Comparative Study of Phytochemical Analysis of Leaves And Roots of Persea Americana

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Abstract- *Medicinal plants are known as the "old as mankind on earth". They are useful to treat many diseases. Many bioactive compounds are present in the plants that has physiological activity against illness. The present study aims to determine the phytochemical constituents of ethanolic leaf and root extract of Persea americana. Persea americana (Lauraceae) plant is a semi ever green grown up to 65 feet that produces alligator pear fruit. The fruit is edible; after consumption the seed is discarded the fruit has received some scientific scrunity. The plant parts are very effective against hyper-tension, inflammation, cancer, wounds and many other diseases. The phytochemical analysis was done by performing standard tests for various phytochemical constituents. Phytpchemicals are the bioactive compounds, present as in chemical forms. These compounds are present in medicinal plants against mainly diseases like diabetes, malaria, cold and etc. The study revealed rich presence of majority of phytochemical constituents which can be correlated with the possible significant medicinal potential of the plant.*

Keywords- bioactive compounds, lauraceae, Persea americana, phytochemicals.

I. INTRODUCTION

Medicinal plants are used by mankind since the beginning because of its high therapeutic value. Plant based medicinal systems play a crucial role in the human's life. Approximately 80% of the world's population depends on the traditional medicines for their primary health care [1]. Medicinal plants have a different ability to synthesize a variety of chemical compounds that perform important functions to defend against pathogenic microorganisms. Almost 12,000 such compounds are isolated from a number estimated to be less than 10% of the total. The plant parts such as leaves, seeds, fruits, barks, roots are used as medicine for various kinds of diseases [2].

In India, most of the people use plants as medicines which is an ancient practice. India has an incredible source of medicinal plants in the region of eastern Himalayas, Western Ghats and Andaman and Nicobar Island. The officially documented plants with medicinal potential are 3000 but traditional practitioners use more than 6000 species [3]. India is considered as the 'botanical garden of the world' due the largest production of medicinal herbs. In India, Ayurvedic form of medicine is being practiced for thousands of years back. The common medicinal plants seen in India are *Osimum santum, Curcuma longa, Aloe barbadenis, Commiphora wighitti,* and *Bacopa monnieri* [4].

Phytochemicals are the biologically active compounds present in plants. The important compounds are the alkaloids, carbohydrates, tannins, saponins, steroids and glycosides. Phytochemicals are the natural defence system in plant against host plant and also provide colour, flavour and aroma. The natural products play an important role in the drug discovery and development. Hence, it is essential to study the pharmacologically valuable aspects of these medicinal plants [5].*Persea americana* isbelongs to the Lauraceae family and it is commonly called as "avocado". In the Western areas of India like Maharashtra, Karnataka, Tamilnadu, Kerala are the big cultivators of the plant and they are used this for various purposes. This plant is a rich source of polyphenolic compounds [6]. The present study aims to investigate the phytochemicals of the ethanolic extract of both root and leaves of *Persea americana*.

II. MATERIALS AND METHODS

COLLECTION OF PLANT

Healthy fresh leaves and roots of *Persea americana* were collected from Wayanad District of Kerala. The plant leaves and roots were cleaned and after that air-dried for 3 weeks and coarsely powdered and stored in air tight bags in a cool place.

EXTRACT PREPARATION

Using soxhlet apparatus, the root and leaf extract were prepared, by adding 30g of powder in 150 ml of ethanol.

PHYTOCHEMICAL ANALYSIS

The ethanolic extracts were subjected to preliminary phytochemical analysis in order to detect the presence of various types of phytoconstituents like alkaloids, flavonoids, tannins, phenolic compounds, carbohydrates proteins, amino acids and glycosides. [7].

1) **DETECTON OF ALKALOIDS:-** Extracts were dissolved in dilute hydrochloric acid and filtered.

   a) **Wagner's test:** 2 ml of filtrate were treated with Wagner's reagent (Iodine in potassium iodide).

   b) **Hager's test:** 2 ml of filtrate were treated with Hager's reagent (saturated sulphuric acid solution).

2) **DETECTION OF CARBOHYDRATES:-**Extracts were dissolved individually in 5ml distilled water and filtered. The filtrates were used to the presence of the carbohydrates.

   a) **Molisch's test:** 2 ml of filtrates were treated with two drops of alcoholic alpha-naphthol solution in a test tube.

   b) **Benedict's test:** 2ml of filtrates were treated with Benedict's reagent and heated gently.

c)Fehling's test: Small portion of the filtrate were hydrolysed with dilute hydrochloric acid neutralised with alkali and heated with Fehling's A and B solutions.

