International Journal of Pharmaceutical Research and Applications
Volume 9, Issue 6 Nov - Dec 2024, pp: 458-462 www.ijprajournal.com ISSN: 2456-4494

Phytochemical Investigation on Murraya Koenigiileaves

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Date of Submission: 15-11-2024 Date of Acceptance: 25-11-2024

ABSTRACT: Murraya koenigii a staple spice in Indian cuisine, possess remarkable phytochemical and pharmacological properties. Its leaves are collected and dried. Authenticated the leaves. Dried leaves are extracted with alcohol and water in Soxhlet extractor. The extract subjected to various phytochemical tests. Carbohydrates, Protein, Glycosides, Flavanoids, Alkaloids, Tannins, Phenolic compounds andTerpenoids are found to be present in Murraya koenigii leaves.

KEYWORDS: Murraya koenigii leaves, Phytochemical analysis, Organoleptic characters

I. INTRODUCTION

Murraya koenigii, commonly known as curry leaf, is a plant that belongs to the Rutaceae family.[1] It is native to South Asia, particularly found in countries such as Bangladesh, India, and Sri Lanka.[2] Curry leaves are widely recognized for their distinctive fragrance, which is attributed to the presence of volatile oils. These leaves are often used in small quantities as a flavorful spice in various culinary dishes, particularly in Indian cuisine, where they are valued for their ability to enhance the taste and promote digestion.[3]

In addition to their culinary uses, curry leaves have long been incorporated into numerous traditional medicinal practices. Systems such as Ayurveda, Amchi, and other indigenous health traditions in India utilize a wide variety of plants, including Murraya koenigii, to treat a range of ailments in both humans and animals.[4] The medicinal value of curry leaves extends beyond their digestive benefits. One notable application of curry leaves is in hair care. When boiled with coconut oil, the leaves produce an infusion that, after being reduced to a paste-like consistency, is applied to the scalp and hair. This blend is believed to have potent benefits for hair health, acting as a powerful tonic that helps maintain the natural color of hair, stimulates hair growth, and prevents premature graying. The oil extract is also believed to nourish the scalp, reduce hair loss, and promote stronger, healthier hair, making it a staple in traditional hair care remedies. In traditionally the plant is used as a stimulant, stomachic, febrifuge, analgesic and for the treatment of diarrhea, dysentery and insect bites.[8]

They have also been employed to help reduce body heat. In the case of Murraya koenigii (commonly known as curry leaf), its medicinal properties are attributed to the presence of several bioactive compounds, including β-pinene, β-caryophyllene, β-phellandrene, and α-pinene. These compounds have been shown to possess antimicrobial properties, particularly in inhibiting food spoilage, either when used alone or in combination. In addition to its preservative qualities, Murraya koenigii is also valued for its effectiveness in treating a range of health conditions. It has demonstrated notable benefits in managing Type 2 diabetes mellitus by helping to regulate blood sugar levels. The plant is also known for its efficacy in alleviating kidney pain and controlling nausea and vomiting. Beyond its internal uses, Murraya koenigii is also utilized in various traditional remedies for its anti-inflammatory and analgesic effects, offering a natural solution for pain relief and overall health enhancement.[6-7]

The therapeutic properties of plants are largely attributed to the presence of various bioactive compounds, known as phyto-constituents. These compounds, also referred to as secondary metabolites, possess the ability to exert specific physiological and biochemical effects in both humans and animals. Phytochemicals encompass a wide range of chemical classes, including alkaloids, flavonoids, tannins, phenolic compounds, saponins, steroids, glycosides, and terpenoids. These secondary metabolites are not directly involved in the plant's growth or reproduction but play a crucial role in protecting the plant against pathogens, herbivores, and environmental stress. Many of these compounds have been studied for their potential medicinal benefits, with several exhibiting antioxidant, anti-inflammatory, antimicrobial, and anticancer activities, thus forming the basis of traditional and modern herbal medicine.[5]

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In murraya koenigiithe presence of β-pinene, β-caryophyllene, β- phellandrene and α-pinene has ability to control the food spoilage either alone or by combination.[9]It is very effective against diabetics Mellitus, kidney pains and vomiting.[10-11]Properties like blood purification, antifungal, anti-inflammatory, against body ache and antibacterial etc are very well known.[12-13]

II. AIM

The aim of the study was to collect Murraya koenigii leaves and to perform systematic phytochemical analysis on the aqueous alcholoic extract of dried leaves.

III. MATERIAL AND METHODOLOGY

Green leaves plucked from our campus garden and authenticated at State Medicinal plantboardKeralabySeniorscientist.Organolepticcharactersareobservedandnoted.The leaves picture is incorporated in figure (no:01). The collected leaves washed in running water to remove any organic foreign particle if present. Dried in shade and pulverized in pulverizer of the laboratory. The coarse powder 07 gm subjected to Soxhlet extraction using aqueous alcoholic solvent at 40^0C for six hrs. The obtained extract concentrated by simple evaporation at 40^0C. % yield = (weight of dry extract / weight of plant powder)×100 determined. Various phytochemical tests performed on the extract as follows.

