Case Report

World J Curr Med Pharm Res. 2021;3(4): 104-106

WORLD JOURNAL OF CURRENT MEDICAL AND PHARMACEUTICAL RESEARCH

www.wjcmpr.com ISSN: 2582-0222

Phytopharmaceutical profile of Ficus thonningii : An updated Review

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Abstract

Ficus thonningii is a plant that is widely utilised in African ethnomedicine to cure a variety of ailments. a rational examination of F. thonningii's nutritional, phytochemical, and pharmacological characteristics in connection to its medicinal uses.Alkaloids, terpenoids, flavonoids, tannins, and active proteins are among the bioactive components found in Ficus thonningii, all of which contribute to its therapeutic qualities.Continue to discover, isolate, and quantify the active components, as well as establish the processes behind its curative powers.

Article History:
Received on: 25.06.2021
Revised on: 18.06.2021
Accepted on: 31.08.2021

Keywords:
Ficus thonningii, phytochemical, toxicity.

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DOI: https://doi.org/10.37022/wjcmpr.v3i4.188

Introduction

Ficus thonningii (Blume) is a Moraceae family tree.F. thonningii is generally known as common wild fig, but it is also known as 'odan' by the Yoruba tribe of Nigeria, and it is used ethnobotanically to cure a variety of illnesses and ailments [1]. The tree is well-known for its medicinal qualities, which are used to cure a variety of ailments. The leaves of F. thonningii are high in protein.F. thonningii leaves have a protein concentration of 18.7-20.5g/100 g dry matter (DM) [2]. F. thonningii also has a high calcium content, with 180.05 mg/100 g dry weight [4] compared to 118 mg/100 ml in bovine milk. Potassium concentrations vary from 0.91 to 1.25 g/100 g dry weight, whereas magnesium concentrations range from 260 to 357.2 mg/100 g dry weight [3].

Local Names

Afrikaans (gewone wurgvy); Arabic (jammeiz al abiad); English (strangler fig,common wild fig,bark-cloth fig); French (India-laurel fig); Fula (bikeshi); Hausa (chediya); Shona (gerina); Spanish (Laurel,álamo jagüey,Arbol de Washington); Swahili (mtschamwa,mrumbapori); Tigrigna (shibaka); Yoruba (odan); Zulu (umBombe).

Phytochemical composition

F. thonningii includes a variety of physiologically active chemicals with physiological effects that may account for its healing potential in a variety of diseases. The tree produces these non-nutritive compounds, known as phytochemicals, as a natural defence against biotic and abiotic stressors. For phytochemical screening in F. thonningii, most studies utilised conventional qualitative techniques. Without measuring the particular bioactive molecule, qualitative techniques may only validate the presence or absence of a class of chemicals. The isolation and quantification of particular chemicals identified in F. thonningii has received little attention. Alkaloids, terpenoids, flavonoids, tannins, and essential oils are the major categories of phytochemicals identified from F. thonningii.

Essential oils

Essential oils found in the leaves of F. thonningii include 6, 10, 14 trimethyl-2-pentadecanone (18.8%), phytol (14.7%), acorenone (7.6%), and -gurjunene (6.3 %)4.

Flavonoids

Flavonoids were discovered in different plant sections of F. thonningii, and they were utilised as a biomarker to determine Ficus species variation.The presence of flavone-C-glycosides in F. thonningii leaves was discovered, and they were identified as orientin, vitexin, and isovitexin. F. thonningii was the only Ficus species that contains stilbenes, which were identified as resveratrol, resveratrol glucosides, and stilbene glucosides, among the Ficus species included in this phylogenetic analysis.Stilbenes are a kind of flavonoid that plants generate in response to infections and other abiotic stressors like UV radiation [5-6].

Tannins

Tannin concentrations in F. thonningii leaves were assessed dry matter using the vanillin assay.The presence of tannins in methanolic, n-butanolic, and aqueous extracts of F. thonningii leaves was verified by the ferric chloride and tannic acid tests7.

Alkaloids: Alkaloids are nitrogen-containing molecules with a low molecular weight that exhibit extraordinary physiological effects. As a result, they've been used as medicines, stimulants, and narcotics).Alkaloids are found in F. thonningii [8-9].

Other phytochemicals

Phytate and oxalate are two phytochemicals found in F. thonningii that have antinutritional effects. Despite the presence of antinutritional elements, F. thonningii leaves have a high feed value, as shown by their palatability and digestibility when used as fodder.Other secondary metabolites found in F. thonningii leaves include lignins, lignans, active carbohydrates, and proteins [8].

