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"A Phytochemical study of Bodhivriksha Twaka"

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Abstract: Bodhivriksha is an important drug described in detail in Ayurvedic classical texts. Ashwatha, a classical Ayurvedic polyherbal formulation is used for the treatment of Rakatpitta Vikaras, Neelameha, Kaphavikaras, Vatrakta and Yoni Doshas. Ashwatha is used in the form of both single drug and compound formulations. The phytochemical analysis showed the presence of alkaloids, saponins, tannins, terpenoids, steroid, flavonoids and carbohydrates. The present study was to evaluate the phytochemical screening of extracts of Twaka of Bodhivriksha. Study has been shown that this medicinal plant can be used as pharmaceutical adjuvants in the formulation of various dosage forms.
Keywords: Bodhivriksha, Formulations, Twaka, Phytochemical screening.

I. INTRODUCTION

Ficus religiosa also known as *Ashwatha,* family of the *Ficus religiosa* is Moraceae. *Ficus religiosa* are produced in Indian subcontinent- Bangladesh, Bhutan, Nepal, Pakistan and India including the Assam region, Eastern Himalaya and the Nicobar Islands as well as part of Indochina-the Andaman Islands, Thailand, Myanmar and peninsular Malaysia. India is the largest sources of medicinal plant in the whole world[1].

The demands of this plant are increasing day by day for medicinal purpose. There are approximately 35000 medicinal plants which are used for therapeutic effect according to *Ayurveda, Siddha, Unani* and other traditional system. In which *Ficus religiosa* is one of the most important for medicinal purpose. It is employed in the treatment of various diseases such as *Vatrakta, Vrana, Neelameha, Hikka, Bhagna* and *Sotha*[2].

The medicinal plant have also been used to Pharmacological activities like Antidiabetic, Coginitive enhancer, Wound Healing, Anticonvulsant, Anti-inflammatory, Analgesic, Antimicrobial, Antiviral, Hypolipidemic, Antioxidant, Immunomodulatory, Antiasthmatic, Antiulcer, Antianxiety, Antihelmenthic and Hypotensive. The aqueous extract of dried bark of *Ficus religiosa* such as flavonoids, tannins, phytosterol, begaptol and bergapten. The bark is affirmed the phytoconstituents of tannins, phenols, flavonoids, alkaloids, steroids, vitamin K, n-octacosanol, methyl oleanolate, lanosterol, β-sitosteryol-D-glucoside, stigmasterol, lupen-3-one[3]. Phytochemical analysis of this medicinal herb can identify the nature of compound present in the extract of *Ficus religiosa.* It is also for identify the bioactive compound and their effect. They are commonly helpful as model for the synthetic of new medicine.

II. MATERIALS AND METHODS

It include the preparation of phytochemical study of drug. The test drug, powder is used for photochemical, pharmacological and clinical studies.

Chemicals- Mayer Reagent, Molisch's Reagent, Hager's Reagent, Dragendorff's Test, Alkaline Reagent Test, Ferric Chloride Test, Lead Acetate Solution Test, Bennedict's Test, Fehling's Test, Libermen-bruchard, Millon's Test, Foam Test, Ferric Chloride Test, Lead Acetate, Potassium Dichromate, Gelatin Test.

Plant material- The bark *Twaka* of selected medicinal plant *Ficus religiosa* was harvested from the Herbal garden of Shri Ganganagar College of Ayurvedic science and Hospital, Tantia University, Sri Ganganagar and authenticated by pharmacy department. The collected *Twaka* were thoroughly cleaned with cotton cloth to avoid dust and other unwanted materials accumulated on the *Twaka* from their natural environment. The dust free *Twaka* were shade, dried at room temperature. After 6-7 days of drying *Twaka* were then grinding into the fine powder by using the grinding machine than the powder material of *Ashwatha Twaka* weighed properly. The fine powder of *Ashwatha Twaka* was stored in a clean and tightly closed container for extraction.

