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Review

REVIEW STUDY ON YANAI NERUNJI /PEDALIUM MUREX AS AN DIURETIC ACTIVITY

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Abstract

Many traditional medical systems, including Ayurveda, Siddha, and folk practices, use Pedalium murex Linn. (Yanai Nerunji), a medicinal plant in the Pedaliaceae family, to treat reproductive, renal, and urinary diseases. The plant's varied pharmacological actions are attributed to its abundance of bioactive phytoconstituents, which include flavonoids, saponins, glycosides, phenolic compounds, triterpenoids, steroids, tannins, and mucilage. It has long been used as a natural diuretic and to treat kidney stones, inflammation, urinary tract infections, and dysuria. These conventional claims are supported by scientific research, which mostly uses preclinical animal models to emphasize its diuretic, nephroprotective, anti-inflammatory, antioxidant, and antibacterial properties. The material that is currently accessible on Pedalium murex's phytochemistry, traditional applications, pharmacological characteristics, and therapeutic value is compiled and examined in this review.

Keywords: Diuretic action, urinary problems, nephroprotective activity, anti-urolithiatic, phytochemistry, traditional medicine, herbal medication, Yanai Nerunji, Pedalium murex

1. INTRODUCTION

Pedalium murex Linn. (Commonly known as Anai Nerunji, Yanai Nerunji, or Gokhru) is a medicinal herb belonging to the family Pedaliaceae and is widely distributed throughout India and other tropical regions. Traditionally, different parts of the plant—including fruits, leaves, stems, and roots—have been extensively used in Ayurveda, Siddha, and folk medicine for the management of urinary, reproductive, and inflammatory disorders.[1,2,3] Phytochemical investigations reveal that the plant is rich in flavonoids, saponins, glycosides, phenolic compounds, triterpenoids, steroids, and tannins, which are responsible for its diverse therapeutic properties.[4,5,6]

One of the most important traditional applications of Pedalium murex is in the treatment of urinary disorders, where it is used to ease urination, reduce burning sensation, and support kidney function.[7,8] Scientific investigations support these traditional claims,

particularly its diuretic activity, as various extracts of the plant have been reported to significantly increase urine output and electrolyte excretion in experimental animal models.[9,10,11] Additionally, the plant has been shown to reduce inflammation and irritation in the urinary tract, providing relief in conditions such as dysuria, urinary tract infections, and urolithiasis.[12,13]. A part from its effects on the urinary system, Pedalium murex exhibits a broad spectrum of pharmacological activities, including antioxidant, anti-inflammatory, antimicrobial, anti-ulcer, and nephroprotective properties.[14] These activities have been validated mainly through preclinical studies, which demonstrate the plant's ability to scavenge free radicals, stabilize biological membranes, inhibit pathogenic microorganisms, and protect renal tissues from oxidative and inflammatory damage.[15] Such findings highlight the plant's potential as a multifunctional therapeutic agent in both traditional and modern medicinal systems.

Despite these promising pharmacological findings, most of the available evidence on Pedalium murex is derived from in vitro and animal studies, while well-designed human clinical trials remain limited.[16] Therefore, although the herb continues to be widely used in traditional medicine— especially for urinary ailments—there is a need for further scientific validation regarding standardized extracts, dosage regimens, safety profiles, and clinical efficacy.[17] Continued research in this direction will help establish Pedalium murex as an evidence-based herbal drug and strengthen its therapeutic role as a diuretic and urinary-protective natural remedy.[18]

2. DRUG OF PROFLIE

Fig1: *pedalium murex*

You are referring to Yanai Nerunji / Pedalium murex, a medicinal plant commonly studied for its diuretic activity. In review articles, the drug profile generally includes the following sections: Drug Profile of Pedalium murex (Yanai Nerunji).