3) **TEST FOR SAPONINS:-**

   a) **Froth Test:** Extracts were diluted with distilled water to 20ml and this was shaken in a graduated cylinder for 15 minutes.

   b) **Foam test:** Extracts were shaken with 2ml of water.

4) **DETECTION OF PHYTOSTEROLS:-**

a) Salkowski's test: Extract were treated with chloroform and filtered. The filtrates were treated with few drops of concentrated sulphuric acid, shaken and allowed to stand.

b)Libermann Burchard's test: 2ml of the extract were treated with chloroform and filtered. The filtrates were treated with 2 ml of acetic anhydride, boiled and cooled. 2 drops of concentrated sulphuric acid was added.

5)DETECTION OF FLAVONOIDS:-

a) Alkaline reagent Test: Test solution when treated with sodium hydroxide solution, shows increase in the intensity of yellow colour which would become colourless on addition of few drops of dilute hydrochloric acid.

b) Lead acetate solution Test: Test solution when treated with few drops of lead acetate (10%) solution.

6)DETECTION OF TANNINS:-

Gelatin Test: To small quantity of test solution when treated with 1% gelatin solution.

7) DETECTION OF PHENOLS:-

   a) **Ferric Chloride Test:** To 2 ml of the extract,1ml of neutral 5% ferric chloride solution were added.

   c) **Lead Acetate Test:** To the extract, 3 ml of 10% lead acetate solution was added.

8)DETECTION OF GLYCOSIDES:- Extracts were hydrolysed with dilute HCl, and then subjected to test for glycosides.

Modified Borntranger's test: To 5ml of the extract, added 5ml of 5% Ferric chloride solution and immersed in boiling water for about 5 minutes. The mixture was cooled and extracted with equal volume of benzene. The benzene layer was separated and treated with diluted ammonia solution.

9) DETECTION OF PROTEINS AND AMINOACIDS:-

a) Xanthoproteic test: 3 ml of the extract was treated with few drops of concentrated nitric acid and heated for some time.

c) Ninhydrin test: To 3ml of the extract, 3dops of 0.25% ninhydrin reagent was added and boiled for few minutes.

10) DETECTION OF DITERPENES:-

a) Copper acetate test: Extracts were dissolved in water and treated with 3 to 4 drops of copper acetate solution.

III. RESULT AND DISCUSSION

The results of phytochemical analysis of *Persea americana* clearly shows that the presence of various phytocostituents like alkaloids, carbohydrates, saponins,

phytosterols, flavonoids tannins, phenols, amino acids, proteins and diterpenes.

TEST	LEAF	ROOT
Alkaloids	++	++
Carbohydrates	++	--
Saponins	++	++
Phytosterols	++	--
Flavonoids	++	++
Tannins	++	++
Phenols	++	++
Glycosides	--	--
Proteins	++	--
Amino acids	++	--
Diterpenes	++	++

(++: highly present, --: absent)

From the table the plant root and leaf equally contains alkaloids indicates the presence of analgesics and antibacterial effect of the plant [8]. The plants require energy for their actions so that is from the storage form of energy carbohydrates. The plant leaves contain carbohydrates and the same plant root does not contain the carbohydrates as much. The general property of saponins are the formation of foams in aqueous and that shows the potent haemolytic and cholesterol binding properties [9] [10]. Phytosterols are the compounds that are similar to cholesterol. The increased concentration of the phytosterols indicates that the plant having high cholesterol lowering capacity [11]. The study [12] [13] states that flavanoids synthesized in response to microbial attack. The tannins present in the plant indicates that the polyphenols present in the plants. That also indicates the antioxidant and antimicrobial properties of the plant [14]. The above table shows that the plant extract gives positive result for phenols. Both leaf and root extracts contains the phenol content which [15] indicates an important role in cancer prevention. Several studies are followed but there is no clear evidence for the presence of glycosides in both extracts [16]. The presence of Proteins and amino acids indicates the high nutritional activity of the plant [17]. The terpenes present in the plant mainly used in the treatment of vascular and inflammatory diseases [18].

IV. CONCLUSION

The present study reveals that the roots and leaves of Persea americana is an important source of phytochemical constituents having medicinal properties

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