

PRELIMINARY PHYTOCHEMICALS INVESTIGATIONS ON INDIAN GINSENG *WITHANIA SOMNIFERA* DUNAL.

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Abstract: The interest in medicinal and aromatic plants has been shown all over the world because of safe and effective constituents of plant products and in particularly the presence of active principles of medicinal plants. Medicinal plants at present are largely being used in pharmaceuticals, cosmetic, agricultural and food industry. The developing countries mostly rely on traditional medicines. This traditional medicine involves the use of different plant extracts or the bioactive constituents. This study such as ethnomedicine keenly represents one of the best avenues in searching new economic plants for medicine. In keeping this view in mind the present investigation is carried out on the plant material of *Withania somnifera* Dunal. The result suggest that the phytochemical properties of plant material for curing various ailments.

Keywords: *Withania Somnifera*, Preliminary Phytochemical, Traditional medicine, Withanolides.

INTRODUCTION

The importance of plant is well known to us. Plants produce not only food for surviving but also create healthy environment and eco-friendly atmosphere to live. There are many “families” of phytochemicals and they help the human body in a variety of ways. Phytochemicals are non-nutritive plant chemicals that have protective or disease preventive properties.

Withania somnifera Dunal, commonly known as Ashwagandha, has been used for the centuries in Ayurvedic medicine to increase longevity and vitality. It is an erect, branched, evergreen, tomentose shrub, belongs to family solanaceae or nightshade family. It is sometimes called “Indian Ginseng” in reference to its regenerative and tonic effect on nervous system. The flowers are small and green, while the ripe fruit is orange-red and has milk-coagulating properties. The plant has long brown tuberous roots.

In Ayurveda, the roots of *W. somnifera* are used to prepare medicinal Ashwagandha. It is claimed to possess aphrodisiac, sedative, rejuvenative and life prolonging properties. In combination with other drugs it is prescribed for snake-bite and scorpion-sting. The tuber is used as aphrodisiac, tonic, anthelmintic, useful in ‘Vata’ and ‘Kapha’, bronchitis, asthma, ulcers, scabies, marasmus of children, insomnia, senile debility (Kirtikar and Basu, 1935). The berries and leaves are traditionally used a tropical treatment for tumors and tubercular glands,

carbuncles and ulcers, inflammations and swellings (Grieve, 1974). The seeds are diuretic, hypnotic and employed to coagulate milk and also used as a masticatory.

The main constituents of ashwagandha are alkaloids and steroidal lactones. Withanine is the main constituent among the various alkaloids. The other alkaloids are somniferine, somnine, somniferinine, withananine, pseudo-withanine, tropine, pseudo-tropine and anferine (Watt, Breyer, 1962). The tender shoots are rich in crude protein, calcium, phosphorus and was not fibrous. It is reported to contain scopoletin (wealth of India 1950). The leaves contain steroidal lactones, which are commonly called withanolides.

Leaves and roots are narcotic (Kapoor, 2000). Ashwagandha is reported to have anti-carcinogenic effects in animals and cell cultures by decreasing the expression of nuclear factor – kappa B, suppressing intercellular tumor necrosis factor and potentiating apoptotic signalling in cancerous cell lines. It acts as a mitotic poison arresting the division of cultured human-larynx carcinoma cells at metaphase (Wealth of India, 1950).

MATERIALS AND METHODS

Collection of Plant Materials: Material of Ashwagandha plant (Free from disease) was collected from the botanical garden of Meerut college, Meerut, U.P. The plant material was washed thoroughly 2-3 times with running tap water, plant material was then air dried under shade. After

complete shade drying the plant material was grinded in mixer, the powder was kept in small plastic bags.

Preliminary Phytochemicals Analysis: This was carried out according to the methods described by Trease and Evans. Qualifications phytochemicals analysis of the crude powder of the plant for the identification of phytochemicals like as a tannins, alkaloid, steroid, phenols & Terpenoid, Flavonoid etc.

Tannins: Plant powder + $\text{FeCl}_3 \rightarrow$ Blue-Black precipitate indicate the presence of tannins and phenols.

Alkaloids: Plant powder + Dragendroff's reagent/ Mayer's reagent/Wagner's reagent/Tannic acid/Hager's reagent produced Orange ppt./Brown colour/Brown colour/Turbidity/Yellow colour \rightarrow indicate the presence of alkaloids.

