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AN OVERVIEW AND PHARMACOGNOSTIC STUDY OF AZADIRACHTA INDICA

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ABSTRACT

The current study examines the physicochemical characteristics of Azadirachata indica (Linn). After screening different total ash values, it was discovered that the acid insoluble value was 3.47%w/w. A prominent tree in the Meliaceae family is neem (Azadirachata indica). Bark, leaves, flowers, seeds, oil, and other parts are used for a variety of foods in the Traditional System of Medicine. Numerous neem patent applications for pharmaceutical use have been filed. This review offers a thorough analysis of the phytochemistry, pharmacological activity, and pharmacognosy that have been previously published.

KEYWORD: Azadirachata indica leaves, acid insoluble ash, ash content, total ash.

I. INTRODUCTION

Pharmacognosy, the study of natural substances' therapeutic qualities, especially those of plants, has long been a mainstay of both conventional and alternative medicine. The assessment of ash values is a vital and insightful approach among the many procedures used to evaluate the quality and purity of medicinal plants.[1] The purpose of this review paper is to investigate the pharmacognosy of ash values and clarify their importance in assessing the effectiveness of therapeutic plants. Ash levels are a good indicator of the overall mineral content of plant materials because they are essentially the residue left over after combustion.[2] Assessing the medical quality and safety of herbal products requires an understanding of the existence of inorganic compounds, contaminants, and adulterants, all of which they give.[3] the assessment of ash values indicates the therapeutic efficacy and pharmacological potential of plant-based medications in addition to their purity.

II. INFORMATION

Azadirachta indica, commonly known as Neem, margosa, nimtree or Indian lilac,[3] is a tree in the mahogany family Meliaceae. It is one of two species in the genus *Azadirachta*. It is native to the Indian subcontinent and to parts of Southeast Asia, but is naturalized and grown around the world in tropical and subtropical areas. Its fruits and seeds are the source of Neem oil. *Nim* is a Hindustani noun derived from Sanskrit *nimba* (निंब).[4,5,6]

Scientific Classification of Neem→

- Kingdom :- Plantae
- Division :- Magnoliophyte
- Class :-Magnoliopsida
- Order :- Sapindales
- Family :- Meliaceae
- Genus :- Azadirachta
- Species :- indica
- Scientific name :- Azadirachta indica.[7]

III. DESCRIPTION

Neem is a very tough tree and is said to grow almost anywhere in the lowland tropics and subtropics neem is an extremely resilient tree. Although it may be grown as high as 1,500 meters, it thrives at elevations between 700 and 800 meters.[8] The margosa tree grows quickly, reaching heights of 15–20 meters (49–66 feet) and, on occasion, 35–40 meters (115–131 feet). Being evergreen, it loses a lot of its leaves in the arid winter. The branches stretch out far. The roundish, relatively dense crown can have a diameter of 20–25 m (66–82 ft). The

fruit is a smooth (glabrous), olive-like drupe that, when ripe, measures 14–28 mm (1⁄2-1+1⁄8 in) by 10–15 mm (3⁄8–5⁄8 in). Its shape varies from elongate oval to nearly roundish. The mesocarp, or bitter-sweet pulp, is highly fibrous and yellowish-white in color, whereas the exocarp, or fruit skin, is thin. The thickness of mesocarp is 3–5 mm (1/8–1/4 in). The fruit's one, occasionally two, or three elongated seeds (kernels), each with a brown seed coat, are enclosed by the fruit's firm, white endocarp.

Synonym

Bevu, Dogo'n yaro, Geed hindi, Limba, Limdo, Mahaneem, Mandvi, Margosa tree, Neem dari, Nim, Nimba, Nimboni, Nimkauli, Phak ki nin, Sadao, Sau dau, Turi forta, Vapa chettu, Vembu, Vepa, Veypa marum.[8]

