

# DIABETES & NEEM

## Overview

With its extremely bitter properties, neem has been a cornerstone of Ayurvedic therapy for *pitras*, or disorders caused by overeating sweets. As the tale is told, when an Indian manufacturer applied for government of a neem capsule to treat diabetes, it was approved in 24 hours. After almost 4,500 years of almost continuous use, even the Indian equivalent of the FDA apparently believes that "anything from neem has to be good," according to Robert Larson, one of the first Americans to recognize the value of neem.

Some of the earliest reports on neem, dating back to a 1973 report in *Medicine and Surgery* (not available online), indicated that insulin requirements could be cut by up to 50 percent for patients who take five grams of neem leaf daily. Several other studies undertaken before the advent of the internet made data accessible confirm that report in humans.

More recent studies have focused on animals, primarily diabetic mice and rabbits. One study [http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list\\_uids=10919098&query\\_hl=18&itool=pubmed\\_docsum](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10919098&query_hl=18&itool=pubmed_docsum) indicates that neem leaf had a hypoglycemic effect comparable to the prescription drug glibenclamide, and noted that neem might be beneficial in preventing or delaying the onset of the disease.

## CAUTION

Insulin-dependent diabetics must still monitor blood sugar levels carefully when supplementing with neem. Neem may cause significant increases in blood sugar levels and continuing insulin at the same dose may result in hypoglycemia.

## Recent Research

[Indian J Physiol Pharmacol](#). 2006 Jul-Sep;50(3):241-9.

**Effect of aqueous extract of neem (*Azadirachta indica*) leaves on offensive and defensive gastric mucosal factors in rats.**

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[http://www.ncbi.nlm.nih.gov/pubmed/17193895?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/17193895?ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum)

Standardized aqueous extract of Neem (*Azadirachta indica*) leaves (AIE) has been reported to show both ulcer protective and ulcer healing effects in normal as well as in diabetic rats. To study the mechanism of its ulcer protective/healing actions, effects of AIE (500 mg/ kg) was studied on various parameters of offensive acid-pepsin secretion in 4 hr pylorus ligation, pentagastrin (PENTA, 5 microg/kg/hr)-stimulated acid secretion and gastric mucosal proton pump activity and defensive mucin secretion including life span of gastric mucosal cells in rats.

AIE was found to inhibit acid-pepsin secretion in 4 hr pylorus ligated rats. Continuous infusion of PENTA significantly increased the acid secretion after 30 to 180 min or in the total 3 hr acid secretion in rat stomach perfusate while, AIE pretreatment significantly decreased them. AIE inhibited the rat gastric mucosal proton pump activity and the effect was comparable with that of omeprazole (OMZ). Further, AIE did not show any effect on mucin secretion though it enhanced life span of mucosal cells as evidenced by a decrease in cell shedding in the gastric juice. Thus, our present data suggest that the ulcer protective activity of AIE may be due to its anti-secretory and proton pump inhibitory activity rather than on defensive mucin secretion. Further, acute as well as sub acute toxicity studies have indicated no mortality with 2.5 g/kg dose of AIE in mice and no significant alterations in body or tissues weight, food and water intake, haematological profile and various liver and kidney function tests in rats when treated for 28 days with 1 g/kg dose of AIE.

PMID: 17193895 [PubMed - indexed for MEDLINE]

[J Altern Complement Med.](#) 2004 Apr;10(2):369-78.

Comment in:

[J Altern Complement Med.](#) 2004 Apr;10(2):223-5.

### **Role of selected Indian plants in management of type 2 diabetes: a review.**

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[http://www.ncbi.nlm.nih.gov/pubmed/15165418?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/15165418?ordinalpos=2&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum)

Type 2 diabetes has become a global epidemic. Modern medicines, despite offering a variety of effective treatment options, can have several adverse effects. Ayurveda, a science that uses herbal medicines extensively, originated in India. Of considerable interest is the adoption of Ayurveda by the mainstream medical system in some European countries (e.g., Hungary), emphasizing this modality is increasing worldwide recognition. From ancient times, some of these herbal preparations have been used in the treatment of diabetes. This paper reviews the accumulated literature for 10 Indian herbs that have antidiabetic activity and that have been scientifically tested. Few of these herbs, such as *Momordica charantia*, *Pterocarpus marsupium*, and *Trigonella foenum graecum*, have been reported to be beneficial for treating type 2 diabetes. Mechanisms such as the stimulating or regenerating effect on beta cells or extrapancreatic effects are proposed for the hypoglycemic action of these herbs.

PMID: 15165418 [PubMed - indexed for MEDLINE]

[Indian J Exp Biol.](#) 2004 Apr;42(4):389-97.