2.1. Botanical Name

- Pedalium murex
- Family: Pedaliaceae

2.2. Common Names

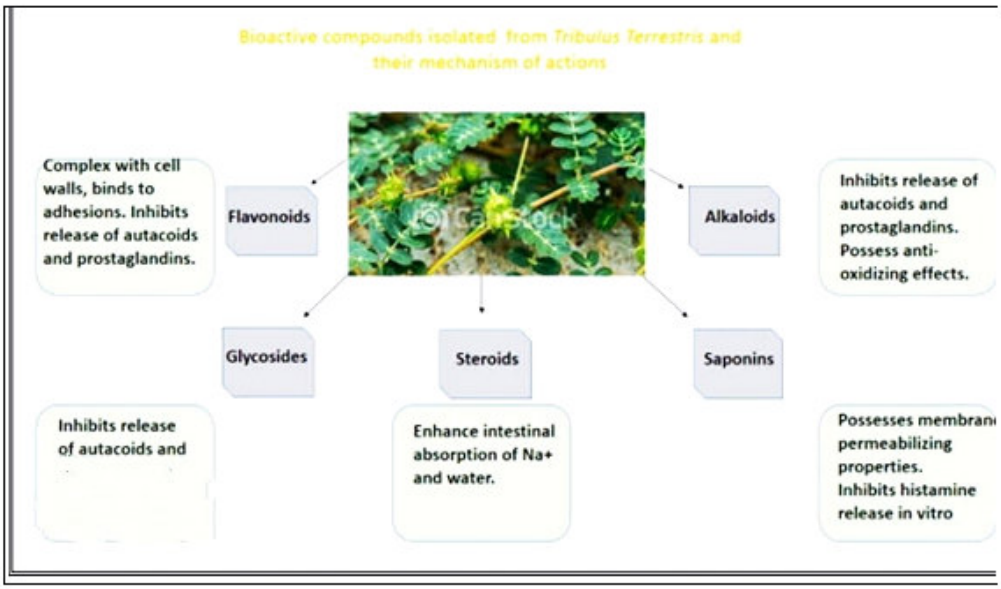
- Yanai Nerunji (Tamil)
- Gokhru, Bada Gokhru (Hindi)

Large Caltrop (English)

23. Parts Used

- Fruits (most common)
- Leaves, roots, and seeds are also used traditionally.

2.4. Phytochemical Constituents



- Flavonoids
- Saponins
- Steroids (e.g., β-sitosterol)
- Triterpenoids
- Lignans
- Mucilage Fatty oils

2.5. Pharmacological Activities Reported

- In review articles, Pedalium murex is commonly reported to have
- Anti-diuretic activity (reduces urine output)
- Anti-urolithiatic (prevents kidney stones)
- Anti-inflammatory
- Antimicrobial
- Aphrodisiac
- Renal protective activity

2.6. Anti-Diuretic Activity

Studies indicate:

- The extract may reduce urine volume in experimental models.
- Activity is linked to steroid saponins and flavonoids.
- It may act by influencing renal tubular reabsorption of water and electrolytes.

2.7. Traditional Uses (Ethnopharmacology)

- Urinary tract disorders
- Dysuria (painful urination
- Kidney stone management
- Reproductive tonic
- Anti-inflammatory uses

2.8. Toxicity / Safety

- Generally safe in traditional doses
- High doses may cause GI irritation
- Long-term toxicology data is limited[18,19,20]

3. LITERATURE

Pedalium murex L. and urinary/diuretic effects

3.1. Traditional/ethnomedicinal context

Pedalium murex (vernacular: yaanai/yanai nerunjil, bada gokharu, gokhru) is used in Ayurveda, Siddha and folk systems for urinary problems (strangury, urinary infections, kidney stones), as a demulcent and as a diuretic in traditional texts and local practice. Multiple ethnopharmacological reviews record these uses.

3.2. Phytochemistry

Phytochemical studies repeatedly report that fruits/seeds, leaves and stems contain: flavonoids, saponins, alkaloids, glycosides (including steroidal sapogenins such as diosgenin reported in some works), tannins, phenolics and mucilage. These classes are plausible contributors to urinary/renal effects (e.g.,

saponins and flavonoids often affect renal handling of electrolytes; mucilage has demulcent effects). [21]

3.3. Pharmacological evidence relevant to diuresis & urinary tract

Animal diuretic studies: Several experimental papers report that methanolic or aqueous extracts of P. murex increase urine volume and electrolyte excretion in rodents (supporting traditional diuretic claims). One peerreviewed diuretic assay (methanolic extract) found statistically significant diuresis versus control. These are typically acute pharmacology studies (single doses, small animal groups).

