

Original Research Article

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Phytochemical Screening of Leaf Extracts of *Azadirachta indica* and *Psidium guajava*

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ABSTRACT

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The aim of this study was to evaluate the phytochemical compounds from the prepared herbal extracts. Screening of alkaloids, flavonoids, tannins, carbohydrate and saponin from quantitative and qualitative experiments was performed by using standard methods. Result showed the presence of alkaloid, tannin, saponin, flavonoid, carbohydrate and glycoside in both the studied herbal plants. In *Psidium guajava*, tannin and alkaloid were found more in the acetone extracts while in *A. indica* carbohydrate and glycoside were found more in the hydromethanolic extract. Flavanoid and glycoside were present in more quantities in *A. indica* whereas saponin, tannin, carbohydrate and alkaloid were present in high concentration in *P. guajava*. The results are suggestive that leaf extract of *P. guajava* showed more antioxidant potential as compared to *A. indica*. The leaf extracts showed the highest antioxidant potential in hydromethanolic extract followed by the acetone and aqueous extract. Total phenol and flavonoids are positively correlated with antioxidant potential.

Introduction

Medical Plant constitutes therapeutic effect in alleviating ailments in humans and animals. Almost 80% of the world populations are fully dependant on herbal medicines because of awareness about side effects and toxicity accumulation in organs (Bukata *et al.*, 2016). The herbal medicines today symbolize safe and surety in contrast to the synthetics that are regarded as unsafe to human and environment. The World Health Organization (WHO) has outlined herbal medicine as culminated labelled medicinal products that

incorporate lively ingredients as aerial or underground accessories of plants or other plant fabric (Romila *et al.*, 2010).

Azadirachta indica commonly called as Neem, has become important in the global context today because it offers answers to the major concerns facing mankind. It is a fast-growing evergreen popular tree found commonly in India, Africa and America. Neem is most important medicinal plant that have been used as a general folk medicine, and more recently, its constituents have been purified and found to possess greater

antioxidant, hepatoprotective, antimicrobial, and anticancerous activities (Harway *et al.*, 2013). Moreover, its constituents also show therapeutic implications in the modulation of cell signaling pathways involved in the management of cancer. The *Azadirachta indica* leaves are greatly used among the quite a lot of tribes of India to remedy cuts, wounds and different minor dermis illnesses (Padal *et al.*, 2013).

Psidium guajava (common name-guava) is well known tropic tree belongs to phylum Magnoliophyta, class Magnoliopsida and Myrtaceae family has been extensive use in folk medicine (Nasser & Naeem, 2018) Different parts of the plant can be used in the treatment of diseases such as wounds, lesions, ulcers, diarrhea, cholera, hypertension, obesity and the control of diabetes mellitus. Guava leaves have been used to treat cough and pulmonary diseases, diarrhea, malaria and dysentery, sore throats, vomiting and menstrual complications. Tender leaves are chewed for bleeding gum and bad breath. Natural products play a consequential role in the field of new drugs research and development because of their long history of safety profile, availability and reasonable cheapness. They also represented the most productive source of lead compounds, which are involved in the optimization strategies of drug design. Phytochemicals produced by all plants repositories which has some medicinal uses. During the past few decades, the pharmaceutical industry conducted research on the phytochemical agents to discover potent drug against different ailment (Arika *et al.*, 2015). The beneficial roles of phytochemicals are their less toxicity, low cost, easy availability and biological significance such as antioxidant potential, antimicrobial effects, stimulation of the immune system and many more (Ramadass and Subramanian, 2018).

The aim of this study was to determine the bioactive compounds present in the *Psidium guajava* (Linn) and *Azadirachta indica* leaves extract with the aid of quantitative techniques, which may provide an insight in its use in tradition medicine.

Materials and Methods

Collection of Plant material

Fresh leaves of *Azadirachta indica* was procured from district Durg of Chhattisgarh state and nearby areas. The leaves of *Psidium guajava* and *Azadirachta indica* were washed under running tap water and dust was removed from the leaves. The leaves were dried at shaded places for 15 days and coarsely powdered.

Preparation of extract

Five gram of grinded powder had been percolated with one 200 ml of solvent (Aqueous, Aquamethanol and Acetone) for extraction and kept at soxhlet 150° C temperature for 36 hours. The extracts were filtered before drying using Whatman filter paper no.1 on a Buchner funnel and the solvent was removed by vacuum distillation in a rotary evaporator at 40°C; the extracts were placed in pre-weighed flasks before drying. Finally the extracts of *A.indica* and *Psidium guajava* leaves were used for the phytochemical screening. Qualitative Phytochemical Screening

Extracts were tested for the presence of alkaloids as per method given by Evans (1997) and Wagner (1993).

Test for Alkaloids: 2ml of each extract was mixed with 0.2ml of diluted HCL solution. Then 1ml of Wagner's reagent was added (1.27 g of iodine and 2g potassium iodide along with 100ml distilled water). Positive

test is confirmed by reddish brown precipitate.