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Table No.-1; Showing the Classification of *Ficus religiosa*

Kindom	Plantae
Subkingdom	Viridaeplantae
Class	Magnoliopsida
Order	Urticales
Phylum	Tracheophyta
Sub-Phylum	Euphyllophytina
Genus	*Ficus*
Species	*religiosa*
Family	Moraceae

A. Preparation of Extracts

Distilled water extract (Aqueous Extraction) - 5gm of powdered *Twaka* was taken in small conical flask. Then 50 ml of distilled water added. Further flask was kept o the rotary shaker at 200rpm for 24 hrs.

Alcohol extract (Solvent Extraction) - 5gm of each powdered *Twaka* sample in 2 different small conical flasks is taken. Then 50 ml of ethanol is added into both of the conical flask. Both the conical flask was kept on soxhlet till the solvent is vaporized completely.

III. OBSERVATION AND RESULT

1) Colour- Observation during collection of sample of *Bodhivriksha* (*Ficus religiosa*) in fresh state was whitish ashy slightly greenish colour outer surface. Inner surface was pinkish and turned to light whitish brown after few hours.

2) Texture- Smooth, Hard, Non-brittle, Having easily removable translucent whitish flakes, curved after drying.

3) Thickness- Varying in shape and size

4) Odour- No characteristic odour

5) Bark microscopy of *Bodhivriksha*- T.S of the bark shows many layered cork, made up of rectangular cells, cork cambium made up of 1-2 layers of cells, secondary cortex many layered, thin walled made up of rounded to polygonal cells, compactly arranged, loaded with prism shaped cells and some of the cells show reddish tannin contents. In between the secondary cortex cells groups of sclerides are present which are of different shapes and size with heavily lignified walls. Lumen shows simple pits. Phloem cells are thin walled, polygonal, medullary rays are uniseriate to biseriate and some of the cells show simple starch grains.

6) Phytochemical analysis of *Bdhivriksha Twaka*- The powder of *Bodhivriksha Twaka* was subjected to phytochemical analysis find out the presence and absence of phytochemical constituents. The phytochemical tests employed for alkaloids, carbohydrate, triterpenoids, steroids, protein, saponins, glycosides, tanins, fixed oil and fats.

A. Test for Alkaloids[4]

Hager's test-5 mg aqueous and alcoholic extract of *Ficus religiosa (Ashwatha)* was taken in two different test tubes and then one drop of Hager's reagent was adding the test tube. Yellow colour precipitate indicates the presence of alkaloids because saturated solution of Picric acid are present in Hager's reagent.

B. Test for Flavonoids[5]

Alkaline reagent test- Two to three drops of sodium hydroxide were added to 2ml of extract. Initially, a deep yellow colour appeared but it gradually became colourless by adding few drops of dilute HCL, indicating that flavonoids were present.

Shinod's test- Ten drops of dilute HCL and a piece of magnesium was added to 1ml of extract, the resulting deep pink colour indicating the presence of flavonoids. Colours varying from orange to red indicated flavones, red to crimson indicated flavonoid, crimson to magenta indicated flavonones. Catechins when treated with vanillin solution in HCL give red pink colour.

Lead ethanoate test- placed 5mg of aqueous extract of *Ashwatha* in test tube then 1ml of lead ethanoate solution was added. It gives the buff coloured solution if the flavonoids are present.

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C. Test for Carbohydrate[6]

Benedicts test- Benedict's reagent was taken for the analysis of carbohydrate. The 5mg extract both aqueous and alcoholic was mixed with few drops of Benedict's reagent in different test tube. Then allowed to boiled, the reddish brown precipitates are found with the presence of carbohydrate.

Fehling's test- Take 2ml of aqueous and alcoholic extract in two different test tubes. Add 2ml of Fehling solution A and Fehling solution B in both the test tube. Keep the solution in boiling water bath for about 10 minutes, the red precipitate are found with the presence of carbohydrate.