Renal protective / anti-urolithiatic studies: More recent work examines P. murex for prevention/dissolution of calcium oxalate crystals (anti-lithiatic) and nephroprotective effects in models of kidney injury — often reporting reduced stone formation markers, antioxidant effects and improved renal histology. These data suggest complementary mechanisms

(antioxidant/antiinflammatory + direct effects on urinary chemistry).

Mechanistic inference: No clear, well-defined molecular mechanism (e.g., specific transporter targets) has been established for diuresis. Most mechanistic suggestions in the literature are inferential: phytochemicals (flavonoids, saponins) altering renal hemodynamics or tubular electrolyte handling and antioxidant/anti-inflammatory effects protecting renal tissue. [22]

3.4. Quality of evidence & limitations

Much of the experimental evidence is preclinical (rodent models, in vitro assays). Clinical human trials assessing diuretic or effects are scarce or absent in indexed literature.

Variability in extracts (aqueous vs methanol vs ethyl acetate), dose reporting, and lack of standardization (no consistent marker compound quantified across studies) makes cross-study comparison difficult.

Safety/toxicity studies are limited — for a therapeutic claim (or drug development) systematic toxicology and pharmacokinetics are required.

3.5. Gaps and research needs (for a publishable systematic review or new experiments)

- Clarify the clinical question — are you reviewing diuretic activity (increasing urine) or antidiuretic (decreasing urine)? Current literature supports diuretic uses; if you need diuretic evidence, this is likely absent.
- Systematic review / PRISMA: run a reproducible search (PubMed, Scopus, Web of Science, Google Scholar, local Indian journals) for in vivo, in vitro, and clinical studies; extract methods, doses, outcomes (urine volume, Na+/K+ excretion, biomarkers).
- Meta-analysis feasibility: likely low now because of heterogeneity and few comparable studies, but you can tabulate effect directions and quality.
- Standardization work: phytochemical standardization (quantify a marker like diosgenin/pedalitin) and dose-response animal studies.
- Human studies: small pilot randomized trials would be needed to claim clinical diuretic efficacy and safety.
- Mechanism studies: renal transporter assays, electrolyte balance studies, and detailed renal histology/biomarker assessments.[23]
- Recent anti-lithiatic / nephrology-focused works (2025, 2024) reporting anti-stone and nephroprotective effects — useful to discuss urinary-tract outcomes beyond simple diuresis.
- A structured 1200–2000 word review draft (Introduction, Methods [search strategy], Results — study table, Discussion, Conclusion, References).
- A PRISMA-style methods + search strings (PubMed/Scopus search terms, inclusion/exclusion criteria) so you can reproduce the search.
- A table (spreadsheet) of extracted primary studies (authors, year, extract, model, dose, outcome, quality score

- A short student-friendly summary slide deck (PowerPoint) for presentations.
- A detailed research-protocol for an animal experiment to test diuretic effects (doses, controls, outcomes, ethical points).

Fig 2: *Yanai Nerunjil*

4. AIM OF WORK

Here is a clear and academically suitable Aim of the Work for a review study on Yanai Nerunjil (Pedalium murex)

4.1. Aim of the Work

The aim of this review study is to compile, analyze, and evaluate existing scientific and traditional literature on Pedalium murex (Yanai Nerunjil) with special emphasis on its phytochemical composition, pharmacological properties, therapeutic relevance, and traditional uses, in order to provide a comprehensive understanding of its medicinal potential. [24]

4.2. Aim of the Work (Diuretic Focus):

The aim of this review is to critically evaluate the available literature on Pedalium murex (Yanai Nerunjil) to determine its efficacy, mechanisms of action, and pharmacological significance in diuretic activity, while correlating traditional knowledge with modern scientific findings.The work or aim of using Yanai Nerunjil (Pedalium murex, also known as Large Caltrops or Gokhru) in traditional medicine, particularly Siddha and Ayurveda, is primarily to support the urinary system, reproductive health, and improve overall vitality.

4.3. Key aims of using Yanai Nerunjil include:

Urinary and Kidney Health: It acts as a natural diuretic, promoting healthy urine flow and helping to flush out toxins from the urinary tract. It is widely used to treat urinary tract infections (UTIs), relieve burning sensations during urination, and help prevent or dissolve kidney and bladder stones.