Chemical Constituents

A variety of phytochemicals can be found in margosa fruit, seeds, leaves, stems, and bark. Some of these phytochemicals, such azadirachtin, were initially identified in Azadirachta seed extracts and were used as an insecticide, growth inhibitor, and antifeedant in the 1960s.[9,10] Crushing 2 kg of seeds yields roughly 5 g of azadirachtin.[9] The seed oil includes glycerides, various polyphenols, nimbolide, triterpenes, beta-sitosterol, and azadirachtin and related limonoids.[9,11] The oil is yellow, unpleasant, and smells like garlic. It has a 2% concentration of limonoid chemicals.[9,9] Quercetin, catechins, carotenes, and vitamin C are present in the leaves.[9]

Habitat Close

The Neem tree's exact origin is unknown, but it's believed to be native to South Asia. It thrives in dry forests in southern India and Burma. For thousands of years, Neem has been cultivated in various countries, including India, Pakistan, Sri Lanka, Bangladesh, Myanmar, Thailand, and parts of Indonesia. In the 19th century, it was introduced to Fiji and Mauritius.[12]

Propagation

The tree is easily propagated, both sexually and vegetatively. It can be planted from seed, seedlings, saplings, root suckers, or tissue culture. However, it is typically cultivated from seed, either immediately on the site or transplanted as seedlings from the nursery. The seeds are extremely simple to prepare. The fruit falls from the trees on its own; when wet, the pulp can be removed by rubbing against a rough surface; and (after washing with water), the clean,

white seeds are recovered. In certain countries, such as Togo and Senegal, people leave the cleaning to fruit bats and birds, which eat the sweet pulp and then spit out the seeds under the trees. Neem seeds are said to have a short shelf life. It is commonly accepted that after 2-6 months of storage, they will no longer germinate. However, recent examinations of seeds stored in France revealed that seeds without endocarp had an acceptable germinative capacity (42% after more than 5 years).[19] Botanical Description.

Microscopic Characteristics

Preparation of transverse section

To prepare a Transverse Section of a Leaf, the Leaf is first fixed in a solution to preserve its structure, then embedded in a suitable medium, such as paraffin wax or resin. Thin sections, usually around 10-20 micrometres in thickness, are then cut using a microtome and mounted on a microscope slide. The slide is then stained with a suitable dye such as safranin or toluidine blue to make the structures of the Leaf more visible under the microscope.