### **Effect of *Bacopa monniera* and *Azadirachta indica* on gastric ulceration and healing in experimental NIDDM rats.**

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[http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list\\_uids=15088689&query\\_hl=18&itool=pubmed\\_docsum](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=15088689&query_hl=18&itool=pubmed_docsum)

Gastric ulcers were induced in normal/NIDDM rats by various physical (2 hr cold restraint stress and 4 hr pylorus ligation) and chemical agents (ethanol, 1 ml/200 g, oral, 1 hr before; aspirin, 200 mg/kg, oral, 4 hr) and duodenal ulcers were induced by cysteamine (40 mg/200 g). Ulcer healing activity was studied in gastric ulcers induced by acetic acid (50%) and HCl (0.6 M). The result indicated that in both, normal and NIDDM rats, *B. monniera* extract (BME, 20-100 mg/kg) did not show any significant effect on blood glucose level, while *A. indica* (AIE, 250-1000 mg/kg) significantly decreased it. However, both BME (50 mg/kg) and AIE (500 mg/kg) showed significant anti-ulcer and ulcer-healing activities in normal and NIDDM rats. Further, the present results also indicated that the ulcer protective effects of BME was more pronounced in non-diabetic, while that of AIE was more in NIDDM rats. The anti-ulcer and ulcer-healing activities of BME and AIE may be due to their effects on various mucosal offensive and defensive factors, and correction of blood sugar level by AIE may help to have more ulcer protective effect in NIDDM rats.

PMID: 15088689 [PubMed - indexed for MEDLINE]

[J Ethnopharmacol.](#) 2004 Feb;90(2-3):185-9.

### **Protective role of extracts of neem seeds in diabetes caused by streptozotocin in rats.**

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[http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list\\_uids=15013179&query\\_hl=18&itool=pubmed\\_docsum](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=15013179&query_hl=18&itool=pubmed_docsum)

Effect of petroleum ether extracts of kernel (NSK) and husk (NSH) of neem (*Azadirachta indica* A. Juss, Meliaceae) seeds on the prevention of oxidative stress caused by streptozotocin (STZ) was investigated. Diabetes mellitus was induced in adult male Wistar rats after administration of STZ (55 mg/kg b.wt., i.p., tail vein). The effect of NSK (2 gm/kg, b.wt.) and NSH (0.9 gm/kg, b.wt.) orally for 28 days was investigated in diabetic rats. Insulin-treated diabetic rats (6 U/kg, i.p., 28 days.) served as positive control. Diabetic rats given normal saline served as diabetic control. Rats that neither received STZ nor drugs served as normal control. Serum creatine phosphokinase (CPK) increased in diabetic rats was significantly decreased on insulin, NSK, and NSH treatments. The decrease in activities of superoxide dismutase (SOD) and catalase (CAT) and increase in lipid peroxidation (LPO) of erythrocytes as observed in diabetes was regained after insulin, NSH, and NSK treatments. However, there was insignificant improvement in SOD, CAT, and LPO of kidney on NSK and NSH treatment. In spite of increased CAT and SOD activities in liver and heart, LPO was also increased in diabetic rats. Insulin, NSH, and NSK treatments significantly protected animals from cardiac damage but not hepatic. Results suggest that NSH and NSK prevent oxidative stress caused by STZ in heart and erythrocytes. However, no such preventive effect was observed on renal and hepatic toxicity.

PMID: 15013179 [PubMed - indexed for MEDLINE]

[Indian J Exp Biol.](#) 2003 Jun;41(6):636-40.

**Lowering of blood sugar by water extract of *Azadirachta indica* and *Abroma augusta* in diabetes rats.**

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[http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list\\_uids=15266913&query\\_hl=1&itool=pubmed\\_docsum](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=15266913&query_hl=1&itool=pubmed_docsum)

Combination (1:1 ) of water extract of dried powder of root and leaves (200 mg/kg body wt) of *A. augusta* and *A. indica* respectively was administered orally to alloxan diabetic rats once a day for 8 weeks. This treatment caused significant lowering of blood sugar in fasted as estimated by glucose tolerance test. The treatment resulted in a significant reduction in serum lipids. Aqueous extract also decreased the formation of lipid peroxides estimated as thiobarbituric acid reactive substance, (TBARS), and increased antioxidants (superoxide dismutase, catalase, glutathione peroxidase and glutathione transferase) in erythrocytes. There was reduction in LPO as TBARS in heart, liver, kidney, and muscles. It also prevented decrease in body weight. Present study showed that *Abroma augusta* roots and *A. indica* leaves when given together as water extract had hypoglycaemic action and had better effect than given alone.

PMID: 15266913 [PubMed - indexed for MEDLINE]

[Indian J Physiol Pharmacol.](#) 2000 Jan;44(1):69-74.

