Withania somnifera, also known as Ashwagandha is an important medicinal plant mentioned in indigenous systems of medicine (Ayurveda, siddha and unani). Ashwagandha belongs to genus Withania include approximately 26 species of which only two species W. somnifera and W. coagulans are known to occur in India. According to ayurveda varied medicinal properties are attributed to different parts of plants.

It is one of the most ancient plant. Withanin and withanoloida being an alkaloid and have strong effect against alexipharmic, tuberculosis, insomnia, arthritis, cough, dropsy senile debility. Various part of the plant are useful as antibacterial, antifungal, anti-inflammatory, antipurgative alexipharmic, somniferous, tonic and treat to neurological disorder, respiratory system, cardiovascular system, gastric activity, leucoderma, ricketsia, hypnotic activity, rheumatism, senility, impotency, loose teeth, bone weakness, muscle weakness, tension, thirst, emaciation, debility have also been studied. These studies are very encouraging and indicate this herb should be studied more extensively to confirm these results and reveal other potential. Clinical trials using ashwagandha for a variety of conditions should also be conducted.

Keywords: Withania somnifera, Withanin, Pharmacological activities, Phytochemistry
and considered them narcotic and hypnotic respectively. Roots are also used for toning up uterus of women who habitually miscarry. Leaves used to cure eye sores, heated form of leaves applied to painful joints, root bark administered to patients of asthma and chest problems, the green berries used for ringworm in both human beings and animals, it can also used as a substitute for rennet, to coagulate milk in cheese making (Mirjalili et al., 2009). Leaf and root powder consider as deobstruent.

**Classification**

Order – **Solanales**  
Family – **Solanaceae**  
Genus – **Withania**  
Species – **W. somnifera**

Species of Aswagandha (Based on Index Kewensis)

- Withania arborescens  
- Withania riebeckii  
- Withania mollis  
- Withania melanocystis  
- Withania novo-friburgensis  
- Withania holstii  
- Withaniaoocarpa  
- Withania adunensis  
- Withania pulvinata  
- Withania sicula  
- Withania pyrifolia  
- Withaniaagrosii  
- Withaniaorinocensis  
- Withania obtusifolia  
- Withania ramose  
- Withania microphysalis  
- Withaniaasubtriflora  
- Withania kansuensis  
- Withania aristata  
- Withania qaralitica  
- Withania frutescens  
- Withania sphaerocarp  
- Withania somni  
- Withania adpressa  
- Withania coagulans  

**Part Used-Roots, Leaves, Fruits, Seeds, Whole Plant**

**Synonyms**

Sanskrit-Ashwagandha, Ashvakandika, Ashvaroha, Haya, TuragiEnglish-WinterCherry; Hindi-Asgandh, Asgund, Punir; Kenya: kibarariet, olAsajet; Persian; Kaknajehindi; Malyalum Amukkiram, Pevetti; Gujarati-Asan, Asun, Asoda, Asundha, Ahan; Punjabi-Ak, Aksan, Asgandh, Asgandnargori, Isgandh; Marathi-Askandha, askand, Tili, Tula, Asgund, Asvagandha; Tamil-Amukkira, Asubam, Asuvagandi.

**PHYTOCHEMISTRY**

Alkaloids and withanolides are the major groups of the secondary metabolites of medicinal interest isolated and characterized from
**Withania somnifer**a. Besides these plant carries flavonol, glycowithanolides, sterols and phenolics.

**Alkaloids**
The root is reported to contain tropine, *Pseudotropine* (Khanna et al., 1961) *Nicotine*, *omniferine*, *Somniferinine*, *Somnia*, *Withanine*, *Pseudo-withanine*, *withananine* (Majumdar, 1955) *dl-isopelletierine*, *cuscohygrine* (Leary et al., 1961; and Schwarting et al., 1963) *Anaferine* (El-Olemy and Schwarting, 1966). The total alkaloidal content of Indian roots has been reported to vary between 0.13 and 0.31%.

**Withanolides**
*W. somnifera* shows a great variability in chemical constituents, particularly in the leaves. The leaves of the plant from different habitats are characterized by the presence of variously substituted steroidal lactones of the withanolide group. The term withanolide has been given to a group of compounds characterized by a C-28 basic steroidal skeleton with a nine carbon atoms side chain in which C-22 and C-26 are appropriately oxidized to form a six membered lactone ring. The first scientific investigation on chemical constituents of *W. Somnifera*, collected in South Africa, revealed the presence of withaniol (C$_{25}$H$_{34}$O$_5$) isolated from roots and two other compounds, somnirol (C$_{32}$H$_{44}$O$_7$) and somnitol (C$_{33}$H$_{46}$O$_7$) isolated from the leaves (Power and Salway, 1911) unsaturated lactone (C$_{24}$H$_{30}$O$_6$) obtain from the leaves of Indian origin, the compound was found to possess remarkable antibacterial properties (Kurup, 1956a and 1958) isolated somnitol (Power, 1911) and a new compound designated as withanone (C$_{24}$H$_{32}$O$_5$) from the leaves of *W. Somnifera* collected in India (Dhall et al., 1961b).