Test for Tannins: 2ml of each extract mixed with few drops of 5% ferric chloride solution. Formation blue colour indicates the presence of tannins.

Test for Saponins: 5ml of each extract shaken vigorously with 5ml of distilled water in a test tube and warmed. Formation of stable foam indicated the test as positive.

Test for Flavonoids: 1ml of each extract mixed with 1ml of 10% lead acetate solution. Formation of yellow precipitate indicated the test as positive.

Test for Glycosides: 2ml of each extract was dissolved in glacial acetic acid and 5% ferric chloride solution was added. The contents were heated and cooled then transferred to a

test tube containing 2ml concentrated sulphuric acid. Pale green colour appears in upper layer that indicates the presence of glycoside.

Results and Discussion

The pharmaceutical importance and medicinal values of the medicinal plants are in the bioactive phytochemical metabolites that produce specific physiological action. The most important bioactive plant constituents are saponins, flavonoids, and alkaloid (Oyenihi and Smith, 2019). The Phytochemical test was conducted to determine the presence of active chemical constituents in *Azadirachta indica* and *Psidium guajava* leaves extracts prepared in different solvents. The phytochemical analysis of extracts, aqueous, aqueous methanolic and acetone was presented in Showed in table 1.

Table.1 Qualitative phytochemical analysis of dried *Psidium guajava* and *Azadirachta indica* leaf extracts

| Particulars | Aqueous extract | | Aqueous methanolic extract | | Acetone extract | |
|-------------------|------------------------|---------------------------|----------------------------|---------------------------|------------------------|---------------------------|
| | <i>Psidium guajava</i> | <i>Azadirachta indica</i> | <i>Psidium guajava</i> | <i>Azadirachta indica</i> | <i>Psidium guajava</i> | <i>Azadirachta indica</i> |
| Alkaloids | + | ++ | ++ | +++ | +++ | + |
| Tannins | ++ | + | ++ | + | +++ | + |
| Saponins | ++ | ++ | ++ | ++ | + | - |
| Flavonoids | + | + | +++ | ++ | + | + |
| Glycosides | + | + | ++ | ++ | + | + |

Absent, + Less concentration, ++ Moderate concentration, +++ High concentration

The acetone extract of *Psidium guajava* shows the maximum concentration of alkaloids and tannins and very less concentration of flavanoids and glycosides. Aqueous extract mainly contains saponins and tannins in moderate concentration where as Aqueous methanolic extract contains highest concentration of flavonoids and moderate concentration of alkaloids, tannins, saponis

and glycosides. Similar findings were observed by Ekeleme *et al.*, (2017)

The present study results with the Aqueous methanolic extract of *Azadirachta indica* contains moderate amount of saponins, favonoids and glycosides. Alkaloids are present in highest concentration in aqueous methnolic extract whereas moderate

concentration in aqueous extract and tannin is very less in all the studied extracts. The high percentage of compounds that were identified in the crude extract is chemically and biologically important. The results of Priyanka *et al.*, (2017) suggested that the *Azadirachta indica* extracts contain different phytochemicals with anti-inflammatory, antidiabetic, antimicrobial, and antioxidant properties. Phytochemical analysis of guava leaf contains alkaloids, contains, plenty of phenolic compounds which inhibit the peroxidation reaction in the body and so it can be expected to prevent various chronic diseases like diabetes, cancer cardiovascular affections. Furthermore, decreasing of free radicals in the body by means that the polyphenols in the leaf of *P. guajava* can prevent atherosclerosis, cataract and also inhibits biological aging of the body and skin

Phenolic compounds are known as powerful chain breaking antioxidants, and are important in the quenching of free radicals thereby contribute directly to antioxidative action (Aghraj *et al.*, 2018). Phenolic hydroxyl groups are the hydrogen donors and can react with reactive oxygen species in a termination reaction, stabilize the free radical and prevent the generation of new radicals (Valentao *et al.*, 2003).

A number of studies have shown that plant polyphenols can be used as antioxidants against different oxidative stress-induced diseases (Boo, 2019). Thus, antioxidant compounds such as plant polyphenols have been suggested that they may be used for the prevention and/or treatment of this disease. (Jin *et al.*, 2018). Studies of Sahrawat *et al.*, (2018) reported the antimicrobial efficacy of *Azadirachta indica* leaves due to presence of alkaloids, flavonoids and glycosides in aquamethanolic extract of both the studied herbal formulations. The protective effect of phytochemicals bearing antioxidant, anti-

inflammatory, antimicrobial, properties against various ailments has been attributed by the presence of phytochemicals (Mastuura and Fett-Neto, 2015).

In conclusion the phytochemical and biochemical experiments performed during the current study confirm that the extracts of the plant are rich in chlorophyll and proline. Methanolic extracts showed the presence of some common phytochemicals like alkaloids, saponins, tannins, glycosides, flavonoids and reducing sugars. Traditionally used by many people as an alternative treatment for a variety of health ailments and skin irritations. Commonly reported plant species need to be tested and validated their active ingredients in order to recommend effective preparations and treatments.

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