



The Medicinal Properties And Phytochemical components present in Five medicinal plants -Aloe vera, Azadirachta indica (Neem), Withania somnifera L.(Ashwagandha), Ocimum sanctum (Tulsi), Adhatoda Vasica(Adulsa)

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Abstract :

Phytochemicals are chemicals of plant origin. Phytochemicals (from Greek phyto, meaning "plant") are chemicals produced by plants through primary or secondary metabolism. They generally have biological activity in the plant host and play a role in plant growth or defense against competitors, pathogens, or predators. Phytochemicals are produced by plants as a defence mechanism against pathogens. They are used to treat various metabolic, immunological and neurological disorders in humans in various parts of the world as a part of traditional medicine. The use of indigenous plants in commercial medicine is rising with increasing population. The antimicrobial properties of plant extracts led to increased demands. Plant tissue culture on the other hand, has proved to be a reliable alternative for the production of bioactive compounds from plants. Artificial plant culture can enhance the production of phytochemicals in medicinal plants. This review focuses on the medicinal properties of phytochemicals and their in-vitro production. The main phytochemical components, present in medicinal plants are tannins, alkaloids, saponins, cardiac glycosides, steroids, terpenoids, flavonoids, phlobatannins, anthraquinones, and reducing sugars.

1. Aloe Vera-Aloe vera is well known its for its medicinal properties against hepatic steatosis and it has also been demonstrated that extract improves this condition in rats. Kaempferol is a bioactive compound in A. vera which exhibits hepatoprotective activity . Lophenol and cycloartenol are some other A. vera phytosterols which when administered to Zucker diabetic fatty rats shows significant decrease of lipogenic gene expression and reduced hepatic lipid accumulation.

2. (Azadirachta indica) Neem - Neem is a useful traditional medicinal plant growing in Nigeria, India, and America. The phytochemicals and the biopesticidal components present were ascertained. The results showed that saponins, steroids and terpenes were mostly present, while tannins and glycosides were moderately present, and

alkaloids, flavonoids, phenols and oxalic acid were least present. The presence of these phytochemical could account for the therapeutic uses of neem. Neem shows therapeutics role in health management due to rich source of various types of ingredients. The most important active constituent is azadirachtin and the others are nimbolinin, nimbin, nimbidin, nimbidol, sodium nimbinate, gedunin, salannin, and quercetin.

3. Withania somnifera L (Ashwagandha).- It is a multipurpose medicinal plant of family Solanaceae occurring abundantly in sub-tropical regions of the world. The folk healers used the plant to treat several diseases such as fever, cancer, asthma, diabetes, ulcer, hepatitis, eyesores, arthritis, heart problems, and hemorrhoids. The plant is famous for the anti-cancerous activity, low back pain treatment, and muscle

strengthening, which may be attributed to the withanolide alkaloids. *W. somnifera* is also rich in numerous valued secondary metabolites such as steroids, alkaloids, flavonoids, phenolics, saponins, and glycosides. A wide range of preclinical trials such as cardioprotective, anticancer, antioxidant, antibacterial, antifungal, anti-inflammatory, hepatoprotective, antidepressant, and hypoglycemic have been attributed to various parts of the plant. Different parts of the plant have also been evaluated for the clinical trials such as male infertility, obsessive-compulsive disorder, antianxiety, bone and muscle strengthening potential, hypolipidemic, and antidiabetic. This review focuses on folk medicinal uses, phytochemistry, pharmacological, and nutraceutical potential of the versatile plant.

In the Ayurvedic system of medicines, roots and leaves of the plant were considered phytotherapeutic agents to cure various ailments. Various clinical and preclinical trials exhibited the plant's potential in curing hepatotoxicity, neurological disorders, anxiety, Parkinson's disease and hyperlipidemia. The fruits contained considerable amounts of saponins and leaves possessed insect repellent properties.

Phytochemical analysis of *W. somnifera* revealed the presence of pharmacologically active steroidal lactones named withanolides. Withanine, a group of alkaloids isolated from the roots of the plant, forms 38% of the total weight of alkaloids. The principal withanolides extracted from *W. somnifera* in India were withanolide D and withaferin A which exhibited antitumor and cytotoxic properties. In addition to alkaloids, the plant also consisted of steroids, saponins, phenolics, flavonoids, phytophenols, and glycosides. Also, it is widely used in traditional medicine formulations as an antipyretic, analgesic, adaptogenic, and anti-inflammatory agent.

4. *Ocimum sanctum* (Tulsi)- It is an aromatic plant. Plants have served human kind as sources of medicinal agents since its

earliest beginnings. In fact natural product once served as the source of all drugs. The main chemical constituents of Tulsi are: Oleanolic acid, Ursolic acid, Rosmarinic acid, Eugenol, Carvacrol, Linalool, and β -caryophyllene, have been used extensively for many years in food products, perfumery, and dental and oral products and plant extract continues the numerous searches for more effective drugs of plant origin which are less toxic and available for low socio-economic population in the treatment of diseases caused by pathogenic bacteria. Recent studies suggest that Tulsi may be a COX-2 inhibitor, like many modern painkillers, due to its high concentration of eugenol. The present study was to evaluate the phytochemical screening of aqueous extracts of leaves of *Ocimum*. Study has been shown that this medicinal herbs can be used as pharmaceutical adjuvants in the formulation of various dosage form.

5. *Adhatoda Vasica*(Adulsa)-

The Adulsa Leaves is native to India, although it can also be found in Nepal, Sri Lanka, Pakistan, Malaysia, Indonesia, and China. This Vasaka plant is recognizable by its yellow bark, crossbow leaves, white and purple flowers, and pubescent club-shaped capsular fruits.

Adhatoda vasica mainly consists of alkaloids containing pyroquinazoline ring derivatives like vasicine, vasicol, vasicinone along with other mineral constituents. The decoction of Adulsa leaves is used to manage cough and cold due to its expectorant property. A paste of Adulsa leaves is applied on the wounds to promote healing due to its quick healing and anti-inflammatory properties. It also helps to manage skin infections due to its antibacterial property[

Conclusion- Phytochemicals are produced by plants as a defence mechanism against pathogens. The main phytochemical components, present in this Five medicinal plants are tannins, alkaloids, saponins, cardiac glycosides, steroids, terpenoids,

flavonoids, phlobatannins, anthraquinones, and reducing sugars.

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