



Qualitative Phytochemical Analysis of Some Medicinal Plants (Stem Bark) From Surrounding Area of Talod Taluka, North Gujarat, India

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ABSTRACT

To determine the phytochemical elements, present in medicinal plants, qualitative investigation is critical. The presence of bioactive components in plants confers therapeutic potential. *Manilkara zapota*(L.) van Royen, *Manilkara hexandra*(Roxb.) Dub., *Mangifera indica*L., *Madhuka indica* J.F. Gmel., and *Annona squamosa*L. are the names of the plants. The stem bark of five plants was employed in a qualitative phytochemical investigation. For the extraction of stem bark powder, solvents such as acetone, chloroform, and water were utilised. The presence of different phytochemicals is determined using standard techniques. Alkaloid, Amino acid, Carbohydrate, Protein, Glycoside, Tannin, Terpenoid, Saponin, Flavonoid, and Steroids were qualitatively analysed using the usual protocol. According to the findings of this study, these medicinal plants include a variety of important phytochemicals that help in the therapeutic characteristics of the plants studied, which are widely utilised in Gujarat.

Keywords: - *Qualitative Phytochemical analysis, Manilkara zapota, Manilkara hexandra, Madhuka indica, Mangifera indica, Annona squamosa*

1 INTRODUCTION

Phytochemical screening is the process of isolating various plant ingredients in order to determine their biological activity or therapeutic potential. Plants have medical value because they contain chemical compounds that have a specific physiological function on the living system (Aslam et al., 2009). People in Gujarat have been employing medicinal plants to treat agricultural and human problems since time immemorial. The screening of phytochemicals is the initial step in the production of innovative plant-based pharmaceuticals. The major goal of this research is to identify secondary bioactive compounds found in medicinal plants often utilized in Gujarat.

Fever, bleeding, wounds, and ulcers are treated with *Manilkara zapota* leaf decoction. The flowers are one of the elements of a powder that is applied to a woman's body after she has given birth. The bark is tonic, astringent, and febrifuge. *Manilkara hexandra* is used to treat a variety of ailments. Its bark is particularly effective in the treatment of gum issues and dental ailments such as bleeding gums and gonorrhoea. Fever, gas, stomach problems, jaundice, dental cleanings, and other ailments are treated with the bark.

Madhuka indica has stimulant, demulcent, emollient, heating, skin disorders, rheumatism, headache, laxative, piles, and galactagogue astringent qualities, among others. *Mangifera indica* bark and leaves have astringent characteristics and are used in Nigeria as a toothache treatment. In Cuba, the ethnomedicinal usage of mango stem bark aqueous extract has been well documented. Cancer, diabetes, asthma, infertility, lupus, gastrointestinal diseases, and tooth pain have all been treated with it. The leaves, branches, bark, and roots of *Annona squamosa* have been claimed to have therapeutic effects. They're all astringent and used to cure dysentery and diarrhea. Vermicidal qualities can be found in the green fruits, seeds, and leaves. An infusion of the leaves and fruits is used to alleviate rheumatism and help digestion.

2 MATERIAL AND METHOD

Plant collection and Identification

Manilkara zapota(L.) van Royen, *Manilkara hexandra*(Roxb.) Dub., *Mangifera indica*L., *Madhuka indica* J.F. Gmel., and *Annona squamosa*L. were among the plant species studied. The plants were harvested from the land in the Talod taluka in North Gujarat, India. The washed plant stem bark was kept in for drying after being washed with tap water around 2-3 times to evaporate the water content. With the use of a mechanical blender, the sample was ground into a fine powder after drying. The powder is then kept in an airtight plastic container for future usage with adequate labelling.

Extraction technique

Extraction is the separation of inert plant tissue constituents from medicinally active plant tissue constituents using a conventional extraction process. Menstrum is a selective solvent that is used to eliminate inert material and to obtain the curative part of the procedure through therapy.

Method and Plant extraction

Solvent extraction: -The crude plant extract was made using the Soxhlet extraction method. 10 gm of powdered plant material was placed into a thimble, and 300 ml of solvents were extracted separately. Acetone, chloroform and Water were utilized as solvents. In a syphon tube of an extractor, the extraction process continued for 24 hours until the solvent became colourless. The extract was then placed in a beaker. The extract was then retained and boiled on a hot plate at 30- 40°C until all of the solvent had evaporated. The dried extract was stored at 4°C in a refrigerator for future phytochemical investigation.

Methods of phytochemical analysis

Alkaloid

Wagner's test: -A few drops of Wagner's reagent were applied to 2mg of extract that had been acidified with 1.5 percent v/v hydrochloric acid. The presence of alkaloids is indicated by a yellow or brown ppt.

Carbohydrates

Molisch's test: -2 mg of ethanolic extract was mixed with 10 ml water, filtered, and concentrated. 2ml of conc. sulphuric acid was added to these 2 drops of freshly prepared 20% alcoholic alpha-naphthol solution, forming a layer below the mixture red-violet ring, showing the existence of carbohydrates that disappears when sufficient alkali is added.

Amino acid

Ninhydrin test: -Boil for a few minutes 2 mL Ninhydrin reagent + 2 mL extract. The production of blue colour indicates the presence of amino acids.

Steroids

Salkowski reaction: -2 mg of dry extract was combined with chloroform, To the chloroform layer sulphuric acid was gently introduced by the sides of the test tube. The emergence of a red colour indicated the presence of steroids.

Tannin: -A few drops of a 5 percent w/v FeCl₃ solution were added to 1-2 ml of the ethanolic extract. Gallo tannins are shown by a green colour, whereas pseudo tannins are indicated by a brown colour.

