

Exploring the Nutritional Benefits of Neglected Crops: Unlocking the Potential for a Healthier Future

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Abstract

A crop that was once neglected and undervalued has now emerged as a crucial species, recognized for its ability to flourish in tough conditions owing to its genetic resilience. It offers significant nutritional and industrial benefits that are crucial both for present and future needs. However, the cultivation of such underutilized crops remains limited to remote areas, primarily by impoverished farming communities who lack access to modern farming technologies. In recent times, this crop has started to gain international attention as a valuable source of nutrition and a potential key crop for the future. Despite this growing interest, it has not yet been widely adopted in mainstream agricultural practices, either in India or globally. With the anticipated rise in the global population and the increasing challenges posed by climate change, we firmly believe that this ancient, widely distributed, and nutrient-dense crop has great potential to enhance our food systems and meet the demands of the future.

Key words: Nutritional benefits; underutilized crops: Mudavattukal kilangu: Clove bean: Grain amaranthus

Mudavattukal kilangu

Drynaria quercifolia (L.) J. Smith, belonging to the Polypodiaceae family, is an epiphytic (growing on trees) or epipetric (growing on rocks) medicinal fern. It is widely distributed in the evergreen forests of the Western Ghats of Kerala and is locally known as *Marappan kilangu* or *Attukal kilangu*. This large fern species, commonly called the Oak Leaf Fern, has deeply divided fronds and is native to regions including India, Southeast Asia, Malaysia, Indonesia, the Philippines, New Guinea, and Australia. Mudavattukal kilangu, also referred to as Oak Fern, is a root that has been utilized in traditional Chinese medicine for thousands of years. It is known for its benefits in supporting joint and bone health, promoting healthy

skin, and enhancing the immune system. This root is packed with essential nutrients, including dietary fiber, carbohydrates, vitamins such as vitamin C and B-complex, as well as important minerals like potassium, magnesium, and calcium.

Traditionally, a soup made from the rhizome of *D. quercifolia* is popular among tribal communities in the Eastern Ghats of Tamil Nadu, where it is used to alleviate rheumatic complaints. The rhizome is also employed by tribes in both Tamil Nadu and Kerala for the treatment of a variety of ailments, including phthisis, dyspepsia, cough, typhoid, jaundice, fever, headaches, and skin diseases.

The rhizome of this plant has been reported to possess several medicinal properties, such as antioxidant, analgesic, antifertility, antimicrobial, anthelmintic, antipyretic, anti-inflammatory, antidiabetic, and anti-arthritic effects. Various bioactive compounds found in *D. quercifolia* include 3,4-dihydroxybenzoic acid, friedelin, epifriedelinol, β -amyirin, β -sitosterol, and β -sitosterol 3- β -D-glucopyranoside.

It is a natural remedy with many health benefits,

- ✓ **Joint Health:** Mudavattukal kilangu can assist in relieving joint pain, reducing swelling, alleviating stiffness, and addressing issues such as sprains and arthritis.
- ✓ **Bone Health:** It helps in strengthening and maintaining healthy bones.
- ✓ **Immune System:** It supports and boosts the immune system, enhancing the body's natural defense mechanisms.
- ✓ **Blood Sugar Regulation:** It has low glycemic index, it can aid in regulating blood sugar levels.
- ✓ **Digestive Health:** It promotes better digestion and supports regular bowel movements.
- ✓ **Anti-inflammatory:** The plant contains active compounds like polysaccharides and

flavonoids, which may provide anti-inflammatory effects.

- ✓ **Detoxification:** It helps in cleansing the body of toxins, contributing to overall vitality and well-being.



Figure 1: Habit and Habitat of *D. quercifolia*



Figure 2: Rhizomes of *D. quercifolia*

Clove bean

Clove Beans (*Ipomoea Muricata*) also known by other names like **Wild Sweet Potato** or **Horned Bindweed**, is a plant species in the **Convolvulaceae** family. It is native to tropical regions and can be found in parts of Asia, Africa, and the Americas. The plant is characterized by its striking appearance, with heart-shaped leaves and trumpet-shaped flowers, often in shades of purple or white. This crop can be grown throughout the year; hence it is called 'Nithya Vazhuthana' in Malayalam. It is a vine plant with small bunches of fruits. It is not a bean at all, but is closer related to Morning Glory. Tender fruits are used for

cooking. The fruit are with long pedicels and swollen tips like bulb. It is popular in Kerala and the Konkan coast.

