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Bio-active compound analysis of *Veitchia winin*

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Abstract

Plants are thought of as associate very important and major resource of healthful properties of living beings. From the past era, there has been high demand to use secondary metabolites and bioactive compounds of plants as healthful agents as a result of artificial medication have indicated a good deal of various aspect effects on the physique. A range of biological activities like inhibitor, malignant tumor and opposing microorganism properties are incontestable by natural phytochemicals derived from plants. The activity of flavonoid and phenolic compounds has been discovered in several latest studies. These are confirmed because the major secondary metabolites with biological activities in plant extracts. Plant phenols are shown to be multifunctional antioxidants which will perform as singlet oxygen quenchers, hydrogen donating antioxidants and reducing agents. In addition a number of important biological effects are confirmed for flavonoids, including antioxidative, antitumor, antiviral, antifungal actions, antibacterial anti-inflammatory and as effective inhibitors of platelet aggregation. They will inhibit a large vary of diseases of the heart, circulatory system, kidneys, muscles, lungs and brain, and that they are terribly useful in retarding the method of aging etc.

Keywords: plants, phytochemicals, medicinal, phenols, flavonoids

Introduction

The importance of plants is understood to us well. The Plantae could be a treasure of potential medication associate degreed within the recent years there has been an increasing awareness regarding the importance of healthful plants. Medications from the plants are simply obtainable, less costly, safe, and economical and barely have facet effects. The plants that are elect for healthful use over thousands of years represent the foremost obvious alternative of examining the present investigate for therapeutically effective new medication like antineoplastic medication Dewick, 1996 [12], antimicrobial medication Phillipson and Wright, 1996 [34], and antihepatotoxic compounds. As per World Health Organization WHO, medicative plants would be the most excellent source to get sort of medication. Regarding eighty percentage of people from developed countries use ancient medicines, that has compounds derived from medicative plants. However, such plants ought to be investigated to higher perceive their properties, safety, and potency Arunkumar and, Muthuselvam, 2009 [5].

Medicinal plants contain some organic compounds which offer definite physiological action on the human body and these bioactive substances embrace tannins, alkaloids, carbohydrates, terpenoids, steroids and flavonoids Edoga *et al.*, 2005 [14]; Mann, 1978 [25]. These compounds are synthesized by primary or rather secondary metabolism of living organisms. Secondary metabolites are with chemicals and taxonomically extraordinarily various compounds with obscure purpose. They're wide utilized in the human medical aid, veterinary, agriculture, scientific research and innumerable alternative areas Vasu *et al.*, 2009 [45]. An outstanding range of phytochemicals belonging to many chemical categories has been shown to possess repressive effects on all sorts of microorganisms *in vitro* Cowan, 1999 [9].

Plant merchandise is a part of phytomedicines since yesteryear. This may be derived from barks, leaves, flowers, roots, fruits, seeds Criagg and David, 2001 [10]. Information of the chemical constituents of plants is fascinating as a result of such data are worth for synthesis of complicated chemical substances Mojab *et al.*, 2003 [27]; Parekh and Chanda, 2007 [31]; Parekh and Chanda, 2008 [32].

In this present work, the analysis of bio-active compounds was carried out in *Veitchia winin*, which was collected in and around Chennai, India.

2. Methodology

2.1 Collection and Preparation of Plant Sample

The various parts of the plant like root, stem, leaves, and fruits were freshly collected from in

and around Chennai, India. The voucher specimen was deposited in Loyola College herbarium and the voucher number is LCH 316. The fresh plant parts are separated and washed with deionized water and then shade dried at room temperature for approximately three weeks. After being shade dried the biomass was milled with a blender and sieved to get fine powder.

2.2 Extraction of bioactive compounds from Plant

The extraction technique was performed according to the method described in Anbu *et al.*, 2016 [1] with slight modification. The crude extracts were re-dissolved in 5 ml of respective solvent and retained for further tests.

