



Preliminary screening of phytochemical evaluation selected plant of *Pisonia alba*

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Abstract

The present study was carried out to analyze the phytochemical profile of leaves of *Pisonia alba*. The leaves powder was successively extracted with polar, non polar and dipolar solvents like, chloroform, ethanol, ethyl acetate, acetone, benzene phytochemical analysis shows the presence of flavonoids, tannin triterpenoids, saponins, sterols, alkaloids and carbohydrates. The result of the study could be useful for description and foundation of a monograph of the plant. It is preliminary screening for quality analysis. Primary phytochemical evaluations is mainly identify secondary metabolites from plant extracts.

Keywords: *pisonia alba*, phytochemical profile, solvents, extracts, quality analysis

Introduction

Plants are important source of drugs; especially in traditional medicine (Bako *et al.*, 2005) [5]. It is a common practice in Nigeria and other parts of the world to use the plant in the form of crude extracts, decoction, infusion or tincture to treat common infection and chronic conditions. According to WHO, over 70 % of the world populations rely on medicinal plants for primary health care (WHO, 2008) [6]. Quality can be defined as the status of a drug that is determined by identity, purity, content and other chemical, physical, or biological properties, or by the manufacturing processes. Quality control is a term that refers to processes involved in sustaining the quality and validity of a manufactured product. For the quality control of a traditional medicine, the traditional methods are procured and studied, and documents and the traditional information about the identity and quality assessment are interpreted in terms of modern assessment (Vikrant Arya *et al.*, 2012) [1]. Most of the drugs employed in the treatment of human ailments are obtained by extraction, either by an infusion, using water, natural gain of local wine as solvents (Acharya *et al.*, 2008) [7]. However, it is important to make a good selection of the solvent in the study of activities of plant constituents or active ingredients. In recent days, scientific and technological advancement have made it possible for the investigation of a large number of medicinal plants by employing a systematic screening method using chromatographic techniques and spectroscopic techniques to establish the actual effects (Harbone J.B, 1998) [8]. Medicinal plants are a significant source of producing compounds which are great importance for the health of individuals and communities. Medicine standards of the plants are due to the compounds that produce a definite physiological action on human body and are called chemical constituents. Free radicals are associated with several diseases including cancer, diabetes mellitus, and arthritis, ageing and liver disorder. Plants constitute of various natural products that are important form medicinal point of view (Shah *et al.*, 2012; Uddin *et al.*, 2011; Shah *et al.*, 2012) [4]. Natural antioxidants

such as flavonoids, tannins and phenols are increasingly attracting because they are disease preventing, health promoting and anti aging substances. (Farnsworth and Soejarto, 1991) [9]. the phytochemical research based on ethnopharmacological information is generally considered an effective approach to the discovery of new effective agents from plant extracts it is used to identify secondary metabolites.

Materials and Methods

Collection and identification of plant materials

The leaf of a healthy plant *Pisonai alba* was collected from local areas of near to Annamalai University, Cuddalore, Tamil Nadu, India.

Preparation of plant extracts

These leaves were washed with distilled water to eliminate the adhering dust particles. They were dried in the shaded place. The dried leaf were powdered, weighed and stored in clean containers (Tamizhazhagan, *et al.*, 2017) [12, 22].

Soxhlet extraction

5g of dried plant powder was extracted for 4-5 hrs. of (150ml) polar, non polar and dipolar solvent (ethanol, methanol, acetone, ether, chloroform etc.) By hot continuous per location method in a Soxhlet apparatus. After the effective extraction, solvent were concentrated using a rotary flash evaporator and water was removed by evaporated to dryness on a hot water bath to yield a soxhlet crude extract.

Photochemical analysis

The phytochemical analysis of the plant was carried out by standard methods provided by Odebiyi and Ramstard, 1978 [10] and Waterman (1993) [11].

Test for tannins

a) 1cm³ of freshly prepared 10% KOH was in addition to 1cm³ of each of the extracts and observed for dirty white

precipitate.

- b) 2 drops of 5% Fe Cl₃ was added to 1cm³ of the extracts and observed for green precipitate.

Test for saponins (frothing test)

- a) 2 cm³ of each extract in a test tube was vigorously shaken for two minutes and observed for persistent foaming.

Test for Flavonoids

To 3cm³ of each extract was added 1cm³ NaOH and observed for yellow colouration.

Salkowski’s for test steroids

5 drops of concentrated H₂SO₄ were added to 1cm³ of each extract and observed for red colouration.

