

International Journal of Pharmacognosy and Clinical Research



ISSN Print: 2664-763X
ISSN Online: 2664-7648
Impact Factor: RJIF 8.00
IJPCR 2023; 5(1): 22-27
www.pharmacognosyjournal.in
Received: 14-11-2022
Accepted: 19-12-2022

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Overview of plant giant taro

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DOI: <https://doi.org/10.33545/2664763X.2023.v5.i1a.27>

Abstract

Alocasia macrorrhiza is a type of flowering alum native to the rainforests of Malaysia, Bangladesh and India. This plant contains D-glucose (44.95-78.85%), D-galactose (8.70-25.35%), D-mannose (3.20-10.45%), D-arabinose (2nd, 45-5.20%), flavonoids, cino Includes genetics. glycosides, ascorbic acid, vitamins, phytochemicals, minerals, carbohydrates and small amounts of rhamnose. Plants have been found to be effective as anti-cancer agents and to prevent scurvy. Treatment of insomnia, antioxidant action. The plant also has antifungal properties. The leaves and steam are also edible after cooking, but the giant taro contains a large amount of itchy rhizomes and is rarely eaten. It is also used in the treatment of severe burns and acute abdominal pain. It is an important medicinal plant in tropical and subtropical regions of Asia and South America. *Alocasia* is recommended in Ayurvedic texts for the prevention and treatment of inflammation, abdominal and splenic disorders, antibacterial, anticancer, analgesic, hepatoprotective, hepatorenal, antioxidant and antifungal agents. The leaf juice is used as a digestive, anthelmintic, laxative, diuretic and astringent. *Alocasia macrorrhiza* is a perennial ornamental plant. Its common English name is Giant Elephant's Taro. This plant contains monoindole alkaloids, neuriganamides, flavonoids, oxalic acid, cyanogenic glycosides, alokacin, cholesterol, amino acids, gallic acid, malic acid, ascorbic acid, succinic acid, glucose, fructose, sucrose, and beta-lectin. It is this article aims to review the biological activities, pharmacological uses, and clinical studies of *alocasia* to provide directions for further research.

Keywords: *Alocasia macrorrhiza*, anti- inflammatory, anticancer, hepatoprotective, monoindole alkaloid

Introduction

Alocasia macrorrhiza Also known as giant *alocasia*, metallic tallow (another English name) and *kunjevoi*.^[1] The WHO estimates that 80% of the drug-unaffordable population in developing countries relies primarily on traditional plant-based medicines. According to WHO, the plant has been used since ancient times to treat various ailments. Herbal medicines are popular due to their efficacy, availability, low cost, and relatively low toxic effects. *Alocasia macrorrhiza* is an aroidal flowering plant native to the rainforests of Malaysia and Queensland, and has long been cultivated on many selected islands and elsewhere in the tropics. About 8 species of plants are found in India^[2]. Taro is a vegetatively propagated tropical root that originated in Southeast Asia. Its cultivation is widespread throughout Africa, and therefore ranks ninth among the world's food crops. Taro is an important carbohydrate source as an energy source, and is used as a staple food in tropical and subtropical countries. It is produced mainly from underground tubers containing 70-80% starch. Many root crops and tubers are grown in the world^[3]. The date of its spread to the region is unknown, but the plant was primarily produced in Africa and is now grown in Cameroon, Nigeria, Ghana and Burkina Faso, where it has become of great importance. It has been suggested that it was grown to fill seasonal food shortages when crops were still in the fields. This is because it may provide reasonable yields in conditions where other crops may not be able to provide the product due to various production constraints^[4]. Taro tubers, like many other tuber fruits, are relatively low in protein (1.5%) and fat (0.2%). 1.2%). Taro is a good source of thiamine, riboflavin, iron, phosphorus and zinc, and is also a good source of vitamin B6. Taro corm (Or taro) is a rich source of health-enhancing compounds, but this crop is largely neglected worldwide as it is primarily associated with subsistence farming, as is the consumption of the nodule. Moreover, due to poverty, unsustainable agricultural practices, and climate change, the taro plant faces many challenges in some developing countries such as sub-Saharan Africa and other Latin American countries^[5].