2.3 Preliminary phytochemical screening test procedure

Standard screening tests of various extracts hexane, benzene, acetone, chloroform, ethyl acetate, ethanol, methanolic and aqueous were carried out for various plant constituents. The crude extracts were screened for the presence or absence of secondary metabolites such as alkaloids, steroidal compounds, phenolic compounds, flavonoids, saponins, tannins, and

anthraquinones using standard procedures. To get concordant value it was repeated thrice. The phytochemical screenings were performed according to the method described in Yadav *et al.*, 2014 [45].

3. Results

The results of preliminary phytochemical screening of various organic solvents like hexane, benzene, acetone, chloroform, ethyl acetate, ethanol, methanolic and aqueous extract of plant *Veitchia winin* confirms the presence of phytochemical constitutes like tannins, flavonoids, terpenoids, saponins, steroids, phlobatamins, carbohydrates, glycosides, coumarins, alkaloids, phenols. Totally fifteen phytochemical constitutes were tested out of these the phytochemical constitutes such as protein emodins, anthraquinones, Leucoanthocyanins were not present in tested plant extracts was observed. The phytochemical constitutes of hexane, benzene, acetone, chloroform, ethyl acetate, ethanol, methanolic and aqueous extract of plant *Veitchia winin* were detailed descriptions was presented in Table 1.

Table 1: Illustrates the preliminary phytochemical screening of *Veitchia winin*

S. No.	Phytochemicals	Hexane	Benzene	Acetone	Chloroform	Ethyl Acetate	Ethanol	Methanol	Aqueous
01	Tannins	+	+	+	+	+	+	+	+
02	Flavonoids	+	+	-	+	+	+	+	-
03	Terpenoids	+	+	+	+	+	+	+	+
04	Saponins	+	+	+	+	+	+	+	+
05	Steroids	+	+	+	+	+	+	+	+
06	Phlobatamins	+	+	+	+	+	+	+	+
07	Carbohydrates	+	+	+	+	+	+	+	+
08	Glycosides	+	+	-	+	+	+	+	-
09	Coumarins	+	+	-	+	+	+	+	-
10	Alkaloids	+	+	+	+	+	+	+	+
11	Phenols	+	+	+	+	+	+	+	+
12	Protein	-	-	-	-	-	-	-	-
13	Emodins	-	-	-	-	-	-	-	-
14	Anthraquinones	-	-	-	-	-	-	-	-
15	Leucoanthocyanins	-	-	-	-	-	-	-	-

Note: [+] sign indicates the presences of phytochemicals.

[-] sign indicates the presences of phytochemicals.

4. Discussion

The present research investigation was demonstrated the preliminary phytochemical analysis. Based on the polarities the solvents were selected. The various solvents crude extracts were utilized for preliminary phytochemical screening.

Plants are extremely important resource of doubtless helpful bioactive principles for the progress of novel chemotherapeutical agents Tuna *et al.*, 1998 [44]. The biological and pharmacologic properties of several plants are still unknown. World over, the scientists are exploring the potential of utilizing pharmacologically active compounds from medicative plants Karmegam *et al.*, 2012 [20]. Seasoner medicines are utilized by eighty percentages of the natives' worldwide thanks to its high potency, cheap cost, nonnarcotic nature and fewer facet effects Ahmad and Beg 2001 [3]. Within the current study, the exploration of phytochemical screening with methanol and aqueous extract of *Veitchia winin* disclosed the presence of carbohydrate, flavonoid, steroid, phenol, alkaloid, tannin, amino acid, terpenoids and glycoside compounds that are legendary to own remedial activity against diseases generating microorganisms. Thus it is used pharmacologically to develop new compounds for health

profit.

Phytochemical constitutes of plants is psychoanalytic process against by several microorganisms. The therapeutic properties of medicative plants are possibly due to the presence of assorted secondary metabolites Paliwal *et al.*, 2011 [30]. Therefore the preliminary screening check is also helpful within the detection of the bioactive principles and later on could result in the drug discovery and improvement.

Phenolic compounds are a vital cluster of active compounds in herbals since they act disrupting the bacteria plasma membrane, interfering with the adenosine triphosphate pool and sterilization its membrane potential, leading to bacterium's death Tiwari *et al.*, 2015 [43].