Lignin: Plant powder + Phloroglucinol + HCl \rightarrow Dark red colour confirmed the presence of lignin.

Carbohydrate: Molisch test: Plant powder + H_2SO_4 + α -naphthol + phenol \rightarrow red colour indicates the presence of carbohydrate.

Protein: Millon's Test: 5 gm dried plant powder + 2-3 drops of HgNO_3 and HNO_3 + boiled \rightarrow Red colour indicate the presence of protein.

Sugars: 2 ml. filtrate + 5ml. Benedict's reagent + Heat \rightarrow Yellow red colour indicate the presence of sugars.

Subernin: 2 gm. Dried plant powder + $\text{KOH} + \text{H}_2\text{SO}_4$ + Heat \rightarrow Brick red coloured solution confirmed the presence of subernin.

Glycoside: The plant extract was hydrolysed with HCL for few hours on a water bath. To the hydrolysate, 1 ml. of pyridine was added and a few drops of sodium nitroprusside solutions were added and then it was made alkaline with sodium hydroxide solution \rightarrow appearance of pink to red colour shows the presence of glycosides.

Saponin: 5 gm Plant powder + 10ml. water heated \rightarrow Formation of Froth \rightarrow indicate the presence of saponin.

Flavin: Shinoda's test: 5gm. Plant powder + 50ml. 95% ethyl alcohol \rightarrow extraction \rightarrow 10ml. extract + 1 ml. conc. HCl \rightarrow red colour indicates the presence of flavin.

Steroids: Liebermann Buchard Reaction : Alcoholic extract + Liebermann Buchard reagent \rightarrow violet colour indicates the presence of steroid.

Preliminary phytochemical Screening of *Withania somnifera* Dunal.

Sl. No.	Tests	Reagents	Nature of Colour
1.	Tannin	FeCl_3	Blue-Black ppt.
2.	Alkaloids	Dragendroff's Reagent	Orange ppt.
3.	Alkaloids	Mayer's Reagent	Brown Colour
4.	Alkaloids	Wagner's Reagent	Brown Colour
5.	Alkaloids	Tannic acid	Turbidity
6.	Alkaloids	Hager's Reagent	Yellow Colour
7.	Lignin	Phloroglucinol+HCL	Dark red colour
8.	Carbohydrates	Molisch Test	Red Colour
9.	Protein	Millon's Test	Red Colour
10.	Sugar	Benedict's Reagent	Yellow-Red Colour
11.	Subernin	Sample + $\text{KOH} + \text{H}_2\text{SO}_4$ + Heat	Brick-Red Colour
12.	Glycoside	Molisch Test after Hydrolysis	Red Colour
13.	Saponin	Plant Powder + H_2O + Shake	Formation of froth
14.	Flavin	Shinoda's Test	Red Colour
15.	Steroid	Liebermann's Buchard Reagent	Violet Colour

RESULTS AND DISCUSSION

The result obtained in the present investigation showed the presence of alkaloids, lignin, carbohydrates, protein, sugars, suberin, Glycosides, Saponins, Flavin, steroids and Tannis.

A variety of herbs and herbal extracts contain various phytochemicals with biological activity and which can be of valuable therapeutic index. Much of the protective effects of different parts of the plant (e.g. leaves, roots, stem and fruits etc.) has been attributed by phytochemicals. The most phytochemicals classified as secondary metabolites and are the non-nutrient plant compounds. Different phytochemicals have been found to possess a wide range of activities, which may help in protection against chronic disease. Plants produce these chemicals to protect themselves and recent research demonstrates that many phytochemicals can protect humans against diseases.

Ashwagandha is considered to be one of the best regenerating agents in Ayurveda. Its roots, leaves and seeds are used in Ayurvedic and Unani medicines. Anti-Cancer activities are present in the leaf extract of Ashwagandha and withanolides act as cancer inhibitory factors and thus, is a natural source for safe anti-cancer medicine. Withanolides are a group of pharmacologically active compounds present in the roots and leaves of *Withania somnifera*. Pharmacological studies and research so far have indicated that Ashwagandha has anti-tumour, anti-stress, antioxidant, mind-boosting, haemopoietic and rejuvenating properties.

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