation of plant materials:

The different survey was conducted during 2014-2015. The interaction of traditionally used etanomedicinal plants were collected from age-old people, traditional doctors, and the person having knowledge of ethno medicinal plants practices to cure jaundice. Some of the commonly occurring 8 Ethno medicinal plants to cure jaundice were listed and the existence of these plants were cross checked and confirmed with the help of officials of local veterinary tribal peoples. The information gathered from one place was confirmed by other different local or tribal people. The plant specimen were collected and identified by referring standard local flora. All the eight plants samples were identified by a botanist. The leaves were dried at 30°C in a thermostatically controlled microwave oven until they attained a constant weight. The samples were then crushed to powder, using a manual grinding machine, so as to enhance effective contact of solvent with sites on the plant materials.

In jaundice, medicinal plants are important and doses are prescribed by local and tribal people with combination of plant parts with extracts, infusion, etc.

Plants extraction:

The fresh leaves, root, bark of sample plants material were collected and dried in microwave oven under controlled 30^0c for 10-20 minutes. The mass obtained was dried and subjected to before extraction by adding dried leaf, root and bark powder of distilled water (1:10), heated to 50-60 ^{0}C under constant stirring conditions for 1hour by using ultsonicater and filtered. The ethanol extract was prepared by using Soxhlet's extraction appataratus, after which was decantation, filtration, and concentration using rotary evaporator at 30^0c to obtain ethanol and water. The soluble sample labeled them LE and LW for ethanol and water fraction of leaves. BE and BW for fraction of ethanol and water of stem bark.RE and RW for fraction of ethanol and water of roots respectively. These fractions were weighed and stored in airtight containers for further use.

Phytochemical analysis:

Chemical tests for the screening of certain phytochemical compounds were performed on the plants extracts using standard procedures as reported by Shad et al. (2013) and Chukwuemeka I.M et al, 2013.

Tannins:

The 10 ml amount of sample was boiled in distilled water and then filtered. Few drops of 0.1% ferric chloride solution were added to the filtrate and the change in colour was observed. The appearance of brownish green or a blue-black colour confirmed the presence of tannins.

Saponins:

The 50ml amount of sample was boiled in distilled water in a water bath and filtered. The filtrate was mixed with distilled water and shaken vigorously until a stable persistent froth. The frothing was mixed with olive oil (2 drops) and shaken vigorously. The formation of emulsion indicated the presence of saponins.

Flavonoids:

Few drops of 1% aluminium solution were added to a portion of ethanolic extract of each sample. A

yellow colouration of the solution indicated the presence of flavonoids.

Shinoda's test Method:

The extract was treated with sodium hydroxide and formation of yellow colour indicates the presence of flavonoids.

Test for Alkaloids

Wagner's Test Method:

1ml of the extract was added to 2ml of wagner's reagent (iodine in potassium), Reddish brown colour precipitate indicates the presence of alkaloids.

Results & Discussion

The phytochemical study of 8 medicinal plants and 6 families has been studied. In this study we found that Echinops echinates Roxb, Ricinus communis L and Abutilon Indicum plants contain high flavonoids than other plant studied plants. Information has been given in table 1. The each species provided Ethno botanical information: taxon name, family, vernacular name, plant parts their use in the treatment of jaundice diseases. In this study, plants were dominant for jaundice because of majority of flavonoids present in leaf extract. Comparison of the plant parts used as a medicinal source indicates that the leaf predominates followed by root, bark.

Phytochemical investigation:

The phytochemical analysis of the various parts of the indigenous plant is shown in Table (1). It reveals that alkaloids, tannins, saponins flavonoids, were all present in ethanol and water extracts of all the plant parts. Flavonoids were found in all leaf extracts. The flavonoids and other like alkaloids, tannins and saponins were present in higher, moderate concentration. This could be used as the indigenes for the cure of antiviral, anti-allergic, anti-inflammatory and as an anti-oxidant agent (5).