Flavonoids are also a very important cluster of active compounds and their action is by the inhibition of deoxyribonucleic acid, ribonucleic acid and proteins synthesis of bacterium and by modifying its membrane permeabilization Dzoyem *et al.*, 2013 [13].

Alkaloids usually exert pharmacologic activity significantly in mammals like as humans. Even these days several of our usually used medicines are alkaloids from natural sources and new organic compound medicine are still being developed for clinical use e.g., taxol from *Taxus baccata*. Most alkaloids

serve as models for the chemical synthesis of analogues with enhanced properties. Imperative examples are hyoscyamine and scopolamine *Atropa belladonna* and *Datura* species as models for artificial parasympatholytic agents; physostigmine *Physostigma venenosum* for synthetic parasympathomimetic agents; tubocurarine *Chondodendron tomentosum* for skeletal muscle relaxants; cocaine *Erythroxylum coca* for local anesthetics; morphine *P. somniferum* for analgesics; and codeine *Papaver somniferum* for antitussive agents, Alkaloids have many other pharmacological activities including antihypertensive effects many indole alkaloids, antiarrhythmic effects quinidine, ajmaline, sparteine, antiprotozoal drug activity quinine, and malignant tumor actions dimeric indoles, periwinkle plant derivative, vinblastine. Antibiotic activities are common for alkaloids and a few are even used as antiseptics in medicine e.g., berberine in ophthalmics and sanguinarine in toothpastes. These are just a few examples illustrating the immense economic importance of this cluster of plant constituents Cordell, 1983 [18].

Coumarins possess a broad variety of pharmaceutical actions and biological functions and has immense importance within the use of medication and conjointly used for treating a range of clinical conditions. They exhibit important pharmacokinetic activity because of its fast absorption and metabolism [9] within the body. Coumarins have a major effect on physiological, bacteriostatic and anti-tumor activity. Skin cancer impact in Warfarin 4-hydroxycoumarin; Renal cell carcinoma effect in Pyranocoumarins; Prostate cancer effect in Pyranocoumarins; Leukemia effect in Coumarin 7-hydroxycoumarin; Breast Cancer effect in Benzopyrones; Cervical Carcinoma effect in Psoralens; Skin disorders like Zymosis fungoides, Psoriasis, Vitiligo effect in Psoralens; Anticoagulant effect in Warfarin these are the list of coumarins and its therapeutic functions Pelkonen *et al.*, 1997 [33].

There are a plenty of epidemiologic knowledge that propose that tannins are helpful within the external treatment of skin inflammation and injuries, which the intake of tannins could avoid the onset of chronic diseases. The biological effects of tannins are extensively studied exploitation varied *in vitro or animal models*, however, *clinical knowledge on humans* remains restricted too many to numerous plant extracts alone. Tannins could exert their biological effects in 2 diverse ways: as unabsorbables, these are usually complex structures with binding properties which can manufacture native effects within the alimentary canal antioxidant, radical scavenging, antimicrobial, antiviral, antimutagenic, and antinutrient effects, or as absorbables, these are typically low relative molecular mass structures that are simply absorbed, and manufacture general effects in different organs Serrano *et al.*, 2009 [40].

Tannins possess varied *in vitro* bioactivities, among that inhibitor and antimicrobial properties were the foremost extensively studied. Tannins are well-known to inhibit lipid peroxidation and to own the facility to scavenge the free radicals that are necessary in cellular prooxidant states. Most of the activities of tannins, as well as their free radical-scavenging capability, mostly rely on their structure and degree of chemical process Okuda, 2005 [29]; Tian *et al.*, 2012 [42]; Jerez *et al.*, 2007 [19].

