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Aerial Yam: The Forgotten Treasure of Indian Farms

*Imamsaheb S. J., Shreedhar D and Gopali J. B.
AICRP (Tuber Crops), Dharwad, Regional Horticultural Research and Extension Center, Dharwad, University of Horticultural Sciences, Bagalkot, Karnataka, India
*Corresponding Author's email: imamjath@gmail.com

Aerial yam (*Dioscorea bulbifera*), commonly known as air potato, is a unique member of the yam family that distinguishes itself by producing edible bulbils above the ground, rather than tubers beneath the soil like other yams. Native to tropical regions of Asia and Africa, this fast-growing, twining vine has been traditionally cultivated and consumed by various indigenous communities for centuries. Aerial yam fascinating in its adaptability, nutritional richness, and potential for food security in resource-limited areas. The bulbils which resemble small potatoes grow in the leaf axils of the vine and can be harvested, cooked, and consumed in various forms. In addition to its value as a food source, certain varieties of aerial yam are recognized for their medicinal uses, especially in traditional healing systems. Despite being overlooked in modern agriculture. Aerial yam is now gaining renewed attention from researchers and farmers due to its resilience, minimal input requirements, and promise as a climate-resilient crop. As we search for sustainable solutions to global hunger and nutrition, this forgotten tuber may well become a food of the future growing not beneath our feet, but above our heads.

Nutraceutical Values of Aerial Yam

Aerial yam is not just a traditional food crop it is increasingly recognized for its nutraceutical potential, meaning it offers both nutritional and medicinal benefits. Various phytochemicals and bioactive compounds present in aerial yam contribute to health promotion and disease prevention.

Rich Source of Energy

- High in **complex carbohydrates** (~20–25%), making it an excellent source of sustained energy.
- Low in fat and cholesterol, suitable for balanced and healthy diets.

Phytochemicals with Medicinal Properties

- Aerial yam contains several bioactive compounds, including: Diosgenin: A steroidal saponin used as a precursor in the synthesis of hormones like progesterone, cortisone, and other corticosteroids.
- Exhibits anti-inflammatory, anti-tumor, and hypoglycemic effects.
- Alkaloids and tannins: Contribute to antimicrobial, antioxidant, and anti-diabetic activity.
- Phenolic compounds and flavonoids: Provide antioxidant protection, reducing oxidative stress in the body.

Medicinal and Health Benefits

- **Anti-diabetic**: Regulates blood sugar levels due to diosgenin and fiber content.
- **Antioxidant**: Reduces free radical damage, supports aging and cellular health.
- **Anti-inflammatory**: Traditional use in treating joint pain, arthritis, and skin conditions.
- **Cardio protective**: Helps in managing blood cholesterol levels.
- **Digestive Health**: Rich in dietary fiber, aiding digestion and gut health.

Nutritional Composition (approximate per 100g fresh weight)

Nutrient	Amount
Energy	90–110 kcal
Carbohydrates	20–25 g
Protein	1.5–2.5 g
Fat	0.2–0.5 g
Fiber	2.0–4.0 g
Vitamin C	10–20 mg
Calcium	20–30 mg
Iron	0.5–1.5 mg
Potassium	200–400 mg

Varieties and Landraces of Aerial Yam

Sl. No.	Variety / Local Name	Type	Region / Origin	Key Characteristics
1	Konkan Kalika	Cultivated / Improved	DBSKKV, Dapoli	High yield, early maturity, good shelf-life of bulbils Medium to large (200–400 grams per bulbil) High starch (20–25%), suitable for consumption
2	Baichandi	Landrace	Odisha	Edible, mildly sweet, consumed in tribal cuisine
3	Pithalya Kand	Landrace	Maharashtra	Traditionally used, slight bitterness, some medicinal use
4	Adanakkizhangu	Landrace	Tamil Nadu	Cultivated in home gardens, used in local dishes
5	Anumula Gadda	Landrace	Andhra Pradesh / Telangana	Popular in rural areas, medium-sized bulbils

Soil

Aerial yam thrives best in well-drained, fertile loamy to sandy loam soils with a slightly acidic **to** neutral pH range of 5.5 to 7.0. Proper soil drainage is crucial, as the crop is sensitive to water logging, which can cause rotting of the bulbils and roots. The soil should be loose and well-aerated to support good root and vine development. Aerial yam benefits from the incorporation of organic matter**,** such as farmyard manure (10–15 tonnes per hectare) during land preparation, which enhances soil fertility and moisture retention. Deep soils with a fine tilth are preferred, allowing the plant to establish strong vines and produce larger bulbils.

Climate

Climatically, aerial yam prefers a warm and humid tropical environment, with an ideal temperature range of 25°C to 35°C. The crop performs well under moderate to high humidity (60–80%) and requires well-distributed annual rainfall between 800–1200 mm. While aerial yam can tolerate partial shade, it grows best in areas receiving ample sunlight, which promotes vigorous vine growth and bulbil development. It is adaptable to elevations ranging from sea level up to about 1000 meters above mean sea level. In rainfed regions, planting is typically done with the onset of the monsoon (June–July), whereas under irrigated conditions, it can be planted during the post-monsoon season (October)**.** The crop is moderately tolerant to short dry spells once established but is sensitive to frost and prolonged cold temperatures, which can adversely affect growth.

Cultural Practices for Aerial Yam Cultivation

Aerial yam is grown on well-drained, fertile soils using healthy bulbils (100–150 g) as planting material. Land is prepared with 2–3 ploughings and incorporation of FYM (10–15 t/ha). Planting is done at the onset of monsoon (June–July) or October in irrigated areas, at a spacing of 90 × 90 cm. Being a climbing vine, it requires support structures like bamboo poles or trellises. Timely weeding, earthing up (at 45–60 days), and Apply basal dose of NPK fertilizer, 100:50:100 kg N:P_2O_5:K_2O per hectare, split nitrogen application: half at planting and remaining after 30–45 days. The crop matures in 180–200 days, and bulbils are harvested once they mature and vines begin to dry.

Value Addition

Aerial yam offers significant potential for value addition due to its unique nutritional and medicinal properties. The bulbils, rich in starch, dietary fiber, and antioxidants, can be processed into various nutritious food products such as yam chips, flour, flakes, baby food, porridge mixes, and ready-to-cook cubes. Its flour is a gluten-free alternative for baking and is suitable for diabetic and health-conscious consumers. Traditional methods include boiling, roasting, or frying, while modern processing involves dehydration, vacuum frying, and instant product formulation.

Aerial yam-based value-added products

Product	Description
Aerial Yam Flour	Finely milled flour from dehydrated bulbils; used in baking, porridges, and mixes
Ready-to-Cook Yam Chips	Dehydrated or vacuum-fried chips with seasoning
Aerial Yam Pickle	Traditional fermented or spiced pickle made from cooked bulbils
Aerial Yam Soup Mix	Powdered mix with spices and additives for instant soup
Gluten-Free Biscuit/Cookie Mix	Made using aerial yam flour; suitable for health-conscious and diabetic consumers
Dried Yam Cubes	Blanched and sun- or oven-dried pieces used in curries or soups
Fermented Yam Beverage	Traditional health drinks or probiotic-rich beverages (tribal uses)
Starch Extract (Food Grade)	Processed starch used in food processing or as a thickener