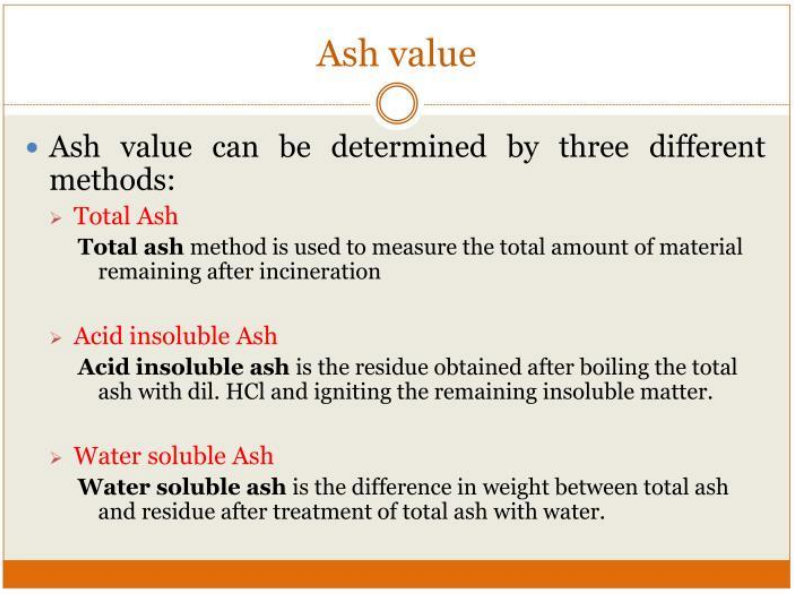
Traditional action and uses

- Bark: It has burning sensation, tumor, dyspepsia, intestinal worms, hepatopathy, cough, b ronchitis, urine incontinence, diabetes, hyperdipsia, leprosy, skin problems, eczema, leuco derma, pruritis, and tonic properties for the pectoral region.
- Leaves: This herb has antiseptic, ophthalmic, ophthalmopathy, intestinal worms, dyspepsi a, ulcer, tuberculosis, boils, eczema, malaria, and intermittent fever properties. It is also a nthelmintic, insecticidal, demulcent, and refrigerant for skin conditions, leucoderma, burn ing feeling, leprosy, and itch.
- Flowers: It is used to treat intestinal worms, colic, dyspepsia, and burning feeling, and ophthalmopathy, ophthalmic, stomachic, anthelmintic, and general debility.
- Seeds: It is used to treat tumors, leprosy, skin conditions, odontalgia, intestinal worms, w ounds, ulcers, diabetes, vulnerablity, emollient, anodyne, anthelmintic, depurative, and ut erine stimulant.
- Oil: It is used to treat leprosy, syphilitic sores, ulcers, ringworm, scabies, fever, and chron ic skin illnesses.[23,24,25,26]

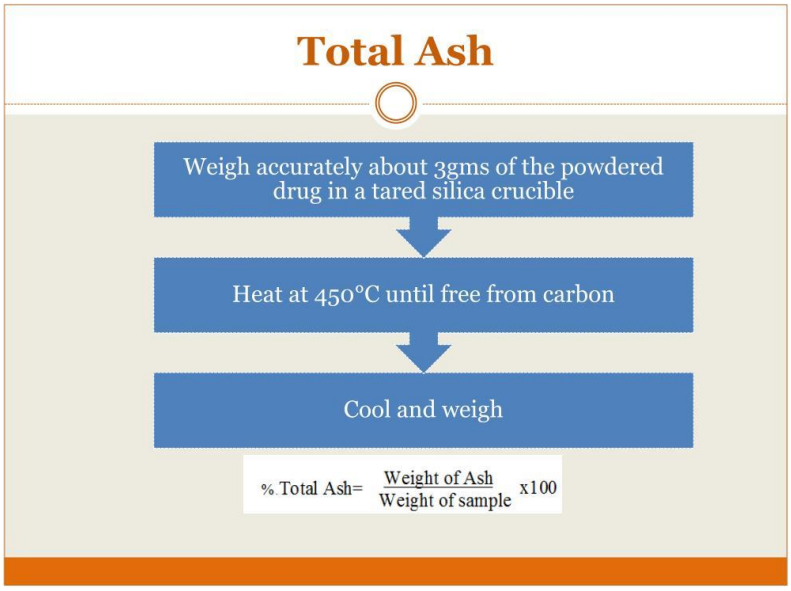
The physical and chemical characteristics of Azadirecka indica Linn. Leaves

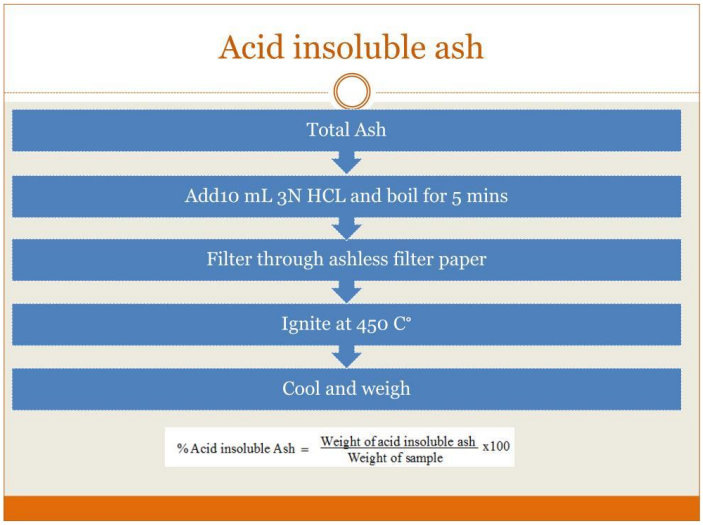
- Material and Method Collection of Plant material The newly harvested plant material was shade-dried.
- To achieve the appropriate coarseness, dried plant material was ground into a powder usin g a mechanical grinder and then run through sieve number 60.
  Additionally, this powder is used in the experiment on the ash value.

