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 solanacease or nightshade family. It is sometimes called “Indian Ginseng” in reference to its reguvenative 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 aphrodisia, tonic, anthelmintic, useful in ‘Vata’ and ‘Kapha’, bronchitis, asthma, ulcers, scabies, marasmus of children, insomina, 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 + FeCl₃ → Blue-Black precipitate indicate the presence of tannins and phenots.

**Alkaloids:** Plant powder + Dragendorff’s reagent/Mayer’s reagent/Wagner’s reagent/Tannic acid/Hager’s reagent produced Orange ppt./Brown colour/Brown colour/Trubidity/Yellow colour → indicate the presence of alkaloids.

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

**Carbohydrate:** Molisch test: Plant powder + H₂SO₄ + α-napthol + phenol → red colour indicates the presence of carbohydrate.

**Protein:** Millon’s Test: 5 gm dried plant powder + 2-3 drops of HgNO₃ and HNO₃ boiled → Red colour indicate the presence of protein.

**Preliminary phytochemical Screening of Withania somnifera Dunal.**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Tests</th>
<th>Reagents</th>
<th>Nature of Colour</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tannin</td>
<td>FeCl₃</td>
<td>Blue-Black ppt.</td>
</tr>
<tr>
<td>3.</td>
<td>Alkaloids</td>
<td>Mayer’s Reagent</td>
<td>Brown Colour</td>
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<tr>
<td>4.</td>
<td>Alkaloids</td>
<td>Wagner’s Reagent</td>
<td>Brown Colour</td>
</tr>
<tr>
<td>5.</td>
<td>Alkaloids</td>
<td>Tannic acid</td>
<td>Turbidity</td>
</tr>
<tr>
<td>6.</td>
<td>Alkaloids</td>
<td>Hager’s Reagent</td>
<td>Yellow Colour</td>
</tr>
<tr>
<td>7.</td>
<td>Lignin</td>
<td>Phloroglucinol+HCl</td>
<td>Dark red colour</td>
</tr>
<tr>
<td>8.</td>
<td>Carbohydrates</td>
<td>Molisch Test</td>
<td>Red Colour</td>
</tr>
<tr>
<td>9.</td>
<td>Protein</td>
<td>Millon’s Test</td>
<td>Red Colour</td>
</tr>
<tr>
<td>10.</td>
<td>Sugar</td>
<td>Benedict’s Reagent</td>
<td>Yellow-Red Colour</td>
</tr>
<tr>
<td>11.</td>
<td>Suberin</td>
<td>Sample + KOH+ H₂SO₄+ Heat</td>
<td>Brick-Red Colour</td>
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<tr>
<td>12.</td>
<td>Glycoside</td>
<td>Molisch Test after Hydrolisis</td>
<td>Red Colour</td>
</tr>
<tr>
<td>13.</td>
<td>Saponin</td>
<td>Plant Powder + H₂O+ Shake</td>
<td>Formation of froth</td>
</tr>
<tr>
<td>14.</td>
<td>Flavin</td>
<td>Shinodas Test</td>
<td>Red Colour</td>
</tr>
<tr>
<td>15.</td>
<td>Steroid</td>
<td>Libermann’s Buchard Reagent</td>
<td>Violet Colour</td>
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</tbody>
</table>
RESULTS AND DISCUSSION

The result obtained in the present investigation showed the presence of alkaloids, lignin, carbohydrates, protein, sugars, subernin, 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 phytochemical 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. Plant produces these chemicals to protect itself and recent research demonstrates that many phytochemicals can protect humans against diseases.

Ashwagandha is considered to be one of the best rejuvenating agents in Ayurveda. It’s roots, leaves and seeds are used in Ayurvedic and Unani medicines. Anti Cancer activities are present in the leaf extract of Ashwagandha and withanone acts as a cancer inhibitory factor and thus, is a natural source for safe anti-cancer medicine. Withanolides are 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.

REFERENCES