**Pharmacological Effects**

**Anti-Carcinogenic**
It is reported to have anti-carcinogenic effects in animal and cell cultures by decreasing the expression of nuclear factor Kappa B, suppressing intercellular tumor necrosis factor and potentiating apoptotic signaling in cancerous cell lines (Ichikawa et al., 2006).

**Antibacterial**
Its antibacterial activity is due to withaferin A which have unsaturated lactone ring. Opening of the lactone ring by alkaline hydrolysis or saturating the double bond causes the loss of activity. Cystein and glutathione inactivate the antibiotic. (Kurup, 1962). The unsaturated lactone in the side chain is also important for the antitumor activity.

**Antioxidant:** An aqueous suspension of root extract of Ashwagandha prevented the rise of experimentally induced lipid peroxidation in rabbits and mice (Dhuley, 1998a). An extract of *Withania somnifera*, consisting of equimolar concentrations of sitoindosides VII-X and withaferin A, induced an increase in the levels of superoxide dismutase, catalase and glutathione peroxidase in rat brain, consistent with other research that reports an antioxidant, immunomodulant and antiinflammatory activity (Bhattachary et al., 1997).

**Central Nervous System:** Isolated constituents of *Withania somnifera* (sitoindosides VII-X and withaferin-A) increased cortical muscarinic acetylcholine receptor capacity, partly explaining the cognition-enhancing and memory-improving effects traditionally attributed to Ashvagandha (Schliebs et al., 1997). A methanolic extract of *Withania somnifera* inhibited the specific binding of [3H]GABA and [35S]TBPS, and enhanced the binding of [3H]flunitrazepam to their putative
receptor sites, suggesting a GABA-mimetic activity. A commercial root extract of *Withania somnifera* used repeatedly over nine days attenuated the development of tolerance to the analgesic effect of morphine and suppressed morphine-withdrawal jumps (Kulkarni and Ninan, 1997).

**Musculo-Skeletal:** A herbomineral formulation containing roots of *Withania somnifera*, the stem of *Boswellia serrata*, rhizomes of *Curcuma longa* and a zinc complex (Articulin-F), was evaluated in a randomized, double-blind, placebo controlled, cross-over study in clients with osteoarthritis. The results produced a significant drop in severity of pain and disability, although radiological assessment did not show any significant changes. Side effects were minimal and did not necessitate the withdrawal of treatment (Kulkarni *et al.*, 1991).

**Toxicity:** Ashvagandha appears to be very safe, with an LD50 of a 50% alcohol extract determined to be 1000 mg/kg in rats (Aphale *et al.*, 1998; and Williamson, 2002).

**Side Effects**
It was cleared in the clinical trials of *Withania somnifera*, the side effects experienced by *W. somnifera* treated individuals were not significantly different than the side effects experienced by placebo treated individuals (Chopra *et al.*, 2004; and Cooley *et al.*, 2009) However, there has been one report that *W. somnifera* can stimulate the thyroid and lead to thyrotoxicosis in some people.

**CONCLUSION**
The extensive survey of literature revealed that the *Withania somnifera* is an important species for pharmacologically and medicinally such as aphrodisiac, sedative, rejuvenative, life prolonging, dehydration, bone weakness, thirst, debility, constipation, rheumatism, memory loss, senility, premature agein, bone cancer, Parkinson disease, tuberculosis, etc. It is also beneficial in reducing anxiety and reducing arthritis pain in the knee. It has been used successfully in Ayurvedic medicine for centuries, more clinical trials should be conducted to support its therapeutic use.

**SUMMARY**
*Withania somnifera*, also known as ashwagandha, it has been important herb in the Ayurvedic and indigenous medical systems belon to genus *Withania* which consist of 26 species having family Solanaceae. According to Ayurveda, varied medicinal properties are attributed to different parts of plant. It possesses anti-inflammatory, antipurgative, alexipharmic, somniferous treat to neurological disorder, respiratory system, cardiovascular system, gastric activity, leucoderma, ricketsia, hypnotic activity, rheumatism, senility, impotency, loose teeth, bone weakness, muscle weakness, tension, thirst, emaciation, debility, etc. Pharmacologically and medicinally important chemical such as withanin, being an alkaloid has strong effect on human body for trating various ailment.

**REFERENCES**