Ash content



Total ash





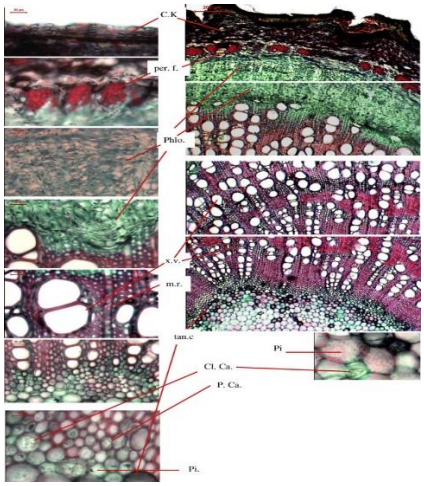
Acid-insoluble ash

IV RESULT

I. Authentication and collection of plant material

The leaves of A. indica were collected from the neighborhood of Loni B.K., Ahmednagar district, Maharashtra, India and was authorized by Dr. A. S. Wabale, Research guide, Department of Botany and Research Centre, PVP College of Arts, Science, and Commerce, Pravaranagar, Maharashtra.

II. Microscopic characteristics



T. S. of Azadirachta indica leaves.

T.S in the old stem- Cork, Pericyclic fibers, Phloem, Xylem vessels, Medullary rays, Pith, Tannin cells, Cluster of Calcium oxalate, Prism of Calcium Oxalate.

The transverse section revealed an outer dark reddish brown rhytidoma consisting of 10 to 15 rows of outermost dark brown colored cork cells, and a narrow band of stone cells lying underneath this, followed by an outer few rows of parenchyma and an inner wide 20 to 25 rows of dark orange brown colored phloem tissue; a very narrow band of phelloderm with tangentially running tannin cells and a very wide phloem with discontinuous groups of crystal fibers alternating with medullary ray Calcium oxalate crystals penetrated the parenchymatous cells.

The powder exhibits various characteristics, including a large number of fragments of rhytidoma embedded with stone cells, isolated or in groups of fibers; a few simple, oval to spherical starch grains and parenchymatous cells filled with tannin contents; a few oval to rectangular sclerides associated with idioblast containing prismatic crystals of calcium oxalate.[20,21,22]

III. Total Ash Value

GIVEN

- Empty silica crucible (W1) = 67.14 gm
- Powder weight of sample = 5 gm
- Empty silica + powder (before ignited) [W2] = 72.14 gm
- Empty silica + powder (after ignited) [W3] =67.90 gm.
- Ash weight = [w3-w1] =0.76 gm.

%TOTAL ASH = Ash weight ÷ weight of sample × 100

= 0.76 ÷ 5 ×100

= 0.152 × 100

% Total Ash	=15.2 %

IV. Acid insoluble ash

GIVEN

- Empty silica crucible (W1) = 67.14 gm.
- Powder weight of sample = 5 gm
- Acid insoluble ash weight=0.47 gm

%Acid-Insoluble Ash = Acid insoluble ash weight ÷weight of sample×100

= 0.47÷5×100

= 0.094 × 100

%Acid-Insoluble Ash = 9.4 %

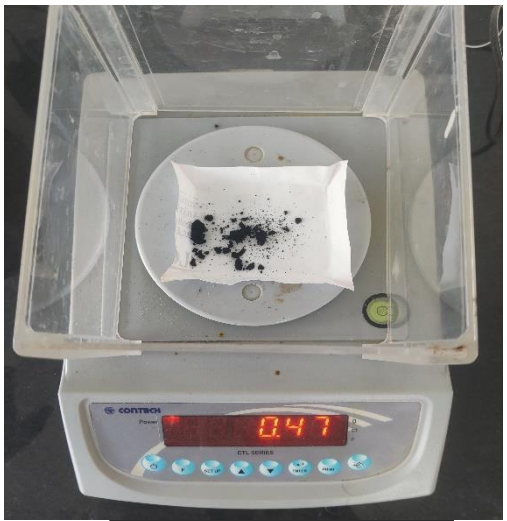
1. Powder Sample

2. Muffle Furnancer

3. after Ash

4. Add Dilute HCL

5. Filter it



6. After Drying Weigh it.

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