D. Test for Triterpenoids7

5ml of each extract were mixed in 2ml of chloroform and 3ml concentrated sulphuric acid was carefully added to form a layer. A reddish brown colour at the interface indicates the presence of triterpenoids.

E. Test for Saponins[8]

Foam test was performed for identification of saponin in the aqueous and alcoholic extract in which 1ml extract was dissolved into the 5ml distilled water. After addition of distilled water it was shaken for proper mixing till foam was observed. Few foam was added with 2 drops of olive oil and it was shaken vigorously. It should be produced emulsion with the saponins.

F. Test for Proteins[9]

Millon's test- 5ml of each extract were mixed with 2ml of Mallon's reagent. The solution was heated for 5min red colour precipitated turns into red colour which confirmed the presence of proteins.

Biuret's test- 5ml of alcoholic extract was added with the few drops of biuret's reagent. The obtained mixture was shaken well and allowed to warm for 5min. appearance of red or violet colour indicated presence of proteins.

G. Test for Tannins[10]

Ferric chloride test- 5ml of each extract were mixed with 0.5 ml of ferric chloride solution. Formation of blackish precipitate which confirmed the presence of tannins.

Gelatine test- 5ml of alcoholic extract was mixed with gelatine and 1ml of water was added into the solution. White precipitate should be produced.

H. Test for Steroids[11]

5ml extract was mixed with 1ml of chloroform then the few drops of concentrated sulphuric acid and acetic were added into it. The greenish colour was indicating the presence of steroids.

I. Test for Oil[12]

Stain test- Few quantity of aqueous and alcoholic extract was spread into the filter paper formation of oil on the filter paper will indicate the presence of oil in aqueous.

IV. RESULT AND DISCUSSION

Phytochemical screening- phytochemical screening of aqueous and alcoholic extract is shown in table-2. The aqueous extract showed the presence of alkaloids, carbohydrate, triterpenoids, saponins, protein, tannin. While alcoholic extract showed the presence of all the phytochemical present in table except steroids and oil.

Table No.-2; Showing the Phytochemical screening of crude extract of *Ficus religiosa*

Phytochemical	Test	Interference (Aqueous)	Interference (Alcoholic)
Alkaloids	Hager's Test	Present	Present
Flavonoids	Alkaline Reagent Test	Absent	
	Shinod's Test	Absent	Present
	Lead Ethanoate Test	Absent	Present

Carbohydrate	Benedicts Test	Present	Present
	Fehling's Test	Present	Present
Triterpenoids	Libermen-bruchards	Present	Present
Saponins	Foam Test	Present	Present
Proteins	Millon's Test	Present	Present
	Biuret's Test	Absent	Present
Tannins	Ferric Chloride Test	Present	Present
	Gelatine Test	Absent	Present
Steroid	Salkowski Test	Absent	Absent
Oil	Stain Test	Absent	Absent

Table No.-3; Showing the Organoleptic Characterization of *Ficus religiosa*

Organoleptic Properties	Aqueous Extract	Alcoholic Extract
Colour	Brownish-black	Light brown
Nature	Fine powder	Granular or brittle with shiny particles
Time taken for extraction	22hr	8hr
Odour	No characteristic odour	No characteristic odour
Taste	Astringent	Astringent

V. CONCLUSION

The obtained result from whole study the validity of the use of *Ficus religiosa* plant as medicine in ancient medicinal traditions. The study showed the presence of different metabolites present in extract of *Ficus religiosa.* The present analytical study carried out discloses the fact that the quantity of phytoconstituents, thickness of bark and extractive value. The study showed, that the both aqueous and alcoholic extracts of all the phytoconstituets to be present qualitatively. The phytochemical analysis carried out reveals the presence of alkaloids, flavonoids, carbohydrate, triterpenoids, tannins and proteins. It does contain any volatile oil, fats, fixed oil, steroids and glycosides. The drug can be used in classical dosage forms like *Kashaya, Hima, Phanta,* and *Churna*. Natural product has always grabbed attention of world in terms of its fewer side effects, cost effective and as better therapeutics.