Quantitative analysis of phytochemical present in plants extract:

Estimation of the total phenolic content

Total phenolic content in plant extract aqueous extract was determined by standard method of Ranjana sing et al (2015).Tannic acid was used as a standard phenolic compound. Standard calibration curve (Fig-1) was plotted using known concentrations of tannic acid (10 – 100 µg/ml) at 760 nm. For analysis 250 µl of Tannic acid/ plants extract was mixed with 1 ml of distilled water followed by the addition of equal amount of Folin-Ciocalteu reagent. The mixture was mixed and incubated at room temperature for 5 min before the addition of 7 % Na_2CO_3. Then final volume was made up to 6 ml with distilled water. Absorbance of blue colored mixture was observed spectrophotometrically at 760 nm. The total phenol content in the test samples was calculated from the standard curve and expressed as µg tannic acid equivalent (TAE) /mg of concentrated plants extract. This process repeated for number of time to get constant reading for all plants part extract.

Total flavonoids content:

Aluminum chloride colorimetric method was used for flavonoid determination based on standard method of Ranjana sing et al (2015). Reaction mixture containing 100 µl plant extract in 2.0 ml of methanol followed by 0.1 ml of aluminum chloride, 0.1 ml of potassium acetate and 2.8 ml of distilled water was incubated at room temperature for 30 minutes. The absorbance of the colored reaction mixture was measured at 415 nm by spectrophotometer. Sample blank was prepared in similar way by replacing extract with distilled water. In this method quercetin was used as a standard to make calibration curve (Fig. 2). 10 mg of quercetin was dissolved in methanol and then diluted to make different concentrations (1-50 µg / ml). Flavonoids content was estimated as quercetin equivalent µg / ml of concentrated plants extract. This process repeated for number of time to get constant reading for all plants part extract.

Quantitative spectrophotometric analysis for phenolic content and flavonoids:

The total phenolic and flavonoids content of plant aqueous extract were determined spectrophotometrically using the tannic acid and quercetin standard calibration curves, respectively, as per Ranjana sing et al (2015). Both standard curves showed linearity with R_2 value 0.982 and 0.984. The total phenolic and flavonoids content was found as per given table 2 .

Antioxidant activity:

The antioxidant activity was almost determined *in vitro* conditions and several methods could be used for its determination. Generally, with significant linear correlation between phenolics concentration and antioxidant capacity Ranjana sing et al (2015).

Various studies showed that flavonoids and polyphenols act as natural antioxidants. Antioxidant activity is directly related to the total amount of phenolics and flavonoids found in plant extracts as reported by Javed Ahamd et al. The importance major content like flavonoids are useful in plants materials for the treatment of jaundices diseases to recover Haemoglobin, the iron containing chemical in red blood cells that carries oxygen, became low is increasing interest among scientists, Plants extract at the dose of 100 and 200 mg/kg reduced the levels of total, conjugated and unconjugated bilirubin. Bilirubin is a yellow pigment produced when haeme

Figure-1. District wise % infestation by Uzifly *E. bombycis* L. in some breeds of *B. mori* L.

Sr no.	Plant name /family /local name	Medicinal use of plant	Plants photographs
1	Ailanthus excels Roxb. Simaroubiaceae Maharukh	Bark powder given to cure jaundice.	
2	Cichorium intybus L. Asteraceae. Chichory.	Leaves juice used to cure jaundice	
3	Echinops echinates Roxb. Asteraceae Katazendu	Filter juice of root and seeds are used to cure piles and jaundice.	
4	Ficus benghalensis L, Moraceae Wad.	Powder of aerial root to cure jaundice.	
5	Ficus Religiosa. L. Moraceae. Pipal.	Powder of aerial root to cure jaundice.	
6	Physalis minima L. Solanaceae Phophunda	Leaf juice are used to treat hepatitic –B. and fever.	
7	Ricinus communis L., Euphorbiaceae, Arandi.	Leaf juice mixed with cup of milk is used to cure the jaundice.	
8	Abutilon Indicum, Indium Mallow, Malvaceae Petari.	Leaf juice mixed with cup of milk is used to cure the jaundice.	

