ISSN: 2320 - 4230

Journal of Drug Discovery and Therapeutics

Available Online at www.jddt.in

CODEN: - JDDTBP (Source: - American Chemical Society)

Volume 3, Issue 28, May, 2015, 28-30

Review Article

The Phytochemical Constituents of *Withania Somnifera* (Ashwagandha)

Sheetal Singh, Hansa Choudhary, Komal Wadhawan

B Pharmacy, Faculty of Pharmaceutical Sciences

Jayoti Vidyapeeth Women's University Jaipur, Rajasthan (India)

Received 04 May 2015; Accepted 16 May 2015

ABSTRACT

Withania somnifera is a well known Indian medicinal plant widely used in the treatment of many clinical conditions in India. Unani system of medicine, roots of
Withania somnifera commonly known as Asgand are used for the medicinal properties. Two varieties of Asgand have been mentioned in classical Unani literatue: 1) *Asgand Nagori* and 2) *Asgand Dakani*.
Asgand Nagori is preferred for its more potential medicinal properties.
The roots of *Withania somnifera* consist primarily of compounds known as withanolides, which are believed to account for its extraordinary medicinal properties.

Keywords: Ginger, *Withania somnifera* Asgand

INTRODUCTION

Withania somnifera belongs to the family solanaceae. It is a xerophytic plant, found in the drier parts of India, Sri Lanka, Afghanistan, Baluchistan and Sind and is distributed in the Mediterranean regions .It is found in high altitude ascending to 5,500 feet in the Himalayas. This shrub is common in Bombay and Western India. It is also cultivated for medicinal purposes in fields. It is widely cultivated in Bikaner and Pilani areas of Rajasthan, Rajputana, Punjab and Manasa.

The fresh roots are collected during January to March and dried under shade for several days. The drug retains its therapeutic efficacy for less than 2 years. It decomposition and loses its potentials within 2 years. So the fresh dried roots are preferred for medicinal uses.
Chemical analysis of Ashwagandha shows constituents to be alkaloids and steroidal lactones. Among the various alkaloids, withanineis the main constituent.

Two acyl steryl glucoside viz. sitoindoside VII and sitoindoside VIII have been isolated from root. The leaves contain steroidal lactones, which are commonly called withanolides. Twelve alkaloids, 35 withanolides, and several sitoindosides from *Withania somnifera* have been isolated and studied. Much of Ashwaganda's
Pharmacological activity has been attributed to two main withanolides, withaferin A and withanolide D.

PHYTOCHEMICAL STUDIES

Root

The roots are contain alkaloids, amino acids, steroids, volatile oil, starch, reducing sugars, glycosides, hentriacontane, dulcitol, withaniol, an acid and a neutral compound .

Leaf

The leaves of the plant are contain 12 withanolides, 5 unidentified alkaloids (yield, 0.09%), many free amino acids, chlorogenic acid, glycosides, glucose, condensed tannins, and flavonoids.

Fruit

The green berries contain amino acids, a proteolytic enzyme, condensed tannins, and flavonoids. They contain a high proportion of free amino acids which include proline, valine, tyrosine, alanine, glycine, hydroxyproline, aspartic acid, glutamic acid, cystine and cysteine. The presence of a proteolytic enzyme, *chamase*, in the berries may be responsible for the high content of the amino acid.

Shoots: The tender shoots are rich in crude protein, calcium and phosphorous, and are not fibrous. They are reported to contain *scopoletin*.

Stem: The stem of the plant contains condensed tannins and flavonoids.

Bark: The bark contains a number of free amino acids.

**Corresponding author: Sheetal Singh |E-mail: singhsheetal781@gmail.com*

Figure 1:

MEDICINAL USES OF WITHANIA SOMNIFERA

Anti-stress

Center indicated that extracts of Ashwagandha produce GABA-like activity, which may account for the herb's anti-anxiety effects. GABA (Gamma Amino-butyric acid) is an inhibitory neurotransmitter in the brain. Its function is to decrease neuron activity and inhibit nerve cells from over firing. This action produces a calming effect. Excessive neuronal activity can lead to restlessness and insomnia, but GABA inhibits the number of nerve cells that fire in the brain, and helps to induce sleep, uplift mood, and reduce anxiety.