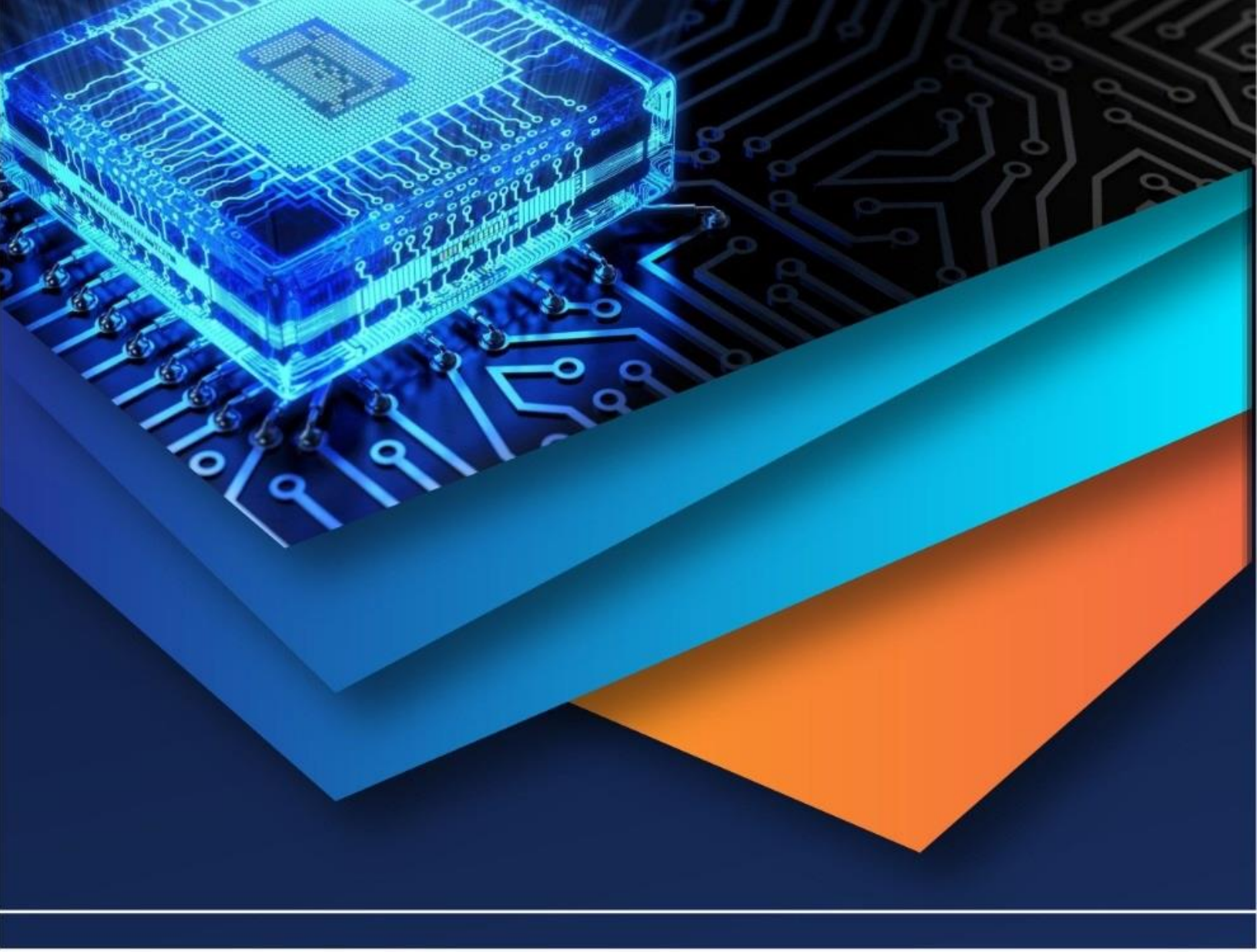
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