Plants as Sources of Medicine: Plants form the backbone of traditional medicines around the world. Pharmacological research recognizes the value of medicinal plants as potential sources of bioactive compounds. Phytochemicals derived from medicinal plants serve as lead substances in pharmaceutical research and development [6]. Phytochemicals and antioxidants in plant materials are of interest to scientists, food manufacturers, producers and consumers for their role in maintaining human health. Cocoyam is rich in carbohydrates, minerals, vitamins and other phytochemicals. Widely used for cultivation. This plant contains D-glucose (44.95-78.85%), D-galactose (8.70-25.35%), D-mannose (3.20-10.45%), D-arabinose (2nd, 45-5.20%), flavonoids, Cino Genetics, Glycosides, Ascorbic Acid, Vitamins, Phytochemicals, Minerals, Carbohydrates, minor Rhamnose. However, its composition varies depending on the variety and country of origin. [7]. It has a large elongated trunk about 3 feet long and arrow-shaped leaves with flattened, rounded lobes [8]. *Alocasia* includes more than 113 species of rainforest undergrowth plants found in regions of Southeast Asia, Malaysia and Australia. Several species, including giant taro, *Alocasia macrorrhizos*, Chinese taro, and *Alocasia cucurata*, are important edible or ornamental plants. We examined the biogeography of this genus using plastid and nuclear DNA sequences (5200 nucleotides) from 78 accessions representing 25 species in addition to 71 species representing 16 genera of the Pistia clade to which *Alocasia* belongs [9].

Scientific Classification

Kingdom	Plantae
Subkingdom	Tracheobionta
Superdivision	Supermatophyta
Division	Magnoliophyta
Class	Liliopsida
Subclass	Arecidae
Order	Arales
Family	Araceae
Genus	Species
Species	<i>Alocassia macrorrhiza</i>
Synonymes	<i>Alocassia dussil dammer</i>

Taxonomy and Morphology

Alocasia, also known as taro, belongs to the Araceae family. Linnaeus originally described his two species of cultivated plants, now known as *C. esculenta* and his *Colocasia antiquorum*. Taro is a plant commonly grown as an ornamental, he is a close relative of *Xanthosoma* and *Caladium*, and like them, is sometimes loosely called elephant's ear. Taro consists of at least 100 genera and over 1500 species. Analysis of variance revealed significant differences between strains for all quantitative morphological traits tested, suggesting that there was a high degree of phenotypic diversity among strains. Plant height, leaf length, leaf width, petiole length, pod length, and root length: width ratio showed large variations, while petiole width, pod width, and bud length: width ratio showed a narrower range of phenotypic variation. Identification of morphological features (quantitative and qualitative) was performed by directly observing vegetative structures such as roots, tubers, stems and leaves of giant taro plants. Observed morphological characteristics included plant height, leaf length, leaf width, petiole length, petiole width,

pod length, pod width, tuber length-to-width ratio, root length and width ratio, was the abaxial secondary vein. [10]. A highly adaptable wild plant, the rhizome of *Alocasia* is a traditional Chinese herbal medicine. The current study investigated the antiproliferative components of giant taro and isolated six new (1-6) and four known piperidine alkaloids (7-10) from their rhizomes. Their chemical structures and absolute configurations were elucidated using various spectroscopic methods and the Mosher ester method [11].

Properties, part used, dosage

Ayurvedic properties of mankind

Rasa [taste]-Madhura [sweet]

Guna [qualities] - Guru [heavy for digestion], snigdha [slimy in nature]

Vipka- Madhura [undergoes sweet taste after digestion]

Veerya [potency] sheeta [Cold]

Karma [Actions] vatapitta shamaka [reduces vitiated vata and pitta.