Underutilized vegetables can contribute essential micronutrients to the diet by adding variety to food ingredients. Additionally, these vegetables offer a valuable opportunity for achieving a balanced diet, particularly for impoverished rural communities. Many of these lesser-known vegetables are packed with vitamins, minerals, and antioxidants.

It is enriched with fibre, calcium, Potassium, vitamin -c etc., It contains protein (1.00-1.5g/100g), phosphorous (120-150 mg/100g), Iron (0.13-0.19 mg/100g), Calcium (200-220 mg/100g), Ascorbic acid(30-40 mg/100g)and crude fibre (1.67-3.3%)



Fig 3. Clove bean

Grain Amaranth

Grain amaranth, a minor and underutilized potential crop, has become a life support species, having genetic tolerance to survive under harsh conditions and possessing qualities of nutritional and industrial importance for a variety of purposes for the present as well as future needs of mankind. Amaranthus is a dicotyledonous pseudocereal and one of the New World's oldest crops, having originated in Mesoamerica. The family Amaranthaceae is generally considered as the "amaranth family." The word Amaranthus is basically derived from the Greek word "anthos" (flower) which means everlasting or unwilting.



Fig 4. Grain amaranth

Grain amaranth, an edible pseudocereal is now a crop of interest because of its higher and quality protein and high micronutrient content. This crop can be grown even in the hospitable environment. The three principal species that are considered for grain production include: *Amaranth hypochondriacus*, *A. cruentus* and *A. caudatus*. In some of the Indian languages, it is known as rajgira (king of seeds) in Gujarati, ramdana (seed sent by God) in Bihar, Odisha and Uttar Pradesh, chuka in Bengal, kalaghesa, chumera and ganhar in Central India and bathu in Himachal Pradesh etc. The health benefits of grain amaranthus were, Amaranth is a complete protein, meaning it provides all the essential amino acids required for building and repairing cells and tissues. It's an excellent protein source for those who avoid animal products. The protein content of the seed ranges from 15-56 mg/100g of seed. The protein in amaranth seeds being of high quality, AMA-1 gene has been isolated from this crop and is being introduced into other important food crops like rice and potato. In potato, the product with higher yield and protein content has been found to be safe. The product has cleared tests related to toxicity and other side effects. The leaves are also rich in protein and are extremely useful from the human nutrition. Amaranth is rich in insoluble fiber, which supports digestion and can help alleviate constipation. It contains more fiber than other gluten-free grains like buckwheat and millet. The dietary fiber content in seed was 6.76 mg/100g. Amaranth is a nutrient-dense grain that offers a range of health benefits. It is rich in polyphenols, which act as antioxidants to help detoxify the body by eliminating harmful substances. The unsaturated fatty acids and high fiber content in amaranth may contribute to lowering cholesterol levels, while its potential to reduce inflammation could offer

additional health benefits. Additionally, amaranth may help lower elevated blood pressure and promote stronger bones, making it a valuable addition to a balanced diet. Furthermore, its high fiber content may assist in weight management, supporting overall well-being. It is enriched with protein (15-59 mg/100g), phosphorous (557 mg/100g), Iron (7.61 mg/100g), Calcium (159 mg/100g), manganese (3.33mg/100g), Magnesium (248 mg/100g) Ascorbic acid (4.20 mg/100g), vitamin -B (0.56 mg/100g) and crude fibre (6-7g/100g), carbohydrates (65g/100g), sugars(1.7 g) and energy (1554 KJ).

Conclusion

In conclusion, underutilized crops represent a valuable yet often overlooked resource that can play a significant role in addressing global nutritional challenges. These crops, many of which are resilient to harsh environmental conditions, offer a wealth of essential vitamins, minerals, and other nutrients that can enhance food security, especially in regions facing climate change and resource constraints. By reintroducing and promoting these crops, we not only preserve agricultural biodiversity but also diversify our diets, making them more sustainable and nutritionally rich. Investing in the research, cultivation, and global awareness of underutilized crops could be a crucial step towards a healthier, more resilient future for humanity.

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