



Asian Journal of Plant Sciences

ISSN 1682-3974

science
alert

ANSI*net*
an open access publisher
<http://ansinet.com>

Investigation of Compounds from *Azadirachta indica* (Neem)

Mohammad Mehdi Sadeghian and Forough Mortazaienezhad
Department of Horticulture, Azad University, Khorasgan Branch, Isfahan, Iran

Abstract: *Azadirachta indica* A. Juss. (neem) is a source of several bioactive components, however only Azadirachtins have been commercially exploited. A quantitative HPLC analysis of the components present in an aqueous extract of powdered neem leaves prepared in the traditional manner was undertaken. This study indicate that aqueous extracts contain Azadirachtin A, B, D, H, I, Desacetylnimbin, Azadiradione, Nimbin, Salanin, Azadirone, Nimbolin, Nimbinene, Nimbolide. Neem leaves extract have been used for pesticide, fertilizer, corrosion inhibition and biosorbent for dyes.

Key words: *Azadirachta indica*, neem, aqueous extract

INTRODUCTION

Neem (*Azadirachta indica* A. Juss.) plant has been used extensively in Asian and African subcontinent mainly to tap its medicinal and agrochemical properties since ancient times (srivastava and Prakash, 2006).

Neem (*Azadirachta indica* A. Juss) is a large, evergreen, hardy tree, native to the Indian sub-continent (Usher, 1984; Chari, 1996; Gajalakshmi, 2002). It grows easily and survives even on dry, nutrient-lean soils (Pundt, 2000). It has been popular, even revered, in the Indian sub-continent. It is friendly to other vegetation but repels insects (Arora, 1996; Kumar, 2002). Its leaves and fruit-both exceedingly bitter-are known to possess fungicidal and nematicidal properties (Schmutterer, 1995; Parveen and Alam, 1996; Pundt, 2000). In recent years, neem has attracted global attention due to its potential as a source of natural drugs and also environment-friendly pesticides (Schmutterer, 1995; Agarwal, 1996; Alam, 1996; Randhawa and Parmar, 1996; Mulla and Su, 1999; Joshi and Lockwood, 2000; Daniel, 2000; Kumar, 2002; Gajalakshmi and Abbasi, 2004). But, one major problem is what does the compounds in neem leaves extraction?

The present study was initiated to investigate quantitative triterpenoids composition of neem.

MATERIALS AND METHODS

The leaves of *Azadirachta indica* were collected in June 2006 from Lar, Iran and identified by assistant professor Dr. F. Mortazaienezhad, Department of Horticulture, Azad University, Khorasgan Branch.

Powdered neem leaves (5 kg) were taken in a cotton cloth bag, placed in a vessel containing (10 L) water and soaked overnight. The water layer was decanted and the bag was completely squeezed in a hand press to give the aqueous extract and then soaked in MeOH overnight. The MeOH extract was filtered and solvent removed to yield a viscous liquid the extract subjected to HPLC analysis for the estimation of components.

RESULTS AND DISCUSSION

Results in Table 1 indicate that aqueous extract of neem leaves contain bioactive compounds for insect control, antioxidant activity, biosorbent for dyes, fertilizer and corrosion inhibition. The major bioactive compounds in neem leaves extracts are Salanin, Nimbin, Azadirone and Azadirachtins. There was no correlation of either Nimbin or Salanin to Azadirachtin concentration (Behl *et al.*, 2004). All of compounds in Table 1 are active as insect control but the most active ones are Azadirachtin A, Azadirachtin B and Salanin.

Table 1: Components in the aqueous extract of neem leaves

Compound	Percent in extraction
Azadirachtin A	1.30
Azadirachtin B	1.62
Azadirachtin D	1.12
Azadirachtin H	0.26
Azadirachtin I	0.45
Desacetylnimbin	2.34
Azadiradione	0.32
Nimbin	2.60
Salanin	5.60
Nimbolin	1.45
Nimbolide	2.20
Nimbinene	1.23
Azadirone	2.46
Other	77.05

REFERENCES

- Agarwal, A., 1996. What's in a neem? Down to Earth, 14: 27-38.
- Alam, M.M., 1996. Bioactivity Against Phytonematodes. In: Neem. New Age International, Randhawa, N.S. and B.S. Parmar (Eds.), pp: 171-191.
- Arora, R.K., 1996. Genetic Diversity and Ethno Botany. Randhawa, N.S. and B.S. Parmar, (Eds.), Neem. New Age International, pp: 33-37.
- Behl, H.M., O.P. Sidhu and V. Kumar, 2004. Variability in triterpenoids (nimbin and salanin) composition of neem among different provenances of India, Industrials Crops and Products, pp: 69-75.
- Chari, M.S., 1996. Neem and Transfer of Technology. In: Neem and Environment. Sinh, R.P., M.S. Chari, A.K. Raheja and W. Kraus (Eds.), I. Oxford and IBH Publishing Co., pp: 27-38.
- Daniel, J.N., 2000. Studies on EM based farming practices for small farmers in India. In: Proceedings of the International Conference on Kyusei Nature farming, Pyongyang, Democratic People's Republic of Korea, BAIF Development Research Foundation.
- Gajalakshmi, S., 2002. Development of methods for the treatment and reuse of municipal and agricultural solid wastes appropriate for rural/urban households. Ph.D Thesis, Pondicherry University, Pondicherry, pp: 187.
- Gajalakshmi, S. and S.A. Abbasi, 2004. Neem leaves as a source of fertilizer-cum-pesticide vermicompost. Bioresource Technology, 92: 291-296.
- Joshi, P.C. and J.A. Lockwood, 2000. Antifeedent effect of aqueous extract of neem (*Azadirachta indica* A. Juss) leaves on *Oxya velox* F. (Orthoptera: Arididae). J. Agric. Urban Entomol., 17: 21-26.
- Kumar, U., 2002. Neem as a potential biopesticide and soil conditioner. Agrobios Newsletter, 1: 8-12.
- Mulla, M.S. and T. Su, 1999. Activity and biological effects of neem products against arthropods of medical and veterinary importance. Journal of the American Mosquito Control Association, 15: 133-152.
- Parveen, G. and M.M. Alam, 1996. Bioactivity Against Plant Pathogens. Randhawa, N.S., B.S. Parmar (Eds.), Neem. New Age International, pp: 192-201.
- Pundt, L., 2000. Neem based insecticides. Home and Garden News. July/August, pp: 6.
- Randhawa, N.S. and B.S. Parmar, 1996. Introductory. Randhawa, N.S. and B.S. Parmar (Eds.), Neem. New Age International, New Delhi, pp: 1-5.
- Schmutterer, H., 1995. In: The Neem Tree *Azadirachta indica* (A. Juss) and Other Meliaceous Plants: Sources of Unique Natural Products for Integrated Pest Management, Medicine, Industry and Other Purposes. VCH Verlagsgesellschaft mbH, Weinheim, Germany, pp: 696.
- Srivastava, K. and G. Prakash, 2006. Azadirachtin production in stirred tank reactors by *Azadirachta indica* suspension culture. Process Biochemistry (2006), doi: 10.1016/j.procbio. 2006.06.020.
- Usher, G., 1984. A Dictionary of Plants Used by Man. CBS Publishers and Distributors, India.