Part used- rhizome, stem leaf

Dosage

Root powder – 5-10 gm

Juice – 10 – 20 ml

Stalk and leaf juice – 12 – 24ml

Leaves powder – 5 - 10 gm

Health benefits of large taro

It has a wide range of traditional benefits associated with various biological properties such as cytotoxicity, antihyperglycemia, antibacterial and anti-inflammatory. *Alocasia* species exhibit a wide variety of biological activities that are of great medical value. The genus *Alocasia* is reportedly capable of producing a potent, high-quality anticancer compound, namely *Alocusgenoside B*, but information on this compound is currently limited. Poatoes have various health benefits. Rich in neuliganamidmonoindole alkaloids. Vitamin C, carbohydrates, zinc, vitamin E, magnesium, and iron essential for maintaining good health.

1. Anticancer effect

Cancer is one of the leading causes of death worldwide and is primarily associated with an unhealthy diet and lifestyle. Finding ways to reduce and prevent cancer risk from dietary components found in plant-based foods is important. Cancer is a multi-stage medical condition, and tapping at each early stage may alleviate the condition. Phytochemicals from roots and tubers have shown anticancer effects in several cancer cell lines and animal models.

2. Prevention of scurvy

Scurvy is a health condition caused by a deficiency of vitamin C in the body. Symptoms are caused by weakening of collagen-containing bones, blood vessels, and connective tissue. Vitamin C is an antioxidant essential for the production of collagen.

3. Anti-inflammatory

Five new ligandamides and a new monoindole alkaloid have been identified along with the isolated and identified rhizome of *Alocasia macrolitha* the major bioactivities of

Alocasia species discussed include anti-inflammatory activity.

4. Brain Health

Iron supports oxygen supply in the blood. About 20% of oxygen is used by the brain, so iron is related to brain function and health. Adequate blood flow to the brain improves cognition and creates neural pathways that help prevent cognitive disorders such as Alzheimer's disease and dementia.

5. Treatment of insomnia

Magnesium helps you sleep better. People with low nutrient consumption and intake are at increased risk of insomnia. This study shows that people supplementing with magnesium during sleep have higher levels of stress-related melatonin and lower levels of cortisol.

6. Antidiarrheal activity

The *in vitro* antidiarrheal activity of aqueous and ethanolic extracts of *Alocasia indica* was evaluated against *Escherichia coli*, *Salmonella typhimurium*, *Shigella*, and *Staphylococcus aureus* by the agar diffusion method. The antidiarrheal activity of the extract *in vivo* was investigated against resinoleic acid- and magnesium sulfate-induced diarrhea.

7. Anti-tumor activity

The anti-tumor activity of *Alocasia macrorrhiza* aqueous extract was evaluated using human cancer grafts in mouse transplanted tumors and nude mouse models.

8. Prevents convulsions

Magnesium helps treat back pain by relieving kidney stress, black muscle, and muscle soreness. It helps with calcium absorption and accelerates bone healing. A lack of magnesium can lead to symptoms such as fatigue.

9. Formation of hemoglobin

Iron is essential in the formation of hemoglobin, which gives blood its dark red hue. It carries oxygen to body cells. Extra hemoglobin is very important because people lose blood through both trauma and internal injuries. Women are more likely than men to develop anemia because they bleed monthly during menstruation ^[12].

Other scientific names of *Alocasia macrorrhiza*

Alocasia cordifolia (Bory) Cordem.
Alocasia indica (Lour.) Spach
Alocasia macrorrhizos var. *rubra* (Hassk.) Furtado
Alocasia macrorrhizos var. *variegata* (K.Koch & C.D. Bouché) Furtado
Alocasia marginata N.E.Br.
Alocasia metallica Schott
Alocasia montana (Roxb.) Schott
Alocasia pallida K. Koch & C.D. Bouché
Alocasia plumbea Van Houtte
Alocasia rapiformis (Roxb.) Schott
Alocasia uhinkii Engl. & K.Krause
Alocasia variegata K. Koch & C.D. Bouché
Arum cordifolium Bory
Arum indicum Lour.
Arum macrorrhizon L.
Arum montanum Roxb.