4.4. Reproductive System Support:

The herb is known for its aphrodisiac properties and is used to enhance male and female fertility.

It improves libido, helps with erectile dysfunction and impotency in men, and is believed to increase sperm count and quality. In women, it is used to help manage symptoms of PCOS and balance hormones.

4.5. Physical Strength and Stamina:

It is considered a general tonic (rasayana) that helps boost physical endurance, energy levels, and muscular strength, which is why the name "Yanai" (elephant) is associated with it, symbolizing strength.

4.6. Anti-inflammatory and Pain Relief:

It helps reduce inflammation in the joints, muscles, and urinary tract, offering relief from conditions like arthritis and general body pains.[25]

5. PLANT OF WORK

Yanai Nerunjil, also known as Pedalium Murex or Large Caltrops, is a plant with numerous

medicinal properties. Here's a breakdown of its uses and benefits:

5.1. Medicinal Properties

- Urinary Health: Acts as a diuretic, supporting kidney and bladder function, and helps flush out toxins.
- Reproductive Health: Enhances fertility, libido, and sexual health in both men and women.
- Anti-Inflammatory: Reduces inflammation in urinary tract, joints, and muscles.
- Antioxidant: Rich in flavonoids, alkaloids, and minerals, protecting against oxidative
- stress.[26]

5.2. Traditional Uses

- Treats urinary tract infections (UTIs), kidney stones, and bladder discomfort.
- Addresses impotency, gonorrhea, arthritis, and dysuria. Used for leucoderma, piles, and spleen enlargement.
- Relieves nerve weakness and respiratory problems.

5.3. Parts Used

- Leaves: Anti-ulcer and anti-inflammatory properties.
- Stem: Used for treating gonorrhea.
- Fruit: Demulcent, diuretic, and aphrodisiac properties.
- Roots: Antibilious and used for treating urinary disorders.[27]

6. METHODOLOGY

The methodology for studying Yanai Nerunjil (Pedalium Murex) typically involves a combination of traditional knowledge, pharmacological analysis, and scientific research. Here's an overview:

6.1. Extraction and Preparation

- Plant Material: Collect and authenticate Yanai Nerunjil plant parts (leaves, stem, fruit, roots).
- Extraction: Use solvents (water, ethanol, methanol) to extract bioactive compounds.
- Concentration: Concentrate extracts using rotary evaporation or lyophilization.

6.2. Pharmacological Analysis

- Phytochemical Screening: Identify bioactive compounds (alkaloids, flavonoids, saponins).
- In Vitro Studies: Assess antimicrobial, anti-inflammatory, and antioxidant activities.
- In Vivo Studies: Evaluate efficacy and toxicity in animal models.[28]

6.3. Clinical Trials

- Human Studies: Conduct randomized controlled trials to assess safety and efficacy.
- Dose-Response Studies: Determine optimal dosage and administration.[29]

6.4. Analytical Techniques

- HPLC: Analyze extract composition and quantify bioactive compounds.
- GC-MS: Identify volatile compounds.
- LC-MS:Analyze non-volatile compounds.[30]

6.5. Quality Control

- Standardization: Establish standards for extract quality and potency.
- Stability Studies: Assess extract stability and shelf-life.

This methodology provides a comprehensive approach to studying Yanai Nerunjil's medicinal properties and potential therapeutic applications.[31,32]

7. CONCLUTION

A highly prized medicinal plant with substantial therapeutic potential, Pedalium murex (Yanai Nerunji) is particularly useful in the treatment of renal and urinary diseases. Its use as a diuretic, urinary tonic, and kidney-protective herb has long been acknowledged by traditional medical systems, and current research offers compelling pharmacological evidence in support of these assertions. Its diuretic, nephroprotective, anti-inflammatory, antioxidant, antibacterial, and antiurolithiatic qualities are attributed to the presence of a variety of bioactive substances, including flavonoids, saponins, phenolics, and triterpenoids. Consequently, mechanistic studies, dosage optimization, phytochemical standardization, and clinical validation should be

the main areas of future research. Pedalium murex has a great chance to become a safe, efficient, and scientifically supported herbal remedy for kidney and urinary health with the right kind of scientific confirmation.

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