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Momordica cymbalaria (Athalakkai) - A unraveled treasure

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Introduction:

Momordica cymbalaria, also known as **little wild gourd**, is a member of the Cucurbitaceae family. It is alternatively referred to as *Momordica tuberosa Roxb.Cogn.* or *Luffa tuberose Roxb*. The commonly used names for this entity include "Athalakkai" in Tamil Nadu, "Karchikai" in Karnataka, "Kasarakai" in Telugu, and "Kadavanchi" in Marathi. The plant under consideration is a perennial climbing species that exhibits growth exclusively during the Kharif and Rabi seasons. It is primarily distributed in the southern Indian states of Andhra Pradesh, Karnataka, Madhya Pradesh, Maharashtra, and Tamil Nadu. The farmer does not cultivate the crop as a conventional crop, despite its successful growth during the kharif and rabi seasons, particularly in regions with black soil that are suitable for cotton, sorghum, Bengal gram, and onion cultivation. Historically, the plant in question was initially classified as a weed; however, its tubers have been utilized for medicinal purposes since ancient times. In recent times, fruits have been used as vegetables due to their nutritional composition.

The plant is documented as a medicinal plant in India, with different parts of the plant being utilized for the treatment of common ailments. The plant has been traditionally utilized for the management of diabetes mellitus and also recognized for its antiovulatory properties. This crop has the potential to serve as a means to combat malnutrition and alleviate hunger. In addition to the fruit, it is noteworthy that leaves can also serve as a viable leafy vegetable. The vegetable crop in question is considered unraveled due to its lack of commercial cultivation, resulting in limited awareness regarding its nutritional aspects, folk medicine, and functional food ingredient.

Botany and Taxonomy

Kingdom	Plantae
Class	Dicotyledonous
Botanical name	**Genus**: *Momordica* **Species** *Cymbalaria*
Order	Cucurbitales
Family	Cucurbitaceae
Chromosome number	2n = 18
Origin	Tropical regions of India and southeast Asia.

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Floral biology

- The plant is a perennial climber & scandent, branched, striate stem
- It is cross pollinated crop, unisexual in nature
- Dicotyledonous plant
- Flower are white to yellow in color
- The male flower peduncle is 5 – 30 mm long filiform, puberulaus, ebracteate with 2-3 flower in racemes with a pale-yellow corolla and two stamens for each flower
- The female flower is solitary on a peduncle of 28 mm length
- Fruits are economic part of this crop and it is green in color and used as vegetable.
- Hypoglycemic, Hypolipidemic,Cardio Protective, Nephroprotective and Antidiarrheal Properties,
- The presence of saponins the responsible for hepatoprotective, Anticancer Properties, Antimicrobial Activity Disorders Like Rheumatism, Liver Disease, Reduced Serum Glucose Level In both normal and type II diabetic rate

Medicinal uses

It is a crop which all parts of plant like leaves, fruits & tuber are useful for treatment of various diseases.

Fruit:

Leaves: leaf tea is used for malaria, wounds, worms, parasites, fever; reduce blood sugar level and also useful in treating the diabetic patients.

Tuber: Cure wounds, diarrhea, stomach ache, mouth ulcers and stomach bloting


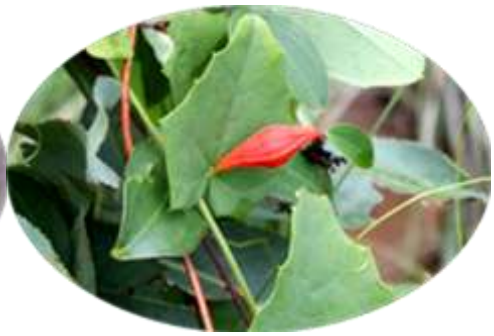

Table 1. Nutritional value of Little wild gourd per 100 g of edible portion (fresh weight basis)			
Moisture %	84.30	**Phosphorus**	0.46mg
Protein %	2.15	**Fibers%**	6.42
Fat %	1.61	**Vitamin C mg/100g**	299.12
Carbohydrate %	12.60	**Copper mg/100g**	2.15
Energy K cal /100g	3.00	**Manganese mg/100g**	0.32
Sodium mg/100g	41.58mg	**Irone mg/100g**	1.71
Potassium mg/100g	505.92mg	**Zinc mg/ 100g**	2.82mg
Calcium	73.57mg	**beta -Carotene**	224.9Ig/100g

Propagation

The method of propagation of this species primarily occurs through asexual means, specifically through the propagation of tuberous roots. The tubers initiate growth subsequent to the commencement of the monsoon season and enter a state of dormancy during periods of dryness in the summer.

Seeds typically possess a black hue, exhibit a glossy appearance, and possess a firm texture. Consequently, seeds are generally not employed for the purpose of propagation due to their low or negligible germination rate. Tissue culture techniques have proven to be valuable in facilitating large-scale propagation through the utilization of various explants.

Soil

These vines exhibit prolific growth in black cotton soils. It is frequently found in proximity to river banks and fallow lands.

Season

The onset of rainfall in the months of July and August initiates the growth of Athalakkai vines, which emerge from the preexisting tubers present in the soil. The conclusion of the harvest occurs during the months of December and January.

Spacing

Tubers should be planted with a spacing of 5 x 5 feet.

Seed rate

25 kg of tubers are required to sow an acre of land

Harvest

An average yield of 5 metric tonnes can be obtained from one hectare of area. Upon the receipt of rainfall following the sowing process, the tubers promptly initiate the growth of their vines, resulting in the emergence and development of shoots. The flowering of pale-yellow flowers occurs 25 days subsequent to the growth of the vine. Fruit availability is expected within the forthcoming ten-day period. Harvest the fruit by grasping the vine. It is advisable to exercise caution when removing the vines in order to prevent any potential damage. The produce ought to be transported to the market within a maximum of five hours subsequent to its harvesting.

Plant Protection:

Pest

The presence of the Hadda beetle and Cotton aphid has been observed on the veins of plants, where they engage in sap-sucking activities. Additionally, the Fruit fly has also been identified in this crop.

Disease

The Black gram yellow mosaic virus is a typical disease that affects plants.

Future approach

Despite its high medicinal value and nutritionally rich, it is not being cultivated commercially. Because of lack of viable seeds and availability of vegetative propagating material (tubers). Studies are lacking with respect to seed dormancy and viability test. Different seed germination and seed viability tests have to be conducted for recommending the crop for commercial cultivation. It is already proved by different scientists that it can be used for curing so many diseases, so to exploit the potentiality of this crop and hence it has to be grown on large scale. Since the seeds are non-viable/ less germination frequency it's difficult to grow on large scale. So now it is essential to study this crop and identify breeding methods suitable for the improvement of this crop. To exploit its potentiality special breeding methods can also

be used such as protoplast fusion, embryo rescue and embryo culture to overcome post fertilization barriers. The germplasm of different locations has to be characterized by using different markers to assess variability and also for desirable traits for further crop improvement programme.

Conclusions:

Momordica cymbalaria is found in tropical India as an underutilized cucurbitaceous vegetable crop. It is not commercialized because of lack of viable seeds or tubers availability in market. Since seeds are poor in germination it has to be grown by tubers. As it also considered as a medicinal crop because of its medicinal properties, this crop can be genetically manipulated to exploit its potentiality.

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