Arum mucronatum Lam.

Arum peregrinum L.

Arum rapiforme Roxb.

Caladium macrorrhizon (L.) R.Br.

Caladium metallicum Engl.

Caladium odoratum Lodd.

Calla badian Blanco

Calla maxima Blanco

Colo casiaboryi Kunth

Colocasia macrorrhizos (L.) Schott ^[13].

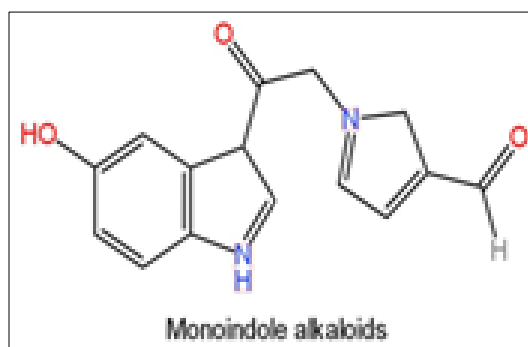
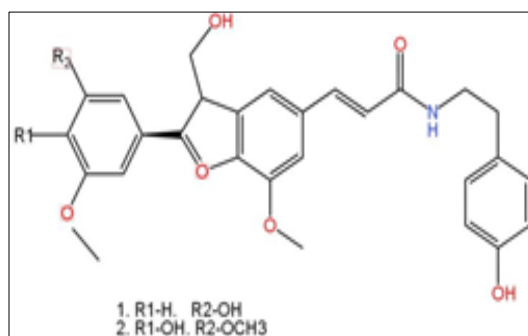
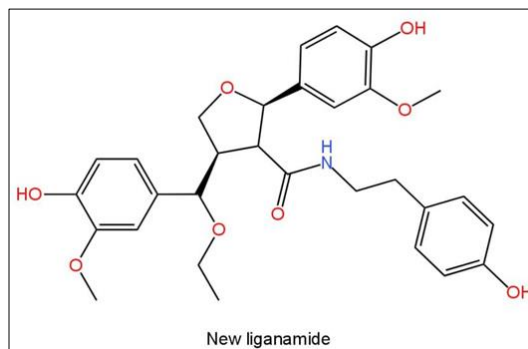


Fig 1: Giant Taro

Giant taro (*Alocasia macrorrhiza*)

Common name

GIANT TARO.

Botanical name

Alocasia macrorrhiza (L.) G.Don.

Family

Araceae.

Other names

Alavu, Alooku, Alu (Ind.); Ape (Polyn.); Babai' (Kiri.); Bigã; (Philipp.); Birah (Mal.); Boro (Assam); Brak (Mal.); Dokuimo (Japan); Hog tannia (Guy.); Inhame gigante (Braz.); Kape (Pacif. Is.); Manaka, Mankachu, Mankanda (Ind.); Oht (Pon.); Pindu (N. Cal.); Puluka (Tuv.); Sãntã© (Indon.); Talanu (Sam.); Toyoeu (Braz.); Uvea (Polyn); Vaaga, Via (gaga), Viamiloa (Fiji).

Chemical constituent: New ligandamide, Mono indole alkaloid, Carbohydrate, Protein, Potassium, Magnesium, Calcium, Sodium, Zinc, Iron, Vitamin B1, B2,C, and also vitamine E.



Fig 2: giant taro

Botany

Giant taro is a large, fleshy, herbaceous plant that can reach 4.5 m in height, with a thick cylindrical stem emerging from a base bulb. The leaves are supported by long petioles that emerge from the stem and wrap around each other in the lower half, but the leaves are more or less heart-shaped and the basal leaves are rather rounded. The leaves are directed upward and form a straight line with the petiole (unlike *Colocasia* and *Xanthosoma* spp., the leaves turn downward and form an acute or right angle with the petiole). The leaf blade is about 1 m long with a prominent midrib raised at the top. They are usually green, but there are mottled or white mottled variegated forms. The Buddha spathe has bluish-yellow-green leaf blades. Tubers are formed around the base tuber plants contain latex.

