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## The White Paper Series – Paper 1

### **Antiviral compounds in neem (*Azadirachta indica*)**

***By John Conrick***

For more than 5,000 years, Ayurvedic healers have depended upon the neem tree to treat various illnesses. In Sanskrit, neem is translated as "nimba" and becomes the basis of an ancient saying "nimbativasthyamdadati," or "Neem, to give good health." Another ancient name is "Sarvo Roga Nivarins," or "the curer of all ailments."

Today, Hindu rituals call for drinking neem tea as part of the festival of Gudi-Padvo, which is celebrated in late March when Spring begins. In a hot and humid climate like India, Summer is the season when people traditionally contract fevers and flu. Indians still call neem "The Village Pharmacy" and use it to treat many ailments that continue to challenge modern medicine, including viruses like the flu and common cold.

Modern research is confirming those traditional uses. And while none of it specifically focuses on human beings with colds or flu, universities from Bangalore to Baltimore are reporting exciting results in treating the viruses that cause disorders ranging from genital herpes to dengue fever.

One of the first modern reports of neem being used as a medicinal herb focuses on the use of a neem leaf extract as an effective antiviral published in a 1969 article in the Indian Journal of Medical Research. Although the exact mechanism by which neem works is still undetermined, several studies seem to show that it interferes with reproduction of the virus, making it difficult for it to infect its host.

Nearly 20 years later, research at Johns Hopkins University in Baltimore showed that neem "provided significant protection" against the herpes simplex virus-2 in mice infected with the highly infectious virus. (Contraception. 1997 Nov; 56(5):329-35)

More recently, a 2002 study reports that neem leaf extract inhibits the growth of Dengue virus, type 2, a viral hemorrhagic fever related to Ebola. Symptoms of viral fevers include malaise, headache, sore throat, abdominal pain, vomiting, diarrhea, fever and hemorrhaging, typically followed by multiorgan failure and bleeding. The study used water extracts of neem at maximum non-toxic concentrations. In vitro (test tube) tests showed it completely inhibited the virus. In vivo tests conducted on mice showed the neem extract resulted in inhibition of the virus as confirmed by the absence of symptoms. (Journal of Ethnopharmacology, 2002 Feb; 79(2):273-8).

Another study of "in vitro" tests indicates that neem leaf extract inactivated and interfered with the reproduction of the coxsackie B virus, one of a group of enteroviruses that are second only to the "common cold" as the most infectious viral agents in humans. The enteroviruses cause an estimated 10 to 15 million or more symptomatic infections a year in

the United States. In the study, neem leaf extract inhibited plaque formation in six types of the Coxsackie virus at concentrations of 1000 micrograms per milliliter. The reports note that the neem leaf extract was most effective as a virucidal agent, and also interfered with the virus's reproductive cycle at an early stage. Additionally, researchers say the evidence suggests that the entire "battery" of compounds in neem have antiviral action for the coxsackie B group of viruses. (Indian Journal of Experimental Biology, 1998 Nov; 36(11):1151-3).

The Indian Journal of Experimental Biology also reported that neem "significantly enhanced" antibodies against the Newcastle Disease virus - a highly contagious and generally fatal disease affecting all species of birds. The chickens in the study had been naturally infected with infectious bursal disease (IBD), a devastating virus that causes an immuno-suppressive disease in chickens. IBD is a major economic problem in most of the world, so increased antibodies against highly infectious viruses like Newcastle Disease are critically important. (Indian J Exp Biol. 1998 Nov; 36(11):1151-3)

Along with neem's proven ability as an antiviral agent, it also is a highly effective immune system booster. In fact, it's so effective that many researchers attribute its contraceptive properties - in both men and women - to an enhanced immune system. While scientists have not yet determined specifically how neem works, they do know it carries a one-two-three punch, boosting both the lymphocytic and cell-mediated immune systems, at the same time it kills or slows the growth of many disease-causing organisms such as bacteria, virus and fungus.

***John Conrick is president and founder of the Neem Association, and author of the book *Neem: The Ultimate Herb*. For more information, visit [www.neemamerica.org](http://www.neemamerica.org)***