Terpenoids

Squalene is converted into triterpenoids, which generate a variety of pharmacologically active compounds such as steroids, saponins, and cardiac glycosides. Saponins and anthraquinone glycosides have been found in F. thonningii stem bark extracts (Saponin concentrations in F. thonningii leaves have been reported to be as high as 300 mg/100 g dry matter).The Moraceae family has a lot of cardiac glycosides, which are found in abundance in the F. religiosa [9-10].

Quinones

Quinones are colourful, highly reactive chemicals that have two ketone replacements in the aromatic ring. They come in the form of di-ketones (quinones) or di-phenols (hydroquinone).They have antimicrobial action by creating an irreversible compound with nucleophilic amino acids in their proteins [11].

Coumarins

Coumarins are phenolic compounds made up of benzene and -pyrone rings bonded together. They have a distinct odour and have been proven to have antibacterial properties against bacteria, fungi, and viruses [12].

Enzymes

Enzymes are bioactive substances found in medicinal plants, and some have antimicrobial characteristics, such as papain, a proteolytic enzyme derived from Carica papaya's milky sap with bacteriostatic properties.

Qualitative phytochemical screening

It was carried out on the crushed leaves using the specified standard procedures [13].

Alkaloids

5 mL of 0.1N HCL was used to heat one grimmer of dried powdered leaves and stem bark. Each filtrate was split into two equal halves. Five drops of Dragendorff's reagent were applied to the first part, while Wagner's reagent was added drop by drop to the second portion. Any changes were reported in any of the sections.

Terpenoids (Salkowski test)

2 mL chloroform was applied to 0.5 g of the sample. A coating of concentrated sulphuric acid (3 mL) was carefully applied. The presence of terpenoids is indicated by a reddish brown colour of the interface.

Tannins

20 mL water was added to 1 g of powdered material, heated, and filtered. Water was used to dilute the filtrate to 20 mL.

1. A millilitre of the adjusted solution was brought up to 5 mL with water, and a few drops of ferric chloride solution (0.1 percent w/v) were added.
2. To another 1 mL of the corrected solution, two drops of bromine water were added. Changes in colour or the development of precipitate have been observed..

Flavonoids

The 5 g powdered material was extracted and filtered with 10 mL methanol. A tiny amount of magnesium powder and three drops of strong hydrochloric acid were added to the filtrate. It was noticed that the colour had changed.

Glycosides Test

1 gm. of powdered material was heated in 10 mL of 80 percent v/v ethanol for 5 minutes before being filtered. An equal amount of water and a few drops of lead acetate were added to the filtrate. The filtrate was then extracted with chloroform, which was then evaporated and the residue was recovered. In a test tube, 3 mL ferric chloride reagent (0.3 mL of 10% v/v ferric chloride in 50 mL glacial acetic acid) was added to the residual.2 mL concentrated sulphuric acid was used with caution. The colour of the contact was recorded when the liquid was poured through the tube.

Test for phenols

1g of plant material was extracted using ethyl acetate. After that, the extract was filtered using Whatman filter paper. The presence of phenol is shown by the formation of a blue black or brown colour in the filtrate after adding ferric chloride reagent.

Table 01: Phytochemical constituents of crude leaf extracts of F. thonningii {(-) = absent,(+) = low,(++) = high,(+++) = very high,}

Phytoconstituent	Aqueous extract	Methanolic extract
Anthraquinones	+	+
Flavonoids	+	++
Alkaloids	-	+
Terpenoids	-	++
steroids	-	++
Saponins	++	+

Conclusion

During a qualitative phytochemical screening of F. thonningii leaves, researchers found the presence of alkaloids, tannins, anthraquinones, terpenoids (steroids), flavonoids, and saponins. These phytochemicals may be responsible for F. thonningii's broad pharmacological activity, which explains why it is used for so many different therapeutic reasons. In this qualitative study, the intensity of colour development in the detection of terpenoids, flavonoids, and alkaloids was higher in methanolic extracts than in aqueous extracts.

Disclosure Statement

There are no conflicts of interest.

Acknowledgment

It's our privilege to express profound sense of gratitude and cordial thanks to our respected chairman Mr. Anil Chopra, Vice Chairperson Ms. Sangeeta Chopra & Pro-Chairman Mr. Prince Chopra, St. Soldier Educational Society, Jalandhar for providing the necessary facilities to complete this work.

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