Flavonoids: After mixing 2 mL of each extract with a few drops of 20% sodium hydroxide, a bright yellow colour was seen. A few drops of 70% dilute hydrochloric acid were added to this, and the yellow coloration disappeared. The presence of flavonoids in the sample extract is shown by the formation and disappearance of yellow colour.

Saponins: -6 ml distilled water was added to 2 ml of each extract and rapidly shaken; the presence of saponin is indicated by the production of bubbles or persistent foam.

Proteins: - adding 1 ml of 40 percent sodium hydroxide and a few drops of 1 percent copper sulphate to 2 ml of each extract. The production of violet colour shows the presence of peptide linkage molecules in the sample extract.

Glycosides: - 0.5 ml of glacial acetic acid and 3 drops of 1% aqueous ferric chloride solution added in to 1 ml of each extract. The creation of a brown ring at the interface shows the presence of glycosides in the sample extract.

Terpenoids: - 1 ml of each solvent is mixed with 0.5 ml chloroform and a few drops of strong sulphuric acid to produce a reddish-brown precipitate that confirms the presence of Terpenoid in the extract.

Table-1: - Preliminary Phytochemical analysis

Class of compounds	<i>Manilkara zapota</i>			<i>Manilkara hexandra</i>			<i>Mangifera indica</i>			<i>Madhuka indica</i>			<i>Annona squamosa</i>		
	AE	CE	WE	AE	CE	WE	AE	CE	WE	AE	CE	WE	AE	CE	WE
Alkaloid	+	+	+	+	-	-	-	-	-	-	-	-	+	-	-
Amino acid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbohydrate	+	-	+	+	-	-	+	-	-	-	-	-	-	+	-
Protein	-	-	+	-	-	+	+	-	+	-	-	+	-	-	+
Glycoside	-	-	-	+	-	-	-	-	-	+	-	-	-	-	+
Tannin	+	-	+	+	-	+	+	-	+	-	-	+	+	-	+
Terpenoid	+	-	-	+	-	-	+	-	-	-	-	-	-	-	-
Saponin	-	-	+	-	-	+	-	-	-	-	-	+	-	-	-
Flavonoid	+	-	+	+	-	+	-	-	+	+	-	+	-	-	+
Steroid	+	+	+	+	-	+	+	-	+	+	-	-	-	-	-

Where, '+' = positive and '-' = negative

AE=Acetone extract, CE= Chloroform extract, WE= Water extract

3 Result: -

The phytochemical characteristics of five medicinal plants tested were summarized in table-1. The results revealed the presence of medically active compounds in the five studied plants. From the table, it could be seen that, in *Manilkara zapota* stem bark Acetone extract Alkaloid, Carbohydrate, Tannin, Terpenoid, Flavonoid and steroids are present. In *Manilkara zapota* stem bark chloroform extract Alkaloid and steroid are present. In *Manilkara zapota* stem bark aqueous extract Alkaloid, carbohydrates, protein, Tannin, saponin, flavonoid and steroids are present. In *Manilkara*

hexandra stem bark Acetone extract Alkaloid, Carbohydrate, Glycoside, Tannin, Terpenoid, Flavonoid and steroids are present. In *Manilkara hexandra* stem bark chloroform extracts all the phytochemicals are absent. In *Manilkara hexandra* stem bark aqueous extract Protein, Tannin, Saponin, Flavonoids and Steroids are present. In *Mangifera indica* stem bark Acetone extract Carbohydrate, Protein, Tannin, Terpenoid, and steroids are present. In *Mangifera indica* stem bark chloroform extracts all the phytochemicals are absent. In *Mangifera indica* stem bark aqueous extract Protein, Tannin, Flavonoids and steroids are present. In *Madhuka indica* stem bark Acetone extract Glycoside, Flavonoids and Steroids are present. In *Madhuka indica* stem bark chloroform extracts all the phytochemicals are absent. In *Madhuka indica* stem bark aqueous *Madhuka indica* stem bark Acetone extract Glycoside, Flavonoids and Steroids are present. In *Annona squamosa* stem bark Acetone extract Alkaloid, Glycoside, Tannin present. In *Annona squamosa* stem bark chloroform extract Carbohydrate is present. In *Annona squamosa* stem bark aqueous extract Protein, Tannin and Flavonoids are present.

4 Discussion: -

Saponin's presence indicates that it can be employed as a lipid-lowering drug, as well as having anthelmintic and antibacterial properties. Because Saponin is present, these substances can be utilized as cytotoxic and expectorants by stimulating an upper digestive tract reaction. Tannins are astringents, antioxidants, and free radical scavengers that promote wound healing and are beneficial in peptic ulcers. Tannins also have a reductive property due to the presence of reducing sugar in these plants. Terpenoids may have cardioprotective and antioxidant properties due to their existence. Steroids are often utilized signaling chemicals in biology, and they reduce molecular fluidity. Flavonoids can also suppress the activity of various enzymes involved in free radical formation, such as Xanthine oxidase, Peroxidase, and Nitric oxide synthase, resulting in less oxidative damage to macromolecules. (Mumtaz et al. 2014) Anti-diuretic activity of medicinal plants has been discovered to be aided by alkaloid (Khalid et al. 2018) Glycosides have been shown to reduce blood pressure in numerous studies. (Yadav et al. 2011)

5 Conclusion: -

Finally, the study's overall findings show that all plants contain one or more pharmacologically active constituents. In order to develop medicines that have a promising role in the treatment of dysfunction illnesses, chemical characterization is required to isolate and evaluate active phytoconstituents.

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