Antibiotic Activity: It was active against *Micrococcus pyogenes var aureus* and partially inhibited the activity of *Bacillus subtilis* glucose-6-phosphatedehydrogenase. Withaferin A inhibited Ranikhet virus. The shrub's extract is active against Vaccine virus and *Entamoeba histolytica*. Asgand showed the protective action against systemic Aspergillus infection. Antibiotic activity of Withaferin A is due to the presence of the unsaturated lactone-ring. It substantiates the reputation of the leaves as a cure for ulcers and carbuncles in the indigenous system of medicine

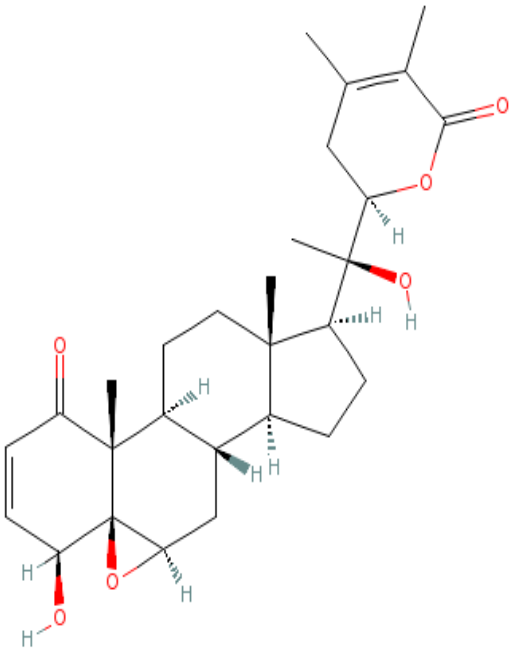

Figure 2: Withanolide A Musculotropic Activity

The total alkaloids of Asgand showed relaxant and antispasmodic effects against several spasmogens on intestinal, uterine, bronchial, tracheal and blood vascular muscles.

Anti-oxidant Activity

Antioxidant effect of active glycowithanolides of *Withania somnifera* (WSG) may explain, at least in part, the reported anti-inflammatory, immunomodulatory, and anti-stress, anti aging and cognition-facilitating effects produced by them in experimental animals, and in clinical situations.

Hepatoprotective Activity

Withaferin A at 10mg/kg dose showed significantly protective effect against CCl4-induced hepatotoxicity in rats. It was as effective as hydrocortisone dose for dose.

Anti-ageing Effect

It statistically significant increase in Hb, RBC, hair melanin, and seated stature in treated group incomparison to placebo group. Decrease in serum cholesterol was more in treated group than in placebo group

References

1. Rastogi RP, Mehrotra BN. *Compendium of Indian Medicinal Plants*, Vol.6. Central Drug Research Institute, New Delhi, 1998.

2. Uddin, G., A. Rauf, T.U. Rehman and M. Qaisar, 2011.Phytochemical Screening of Pistacia chinensis var.integerrima, 2011. Middle-East J. Sci. Res., 7(5): 707-711.

3. Kulkarni S.K., George B. Anticonvulsant action of Withania *somnifera* root extract against pentylene tetrazole (PTZ)-induced convulsions in mice. Phytotherapy Res. 1996; 95 (10): 447-449.

4. Archana R., Namasivayam A. Anti-stressor effect of *Withania somnifera*. J Ethnopharmacol. 1999; 64 (1): 91-93.

5. Behl PN, Arora RB, Srivastava and Malhotra SC. Herbs Useful in Dermatological Therapy. CBS Publishers and Distributors (1993) 141-142.