Fehling’s test for glycosides

10 cm³ of 50% H₂SO₄ was in addition to 1 cm³ of the extract in a test tube. The mixture was heated in boiling water-bath for 15 minutes. 10 cm³ of feeling’s solution was added and the mixture was boiled and observed for brick red precipitate

Test for alkaloids

1 cm³ of HCl was in addition to 3 cm³ of each extract in a test

tube. The mixture was kept for 20 minutes, cooled and filtered. 2 drops of Wagner’s reagent was added to 1 cm³ of the filtrate and observed for reddish brown precipitate.

Results

The phytochemical evaluation is best methods of qualitative analysis (Fig.1) of secondary metabolites. The secondary metabolites various solvent system is using primary screening methods like polar, non polar and dipolar was used for preliminary screening. The secondary metabolites structure (Fig: 2) Alkaloid present in the ethyl acetate extracts, flavonoid are present in the metabolic extract and ethyl acetate solvents and also indicate benzene solvent presence in smaller amount. Terpenoids trace amount present in metabolic extract and also phenol compound all solvent present in the plant extracts it may regulate the forging substance. Results show on (Table: 1). the protein presence of methanol and ethyl acetate solvents the phytosteroids present the same. The identifying of secondary metabolites has various examinations much potential of methanolic extracts compared to others. Hence this attempt has clearly monitored various test methanolic extracts high-quality active compound them.

Table 1: Phytochemical screening of plant extract of *Pisonia alba*

S.no	Phyto constituents	Methanol	Ethyl acetate	Acetone	Benzene
1	Alkaloids	--	+	+	--
2	Flavonoids	+++	++	+	+
3	Saponins	+++	--	--	--
4	Steroids	+	+	--	--
5	Tannins	+	--	+	--
6	Terpenoids	+	--	--	--
7	Tri-terpenoids	+	--	++	+
8	Phenol	+++	+	+	+
9	Glycosides	+	--	--	--
10	Protein	++	++	+	+
11	Phytosteroids	+	+	--	+

“+++” Strongly positive phytochemical group, “++”Positive phytochemical group, “+”Trace phytochemical group, “-” Absence of phytochemical group

