



Review Paper

Neem (*Azadirachta indica* A. Juss) - A Nature's Drugstore: An overview

Imam Hashmat^{1*}, Hussain Azad² and Ajj Ahmed³

¹Department of Preventive and Social Medicine, National Institute of Unani Medicine, Bangalore, INDIA

²Department of Moalajat, National Institute of Unani Medicine, Bangalore, INDIA

³Department of Ilmul Advia, National Institute of Unani Medicine, Bangalore, INDIA

Available online at: www.isca.in

Received 25th August 2012, revised 31st August 2012, accepted 1st September 2012

Abstract

In traditional medicine most of the diseases have been treated by administration of plant or plant product. *Neem* (*Azadirachta indica* A. Juss) is the most useful traditional medicinal plant in India. Each part of the neem tree has some medicinal property. During the last five decades, apart from the chemistry of the neem compounds, considerable progress has been achieved regarding the biological activity and medicinal applications of neem. It is now considered as a valuable source of unique natural products for development of medicines against various diseases and also for the development of industrial products. This review gives a bird's eye view mainly on the biological activities of the neem and some of their compounds isolated, pharmacological actions of the neem extracts, clinical studies and plausible medicinal applications of neem along with their safety evaluation.

Keywords: Traditional medicine, *azadirachta indica*, pharmacological action, biological activity.

Introduction

Azadirachta indica commonly known as neem, is native of India and naturalized in most of tropical and subtropical countries are of great medicinal value and distributed widespread in the world. The chemical constituents contain many biologically active compounds that can be extracted from neem, including alkaloids, flavonoids, triterpenoids, phenolic compounds, carotenoids, steroids and ketones, biologically most active compound is azadirachtin, it is actually a mixture of seven isomeric compounds labelled as azadirachtin A-G and azadirachtin E is more effective¹. Other compounds that have a biological activity are salannin, volatile oils, meliantriol and nimbin². The importance of the neem tree has been recognized by the US National Academy of Sciences, which published a report in 1992 entitled 'Neem - a tree for solving global problems'. The advancement of neem research has earlier been documented³.

Taxonomical classification⁴: The taxonomic classification of neem is as follows: Kingdom : Plantae, Order: Rutales, Suborder: Rutinae, Family: Meliaceae, Subfamily : Melioideae, Tribe : Melieae, Genus : *Azadirachta*, Species: *indica*,

Vernacular names⁵: Bengali: Nim, Nimgachh, Gujarati: Danujhada, Limbado, Limbra, Limdo, Hindi : Nim, Nimb, Sanskrit : Arista, Nimba, Nimbah, Picumarda, English : Indian Lilac, Margosa tree, Neem tree, Kannada: Bemu, Bevinamara, Bivu, Kaybevu, Punjabi : Bakam, Drekh, Nim.

Distribution: A native to east India and Burma, it grows in much of south East Asia and West Africa, and more recently Caribbean and south and Central America. In India it occurs

naturally in Siwalik Hills, dry forests of Andhra Pradesh, Tamil Nadu and Karnataka to an altitude of approximately 700 m. It is cultivated and frequently naturalized throughout the drier regions of tropical and subtropical India, Pakistan, Sri Lanka, Thailand and Indonesia. It is also grown and often naturalized in Peninsular Malaysia, Singapore, Philippines, Australia, Saudi Arabia, Tropical Africa, the Caribbean, Central and South America⁵.

Botanical description: It is a tree 40-50 feet or higher, with a straight trunk and long spreading branches forming a broad round crown; it has rough dark brown bark with wide longitudinal fissures separated by flat ridges. The leaves are compound, imparipinnate, each comprising 5-15 leaflets. The compound leaves are themselves alternating with one another. It bears many flowered panicles, mostly in the leaf axils. The sepal are ovate and about one cm long with sweet scented white oblanceolate petals. It produces yellow drupes that are ellipsoid and glabrous, 12-20 mm long. Fruits are green, turning yellow on ripening, aromatic with garlic like odour. Fresh leaves and flowers come in March-April. Fruits mature between April and August depending upon locality⁵⁻⁶.

Phytochemistry: Biologically active principles isolated from different parts of the plant include: Azadirachtin, meliacin, gedunin, nimbidin, nimbolides, salannin, nimbin, valassin, meliacin forms the bitter principles of *Neem* oil, the seed also contain tignic acid responsible for the distinctive odour of the oil⁷. Neem kernels contain 30-50 % of oil mainly used by the soap, pesticide and pharmaceutical industries and contain many active ingredients which are together called triterpene or limnoids⁸. The four best limnoids compounds are: Azadirachtin,