



National Research Development Corporation

Technology Offer

EXTRACTION OF AZADIRACHTIN

The Indian Neem tree (Azadirachtin Indica, Aturs) has attracted the attention of many chemists and biologists all over the world during the past two decades because of its plethora of biological activities; Azadirachtin is one of the most interesting constituents of Neem because of its influence on insect feeding behaviour and insect developments.

There are several broad-spectrum highly toxic organic synthetic insecticides currently in use, for the control of insect pests of food and commercially important crops. Besides, effectively controlling the target pests, they also destroy the natural enemies of pests and other beneficial insects. Insects also develop resistance to some of them owing to indiscrete use. There are also instances of toxic effects of residues of some of the synthetic insecticides for the consumers of the product due to poor biodegradability. Therefore, there is a need for environmentally compatible insecticides possessing activities at low concentration and selective toxicity to insect, pests, low toxicity to plants and mammals, desired stability and economic viability.

Neem trees are widely distributed in India and some regions of Asia, Africa and Australia. Neem leaves, neem seed, neem oil and neem cake are traditionally used in India from a long time for insect pest control. Of these, neem seeds constituting an annually renewable natural source are associated with highest insect pest control properties.

There are numerous examples reporting the insect anti-feedant and insect growth inhibitory properties of Azadirachtin for a variety of insect pests. Azadirachtin has also been reported to be non mutagenic and it appears to have no apparent mammalian toxicity. As a result of the above studies, Azadirachtin has been considered to be a promising environmentally compatible insect pest control device for plant protection. It has not come to commercial use because it is expensive to isolate it in a pure form from the need seed/kernel extract and it is a very complex molecule for an economical chemical synthesis. Moreover, Azadirachtin has also been found to degrade rapidly due to environmental factors such as UV radiation in sunlight, heat, air moisture, acidity and enzymes present in foliar surfaces.

PROCESS

The process developed has several advantageous over other processes, one of the major advantages is that the azadirachtin is separated out by precipitation instead of concentrating the solution by evaporation and recovery of the solvent.

The process of extraction of azadirachtin from the neem seeds kernels involves the following major steps:

- Cleaning and decortication of neem seeds
- Powdering/crushing the kernel
- Deoiling/ defatting of kernel
- Isolation of azadirachtin

- Storage of final product

NRDC

National Research Development Corporation, a Government of India Enterprise, is a premier technology Transfer Corporation with five decades of experience. It has helped establish over

one thousand projects in the small and medium scale sector. The supply of technologies and services to entrepreneurs extend both in the developing and developed countries like USA, Germany, Malaysia, Myanmar, Brazil, Nepal, Senegal, Madagascar, Indonesia, Philippines, Vietnam, Sri Lanka, Kenya, Bangladesh and Egypt.

Advantages of Indian technologies

- Low capital investment
- High employment potential
- Maximum use of local raw materials and manpower resources
- Adaptable levels of sophistication

Services offered by NRDC

- Process know-how
- Pre-investment studies
- Feasibility / project reports
- Detailed engineering
- Turn key projects
- Equity capital participation
- Training in operation of plants
- Raw materials and products testing

PLANT PARAMETERS	
Capacity (TPA Aza)	4.5
No. of shifts/day	1
Working days/Year	300
Land Required, m ²	400
Covered Area, m ²	200
MANPOWER	
Managerial	2
Skilled	2
Unskilled	4
Technicians	17
Others	13
RAW MATERIAL	
Requirement	Kg/Kg
Neem Seed	667
Solvent X	38
Solvent Y	31
Solvent Z	5
PLANT & MACHINERY	
Feed Bin, conveyor system, Decorticator, Kernel bin, Conveyor system, Oil expeller	
Nutsche Filter with accessories, Evaporator, Pumps	
ECONOMICS	
The above figures are for budgetary purpose only and subject to change in subsequent offers.	

NATIONAL RESEARCH DEVELOPMENT CORPORATION

(A GOVERNMENT OF INDIA ENTERPRISE)

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