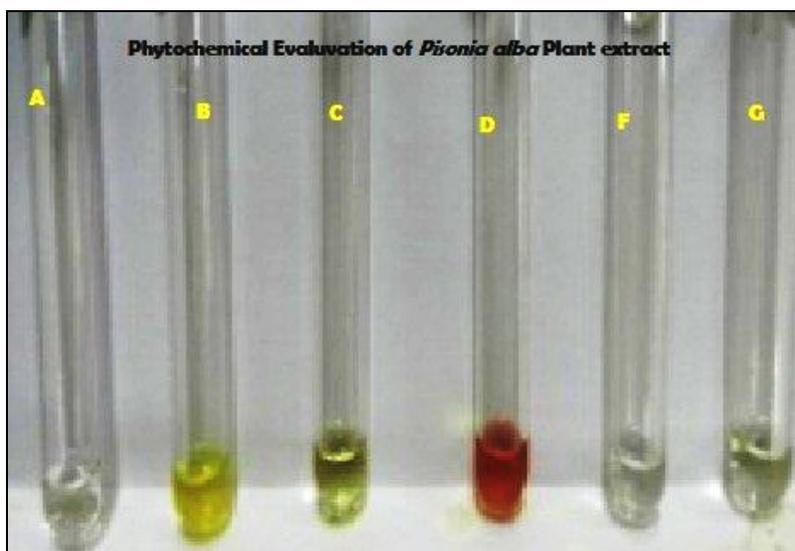


Fig 1: Preliminary screening of *Pisonia alba* plant extract

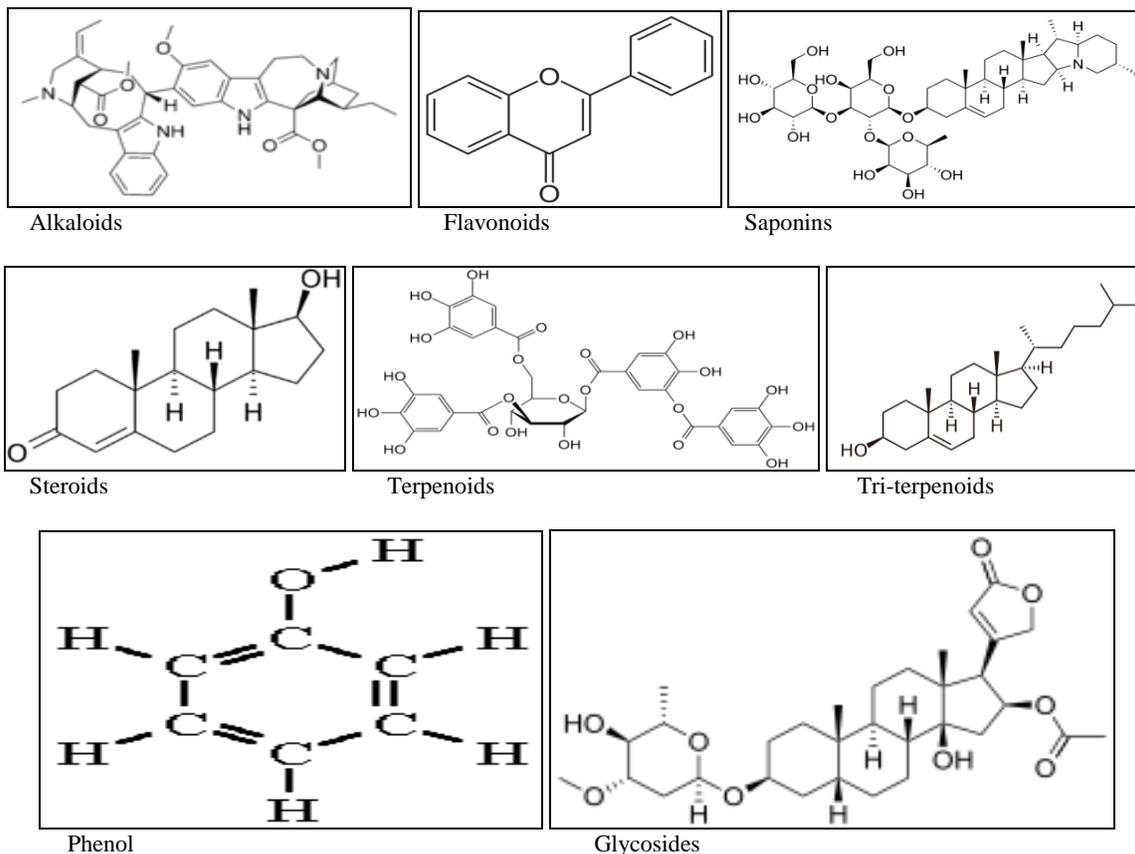


Fig 2: Secondary metabolites compound structure

Discussion

The curative properties of medicinal plants are perhaps due to the presence of various secondary metabolites such as alkaloids, flavonoids, glycosides, phenol, saponins, steroids etc. (Anubha Arora, 2013) [13]. Saponins inborn tendency to ward off microbes makes them good candidates for treating fungal and yeast infections. These compounds served as natural antibiotics, which help the body to fight infections and microbial invasion (Santhi *et al.*, 2011) [14]. Saponins spontaneous tendency to ward off microbes makes them good candidates for treating fungal and yeast infections. These compounds served as natural antibiotics, which help the body to fight infections and microbial invasion (Sodipo *et al.*, 2000) [15]. Basically when spices are used for medicinal purpose, their value is depending on the phytochemicals they possess (Okwu 2001) [16]. The spices, herbs, plant extract and their phytoconstituents have been reported for anti-inflammatory, antidiarrheal, antimicrobial, antioxidant and insecticides activities (Chouhan and Singh, 2011). In the present study, the extract of pepper and nutmeg showed the presence of alkaloids. Alkaloid has important biological property like cytotoxicity and are used in allopathic systems (Trease and Evans, 2005). The glycosides are beneficial in lowering blood pressure. (Tamizhazhagan V, and Pugazhendy K., 2017: Nyarko *et al.*, 1990) [12, 22, 18]. Saponins protect against hypercholesterolemia and antibiotics properties (Amin *et al.*, 2013) [20]. Tannins are extant only in saffron extracts. The growth of many fungi, yeast, bacteria and viruses was inhibited by tannins (Chung *et al.*, 1998). Phenols and tannins

acts as antioxidants (Han *et al.*, 2005) [21]. Traditionally saponins have been extensively used as detergents and pesticides, in addition to their industrial applications as foaming and surface active agents and also beneficial health effects (Shi *et al.*, 2004) [19].

Conclusion

The qualitative analysis of secondary metabolites characterization and isolation of the bio active chemical components possessed by these traditional medicinal plants. The present study leads to the further research in the way of isolation and identification of the activity compound from the selected plants using chromatographic and spectroscopic techniques, and also a method developed researcher and pharmaceutical to help new drug synthesis and develops.

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