Terpenoids are commercially fascinating due to their use as flavors and fragrances in foods and cosmetics e.g. menthol, nootkatone and sclareol or as a result of their necessary for the standard of agricultural products, like the flavor of fruits

and also the fragrance of flowers e.g. linalool Aharoni *et al.*, 2004 [2]; Pichersky *et al.*, 1994 [36]. Terpenoids will have medicative properties like anti-carcinogenic e.g. Taxol and Perilla alcohol, antimalarial drug e.g. artemisinin, anti-ulcer, hepaticidal, antimicrobial or diuretic e.g. glycyrrhizin activity Berteau *et al.*, 2005 [7]; Haudenschild and Croteau, 1998 [18]; Lin, Z.J. *et al.*, 2005 [23]; McCaskill and Croteau, 1998 [26]; Rodriguez-Concepcion, 2004 [38]. The terpenoids have also been shown to be of ecological significance Degenhardt *et al.*, 2003 [11]; Pichersky and Gershenzon, 2002 [35]. Compounds like the bitter triterpenoid cucurbitacins and also the pungent diterpenoid polygodial are shown to be concerned in insect resistance Balkema-Boomstra *et al.*, 2003 [6]; Powell *et al.*, 1997 [37].

Saponins have conjointly been asked for within the pharmaceutical business as a result of some kind the place to begin for the semi-synthesis of internal secretion medication. Several have pharmacologic properties and are employed in therapy and in the cosmetic business. They 're believed to create the most constituents of the many plant medication and people medicines, and are thought of chargeable for varied pharmacologic properties Estrada *et al.*, 2000 [15]. Liu and Henkel 2002 [24] think about saponins and polyphenols key ingredients in ancient Chinese medicines, and are answerable for most of the ascertained biological effects. As an example, the ginseng root *Panax ginseng* C.A. Meyer, Araliaceae is one in every of the foremost vital ancient traditional oriental medicines and is currently used worldwide Fukuda *et al.*, 2000 [16].

There are scientific evidences to support the very fact that phytosterols and their derivatives have many biological activities that promote the health of animals, humans and micro-organisms with single few adverse effects, like occur in phytosterolemia, a rare inherited disorder. These health edges embody reduction of plasma total and LD Lcholesterol levels, that decrease the danger of vas diseases; medicinal drug activities; bar of colon, breast and prostate cancers, and treatment of ductless gland dysplasia. Therefore, regular consumption of plant sterols and stanols in natural foods not prodigious three g/day is taken into account healthy to man and animals Ogbe *et al.*, 2015 [28].

The alertness of the importance of carbohydrates in living systems and in drugs is growing because of the increasing understanding of their biological and pharmacologic connection and their involvement in an exceedingly giant array of physiological processes as well as diseases Hacker *et al.*, 2005 [17]; Rudd *et al.*, 2001 [39]; Alper, 2003 [4]; Shriver *et al.*, 2004 [41]. Carbohydrates are omnipresent, coat all cells glycocalyx, are found within the extracellular matrix and have several biological roles as well as energy storage and transport, signaling, cell-cell communication, pathological process, resistant reaction and modulation of protein and lipid purpose Laine, 1997 [22].

5. Conclusion

A large variety of medicative plants are used as alternate medication for diseases of man and alternative animals since most of them are while not facet effects compared with artificial drugs. Identification of the chemical nature of phytochemical compounds present in the medication plants can give some info on the various purposeful teams answerable for their medicative properties.

The current work was performed to make a range of phytochemical factors that might give as vital and has

marketable attention in each analysis institutes and pharmaceuticals corporations for the producing of the innovative drugs. This primary info can facilitate in conducting additional studies on discovery of bioactive constituents, resolve of their efficaciousness by *in vivo* studies and demonstration of their safety and efficaciousness in clinical trials.

The results discovered the presence of medicinally necessary constituents within the plants studied. Several evidences gathered in earlier studies that confirmed the known phytochemicals to be bioactive. Many studies confirmed the presence of those phytochemicals contribute medicative yet as physiological properties to the plants studied within the treatment of various ailments. Therefore, extracts from these plants can be seen as an excellent resource for helpful medication. The conventional medication apply is suggested powerfully for these plants yet because it is recommended that additional work ought to be dole out to isolate, purify, and characterize the active constituents answerable for the activity of those plants. Additionally further work is inspired to elucidate the potential mechanism of action of those extracts.

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7. References

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