PJN
ISSN 1680-5194

PAKISTAN JOURNAL OF NUTRITION

ANSInet
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan
Mob: +92 300 3008585, Fax: +92 41 8815544
E-mail: editorpjn@gmail.com

Pakistan Journal of Nutrition 9 (11): 1122-1123, 2010
ISSN 1680-5194

Monograph of *Withania somnifera* (L.) Dunal

M. Akram[1], S.M. Ali Shah[4], E. Mohiuddin[2], Abdul Hannan[3] and Khan Usmanghani[3]
[1]Department of Basic Medical Sciences, [2]Department of Surgery and Allied Sciences
[3]Department of Pre-Clinical Sciences,
Faculty of Eastern Medicine, Hamdard University, Karachi, Pakistan
[4]Department of Conventional Medicine, Islamia University, Bahawalpur, Pakistan

***Withania somnifera* (L.) Dunal**

Tibbi name	:	Asgand
English name	:	Winter Cherry
Botanical name	:	*Withania somnifera* Dunal
Family	:	Solanaceae
Parts used	:	Root, tubers, seeds, leaves, fruit

Fig. 1: *Withania somnifera* fruit

Fig. 2: *Withania somnifera* root

Description: The plant is cultivated as an annual crop and this herb is found growing wild in Pakistan. Asgandh plant is erect, 30-150 cm high with fleshy roots which is whitish brown in color. Leaves are simple and ovate. Flowers look like lucid-yellow or greenish and it contains small berries which is orange-red in color. Fruits are orange-red, containing many seeds. Florescence occurs in fall and spring (Davis and Kuttan, 2000).

Active constituents: Withaferin A and withanolide D (Bhattacharya *et al*., 1997). Anaferine (alkaloid), anahygrine (alkaloid), beta-sisterol, chlorogenic acid (in leaf only), cysteine (in fruit), cuscohygrine (alkaloid), iron, pseudotropine (alkaloid), scopoletin, somniferinine (alkaloid), somniferiene (alkaloid), tropanol (alkaloid), withanine (alkaloid), withananine (alkaloid) and withanolides A-Y(steroidal lactones), somniferine, somnine, pseudo-withanine, tropine, pseudo-tropine, 3-a-gloyloxytropane, cuscohygrine, isopelletierine, anahydrine, sitoindoside VII and sitoindoside VIII (Chaurasia *et al*., 2000). Pseudo-withanine, tropino, choline, cuscohygrine, isolettetierine, anahydrine, 3-alpha-gloyloxy tropane (Arieh and David, 1975).

Medicinal use: Abortifacient; Antiinflammatory, Adaptogen; Antibiotic; Aphrodisiac; Astringent; Deobstruent; Diuretic; Sedative; Tonic. According to Unani system of medicine, the root is bitter, tonic, aphrodisiac (Lumbreras *et al*., 2005), emmenagogue, anti-inflammatory (Kulkarni *et al*., 1991). Studies have shown asgandh to be effective in stimulating the immune system. It also appears to inhibit swelling and aid memory (Choudhary *et al*., 1995). It is especially beneficial in stress related disorders such as arthritis and premature aging (Archana and Namasivayam, 1999). Withanolides possess remarkable antitumour, antiarthritic, anti-inflammatory and immunosupressive properties (Bhattacharya *et al*., 1997). Asgandh is used for treatment of rheumatism, hyperuricemia, and as sex stimulant (Al-Hindawi *et al*., 1989). Asgandh is one of the most widespread tranquillisers used in India and Pakistan, where it holds a position of importance similar to ginseng in China and Korea (Bown, 1995). It is an anti-inflammatory agent (Tyler Varro, 1994). It is used to improve vitality and aid recovery after chronic illness. The

Corresponding Author: Muhammad Akram, Department of Basic Clinical and Medical Sciences, Faculty of Eastern Medicine, Hamdard University, Karachi, Madinat-al-Hikmah, Muhammad Bin Qasim Avenue, Karachi, Pakistan

leaves and the root bark, are deobstruent, diuretic, narcotic, strongly sedative and tonic (Uma and Akagi, 1996). It is also used to treat, debility, insomnia, impotence, infertility, multiple sclerosis etc. The seed is diuretic and hypnotic (Chopra *et al*., 1986).