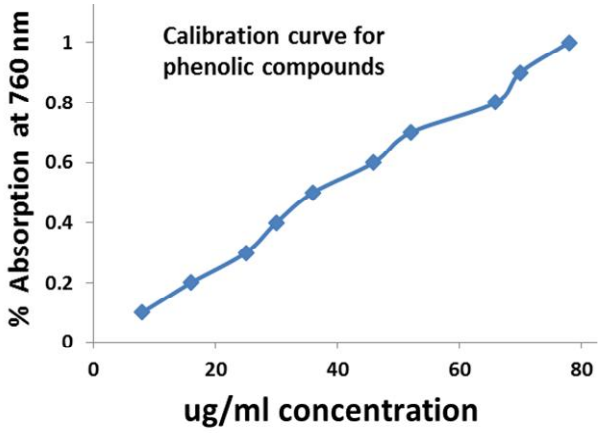
Table-1. Phytochemical screening of extracts of medicinal plants

Sr no	Plant name	Plant parts used	Alkaloids		Tannins		Saponins		Flavonoids	
			ethanol	Water	ethanol	water	ethanol	water	Ethanol	water
1	*Ailanthus excels Roxb.*	bark	+++	+	++	_ _	+	_	++	+
2	*Cichorium intybus L*	leaves	++	++	++	+	+++	++	+++	+++
3	*Echinops echinates Roxb*	root	+++	++	+++	_ _	++	++	+++	+++
4	*Ficus benghalensis L,*	Apical root	++	+	_ _	++	_ _	+++	++	_
5	*Ficus Religiosa. L.*	Apical root	++	+	++	++	+	_	++	_ _
6	*Physalis minima L*	leaves	+++	+++	+	_ _	+	+++	++	+
7	*Ricinus communis L*	leaves	++	++	+++	_ _	+++	++	+++	+++
8	*Abutilon Indicum,*	leaves	++	++	+++	+	+++	_ _	+++	+++

Present test =+.; Moderate concentration =++.,; High concentration=+++., Absent = _.

is catabolized. Tanaka et al reported that polyphenol compounds had inhibitory effects on mutagenesis and carcinogenesis in humans, when up to 1.0g was ingested daily from a diet rich in fruits and vegetables.

Figure-2. Tannic acid calibration curve for phenolic compounds



Conclusion

In the present investigation, 8 medicinal plant species used to treat jaundice and hepatitis were reported. The uses of these plants to treat various illnesses by the communities, because of poor socio-economic conditions, the high cost and a difficult access to allopathic medicines. The majority of the reported species are wild and rare. These demand an urgent attention to conserve such vital resources so as to optimize their use in the primary health care system. Now a day, conservation of traditional knowledge is necessary related to modernization of the region and lack of interest in traditional patrician, in transferring it to next generation. In this context, screening for active substances and testing their activities against jaundice and hepatitis as an interesting subject for the feature studies. Further advanced spectroscopic studies are required for the structural elucidation and identification of compounds.

Figure-3. Quercetin calibration curve for flavonoids

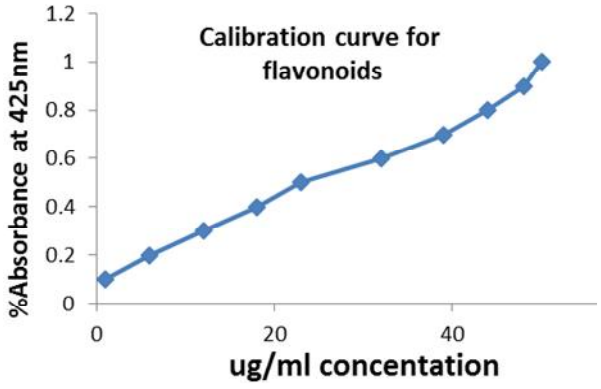


Table-2. The total phenolic and flavonoids content

S.N	*Plant name*	Total phenolic (ug/ml)	Total flavonoids (ug/ml)
1	Ailanthus excels Roxb.	2.344	4.646
2	Cichorium intybus L	6.656	7.898
3	Echinops echinates Roxb	8.454	7.656
4	Ficus benghalensis L.	3.454	2.342
5	Ficus Religiosa. L.	2.656	3.674
6	Physalis minima L	4.234	3.676
7	Ricinus communis L	6.143	8.162
8	Abutilon Indicum.	8.124	9.186

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Conflict of Interests

Authors declare that there is no conflict of interests regarding the publication of this paper.

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