Fig no:01-Murraya koenigii

Fig no:02-Soxhlet Extraction

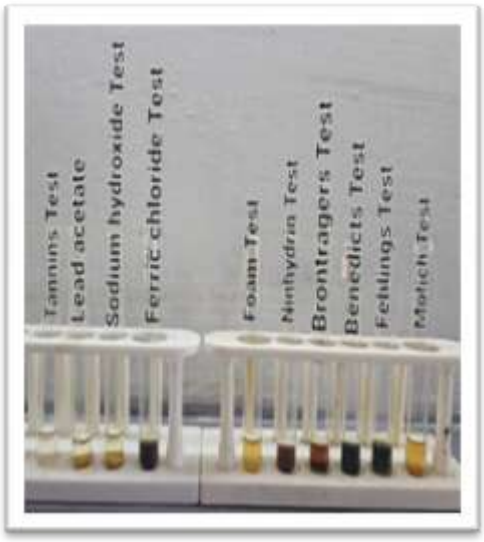

Fig no:03-Chemical Tests

Test for Carbohydrates

Molisch's Test: 2-3drops of Molisch's reagent were added to 2Ml of plant extract. Violetring formation indicates the presence of carbohydrates.

Fehling's Test: Mix equal volume of Fehling's solution A and B, boil for 1minute and add equal volume of extract. Heat in a boiling water bath for 5-10minutes. Brick red precipitate formation is the indication of presence of carbohydrates.

Benedict's Test: To 5ml of Benedict's reagent, 1ml of extract solution was added and boiled for two minutes and cooled. Red precipitate indicates the presence of carbohydrates.

Testfor Proteins

Millon's Test: Few drops of Millon's reagent were added to 2mL of the plant extract. The appearance

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of white precipitate reports the presence of the proteins.

Biuret Test: To3ml of extract solution add 4%sodium hydroxide and few drops of1%coppersulphate solution. Violet colour indicates the presence of proteins.

Ninhydrin Test: 3ml of extract solution was heated with 3drops of 5% ninhydrin solution in a boiling water bath for10minutes. Purple colour indicates the presence of proteins.

Test for Glycosides

Legal Test: The extract was dissolved in pyridine and sodium nitroprusside was added to make it alkaline. Pink red to red colour indicates the presence of glycosides.

Killer–killiani Test: To2ml of extract, glacial acetic acid, one drop of 5% ferric chloride were added. Reddish brown at the junction of two liquid layers. Bluish green colour in the upper layer shows the presence of glycosides.

Borntrager's Test: A few ml of dilute sulphuric acid was added to 3ml of extract solution. It was then heated, filtered. To the solid filtrate, added equal volume of benzene and chloroform. The chloroform layer was then treated with1ml of ammonia. Red colour indicates the presence of anthraquin one glycosides.

Test for Saponins

Foam Test: The extract was vigorously shaken with water. Persistent foam indicates the presence of saponins.

Test for Flavonoids

Sodium hydroxide Test: To 1mL of plant extract 3mL of 2% of NaOH was added, a yellow color appears. Then add few drops of dilute H_2SO_4 solution to it. It turns colourless showing the presence of the flavonoids.

Lead acetate Test: A fraction of extract was treated few drops of 10% of lead acetate. Yellow precipitate indicates the presence of the flavonoids.

Test for Alkaloids

Dragendroff's Test: A fraction of extract was treated with Dragendroff's reagent and observed for formation of yellow coloured precipitate.

Mayer's Test: 2-3 drops of Mayer's reagent was added to 1 mL of plant extract. White creamy precipitates show the presence of the alkaloids.

Wagner's Test: A fraction of extract was treated with Wagner's reagent. Reddish brown precipitate indicates presence of alkaloids.

Hager's Test: Add few drops of Hager's reagent in to 1mLextractofplant.Yellowprecipitatesindicate presence of alkaloids.

Test for Tannin

Lead acetate Test: A fraction of extract was treated with few drops of lead acetate solution. White precipitate shows presence of tannins.

Sl.No	Chemical Tests	+/-
01	Test for Carbohydrates	+++
02	Test for Proteins	++
03	Test for Glycosides	+++
04	Test for Saponins	-
05	Test for Flavonoids	+++
06	Test for Alkaloids	+
07	Test for Tannins	++
08	Test for Phenolic compounds	++
09	Test for Steroids	-
10	Test for Terpenoids	++

Test for Phenolic compounds

Ferric chloride Test: To extract solution add few ml of 5% ferricchloride solution was added. Formation of black colour indicates the presence of phenolic compounds.

Folin Ciocalteu Test: Add 2mL of plant extract and 1 mL of Folin Ciocalteu reagent, if blue green colour appears thenthe extract reports the presence of phenols init.

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TestforSteroids

Libermann Burchard's Test: 1mL of plant extract, mixed with 2-3 mL acetic anhydride andconc. sulfuric acid (side by side of the test tube) were added. Violet or green coloration shows the presence of steroids.

Salkowaski's Test: Take 2 mL of the plant extract and shake with the chloroform, then addconc. sulfuric acid from the side wall of the test tube. Red color indicates the presence of steroids.

Test for Terpenoids

Copper acetate Test: To 2mL of the plant extract, 1-2 drops of copper acetate were added inthetest tube. Green precipitates suggest the presence of the terpenoids.

IV. RESULTS AND DISSCUSSION

Organoleptic characteristics:

Color- Dark green,

Odour- Aromatic.

% yield of crude extract=5.3 /7.0×100 =75% w/w

V. CONCLUSION

The yield was good. The important phytoconstituents present in Murraya koenigii leaves are Carbohydrates, Glycosides, Flavonoids, Alkaloids, Proteins, Tannin, Phenolic compounds and Terpenoids. Abundant presence of Carbohydrates, Proteins, Glycosides, Flavonoids, Tannin, Phenolic compounds, and Terpenoids are shown.

The result showed the active constituents abundantly present may exhibit certain medicinal properties. Total quantity of the active constituents must be determined, and active constituents should be isolated and should subject for screening of various medicinal properties may lead to medicinally significant led molecules.

ACKNOWLEDGEMENT

The authors are thankful to the authorities of Holy Queen College of Pharmaceutical Sciences and Research for the provided facilities and chemicals.

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