Pharmacological activity: The effect of *Withania somnifera* root powder on paw volume and serum lysosomal enzyme activities was investigated in monosodium urate crystal-induced rats. The levels of β-glucuronidase and lactate dehydrogenase were also measured in monosodium urate crystal incubated Polymorphonuclear Leucocytes (PMNL). A significant increase in the level of paw volume and serum lysosomal enzymes was observed in monosodium urate crystal-induced rats. The increased β-glucuronidase and lactate dehydrogenase level were observed in untreated monosodium urate crystal incubated polymorphonuclear leucocytes. On treatment with the *Withania somnifera* root powder (500/1000 mg/kg body weight), the above changes were reverted back to near normal levels. *Withania somnifera* also showed potent analgesic and antipyretic effect with the absence of gastric damage at different dose levels in experimental rats. For comparison purpose, Non-Steroidal Anti-Inflammatory Drug (NSAID) indomethacin was used as a standard. These results provide evidence for the suppressive effect of *Withania somnifera* root powder by retarding amplification and propagation of the inflammatory response without causing any gastric damage (American Botanical Council, 1996).

REFERENCES

Al-Hindawi, M.K., I.H. Al-Deen, M.H. Nabi and M.H. Ismail, 1989. Anti-inflammatory activity of some Iraqi plants using intact rats. J. Ethnopharmacol., 26: 163-168.

American Botanical Council (trans.), 1996. The German Commission E Monographs. Austin, TX: American Botanical Council.

Archana, R. and A. Namasivayam, 1999. Anti-stressor effect of Withania somnifera, J. Ethnopharmacol., 64: 91.

Arieh Abraham Isaac Kirson and David Lavie Erwin Glotte, 1975. The withanolides of *Withania somnifera* chemotypes I and II. Phytochemistry, 14: 189-194.

Bhattacharya, S.K., K.S. Satyan and S. Ghosal, 1997. Antioxidant activity of glycowithanolides from *Withania somnifera*. Int. J. Exp. Biol., 35: 236-239.

Bown, D., 1995. Encyclopaedia of Herbs and their Uses. Dorling Kindersley, London, ISBN 0-7513-020-31

Chaurasia, S.S., S. Panda and A. Kar, 2000. *Withania somnifera* root extract in the regulation of lead-induced oxidative damage in the male mouse. Pharmacol. Res., 41: 663-666.

Chopra, R.N., S.L. Nayar and I.C. Chopra, 1986. Glossary of Indian Medicinal Plants. Council of Scientific and Industrial Research, New Delhi, India.

Choudhary, M.I., Z. Dur-e-Shahwar, A. Parveen, I. Jabbar and Ali Atta-Ur-Rahman, 1995. Antifungal steroidal lactones from Withania coagulance. Phytochemistry, 40: 1243-1246.

Davis, L. and G. Kuttan, 2000. Immunomodulatory activity of *Withania somnifera*. J. Ethnopharmacol., 71: 193-200.

Kulkarni, R.R., P.S. Patki, V.P. Jog, S.G. Gandage and B. Patwardhan, 1991. Treatment of osteoarthritis with a herbomineral formulation: a double-blind, placebo-controlled, cross-over study. J. Ethnopharmacol., 33: 91-95.

Lumbreras, B., E. Pascual and J. Frasquet, 2005. Analysis for crystals in synovial fluid: Training of the analysts results in high consistency. Ann. Rheum Dis., 64: 612-615.

Tyler Varro,1994. Herbs of Choice: The Therapeutic Use of Phytomedicinals. Haworth Press, New York.

Uma, D.P. and K. Akagi, V. Ostapenko, Y. Tanaka and T. Sugihara, 1996. Withaferin-A: A new radiosensitizer from the Indian medicinal plant *Withania somnifera*. Int. J. Radiation Biol., 69: 193-197.