**A study of hypoglycaemic effects of *Azadirachta indica* (Neem) in normal and alloxan diabetic rabbits.**

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[http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list\\_uids=10919098&query\\_hl=18&itool=pubmed\\_docsum](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10919098&query_hl=18&itool=pubmed_docsum)

Hypoglycaemic effect was observed with *Azadirachta indica* when given as a leaf extract and seed oil, in normal as well as diabetic rabbits. The effect, however, was more pronounced in diabetic animals in which administration for 4 weeks after alloxan induced diabetes, significantly reduced blood glucose levels. Hypoglycaemic effect was comparable to that of glibenclamide. Pretreatment with *A. indica* leaf extract or seed oil administration, started 2 weeks prior to alloxan, partially prevented the rise in blood glucose levels as compared to control diabetic animals. The data suggests that *A. indica* could be of benefit in diabetes mellitus in controlling the blood sugar or may also be helpful in preventing or delaying the onset of the disease.

PMID: 10919098 [PubMed - indexed for MEDLINE]

[J R Soc Health.](#) 1993 Aug;113(4):190-4.

**Exploration of the frontiers of tradomedical practices: basis for development of alternative medical healthcare services in developing countries.**

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[http://www.ncbi.nlm.nih.gov/pubmed/8410912?ordinalpos=6&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed\\_ResultsPanel.Pubmed\\_RVDocSum](http://www.ncbi.nlm.nih.gov/pubmed/8410912?ordinalpos=6&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVDocSum)

The study is a brief exploration of the functions and roles of the traditional healers in the total health care delivery system as a basis for tapping the salient features of this age old art: for the purpose of refining, and establishing it as an alternative medical health-care service. The investigation is considered relevant particularly in the developing countries where, in addition to the dearth of orthodox medical services, institutions and personnel, it is relatively cheaper, socio-culturally accessible and acceptable. Refining and developing some aspects of the traditional healers' services will serve the interest of the health consumers whose main concern is with service and not the source. Furthermore, it is hoped that the study will stimulate purposeful discussions on the need for an unbiased examination of the materials, methods and techniques of the traditional healers including, eventually, compiling a native pharmacopoeia. A more comprehensive account of the traditional healers contributions to the battle against diseases and maintenance of health and well being is envisaged.

PIP: In traditional healing, practitioners use barks, leaves, nuts, fruit juices and roots, and parts of domestic animals. They practice their craft mostly in Africa, Asia, and other Third World countries, and they are variously called juju priests, diviners, herbalists, and witch doctors. Cases of achievements in their contributions to preventive and curative health have been documented. In Nigeria, clients regularly patronize both orthodox and traditional medical practitioners. Their remedies include healing the bite of the very poisonous carpet viper, chronic bronchitis, peptic ulcer, and heart problems, as well as performing uvulectomy and tonsillectomy. Quinine, the cure for malaria, was originally the ritual medicine of the Incas of Peru. It was confirmed that *Azadirachta Indica* (Meliaceae), the neem tree, used against malaria in Nigeria, India, and Asia, had a potent antiplasmodial activity. The plant *Streblus asper*, Linn (*Shakhotoha Siora*) is well known in Indian Ayurvedic medicine to treat fever, filariasis, dysentery, and diarrhea. The alkaloids derived from the Madagascan periwinkle *Catharanthus roseus* (Apocynaceae), used in a West Indian remedy for diabetes mellitus, have antitumor activity. The drug Maytensine, obtained from *Mytenus ovatus* Loes (Celastraceae), was found to be a powerful antitumor agent in animals. Tea made from the leaves of *Osyris wightiana* stimulated the flow of breast milk and also acted as a labor-inducing agent. *Saponaria officinalis* and *Enterobium cyclocarpum* are both used in Egypt and Tanzania as spermicide contraceptives. A 1985 survey in Cross River State, Nigeria, demonstrated that 165 (61%) of respondents went to traditional healers for treatment. Part of their continued popularity is the person-centered approach that is virtually lacking in orthodox hospitals, although this humanistic approach to therapy is gradually gaining inroads into Western medical education. The services of both kinds of medicine could be harmonized by open-minded appraisal, identification of positive aspects, and acceptance of their complimentary nature.

PMID: 8410912 [PubMed - indexed for MEDLINE]

[J Ethnopharmacol.](#) 1986 Jul;17(1):95-8.

**Effect of Neem seed oil on the blood glucose concentration of normal and alloxan diabetic rats.**

**Dixit VP, Sinha R, Tank R.**

[http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list\\_uids=3762197&query\\_hl=18&itool=pubmed\\_docsum](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3762197&query_hl=18&itool=pubmed_docsum)

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