Origin and Distribution

The giant taro is thought to have originated in Sri Lanka, but has become widely distributed in the South-East Asia subcontinent, Malaysia, Indonesia and Polynesia, and has spread to parts of tropical America.

Cultivation conditions**Temperature**

The species is primarily tropical and growth is adversely affected by temperatures below 10 °C.

Rainfall

Taro requires fairly high and uniform rainfall (more than 170 cm per year) and does not tolerate prolonged drought. Common on riverbanks, but does not tolerate flooding.

Soil

The plant grows well in medium to heavy soils provided drainage is adequate. Response to nitrogen fertilizing has been demonstrated.

Light

Partial shade is ideal and giant taro can tolerate almost full shade.

Moisture

Alocasia macrorrhiza thrives in well-drained soil rich in organic humus. *Alocasia* thrives in moist environments and tolerates shallow flooding. *Alocasia macrorrhiza* is not at all salt tolerant ^[15].

Fertilizing with *Alocasia macrorrhiza* is essential if the plant is grown in a pot. Since it is a succulent plant, it needs to be fertilized regularly. You don't want to deplete the essential nutrients your plants need.

The critical months for fertilization are spring and summer. Apply diluted houseplant fertilizer every two weeks. You can also use a slow-release fertilizer for sweet potatoes. Both Promote Healthy Growth for Your Plants ^[16].

Planting procedure**Material**

Suckers are commonly used, but shoot tips with a few inches of stem and rolled up young leaves, or sections of stem having two or three buds are also frequently employed.

Method

Planting is in holes 15-25 cm deep for suckers or 8-15 cm deep for cormels.

Field spacing

Alocasia is commonly an intercrop with yams, and the spacing is usually 3.5 x 3.5 m. In pure stand 60 x 60 cm to 1.5 x 1.5 m is used.

Pests and diseases

The giant taro is resistant to most pests and diseases, although in India considerable losses have been reported due to an unidentified bacterial leaf spot disease.

Growth period

The crop life is usually 12-18 months, but harvesting can be delayed for up to four years.

Harvesting and handling

The giant taro is normally dug by hand; the plant can remain in the ground for about 3 months after reaching maturity without any deterioration and is in fact often 'field-stored'.

Primary product**Stems**

Unlike most other edible aroids where the edible part is underground, the giant taro fleshy aerial stems provide the main product. These stems can grow up to 1 m long and 20 cm in diameter. usually weighing 8 to 10 kg, but 20 kg or more is not uncommon.

Yield

In the Pacific Islands, although harvesting usually takes place after 18-24 months, the plant grows in up to 4 years and produces tubers weighing about 18 kg. Theoretically, pure stand yields at this stage could be close to 200 tonnes/ha, but yields have not been reported for the Pacific region, as all conventional plantings are cover crops. Hmm. Much lower yields have been reported from Sri Lanka, with harvest usually occurring after 11 months, yielding about 7-11 t/ha per crop (1.8-2.7 kg per plant).

Secondary products and waste

Tuber and leaf juice (latex) are reportedly used for medicinal purposes in India and the Pacific Islands. This plant was previously grown in Brazil and used as fodder for pigs. It is also being studied as a raw material for alcohol production.

Special features

The medicinal properties of the edible portion of the raw stem tuber of giant taro are reported as follows. Water 63-81%; Crude Protein 0.6-3.3%. Calcium 46-153 mg/100 g; Iron 0.5-1 mg/100 g; Phosphorus 45-72 mg/100 g; Niacin 0.4 mg/100 g; riboflavin 0.02-0.03 mg/100 g; thiamine 0.09-0.1 mg/100 g; traces of ascorbic acid. Most of the calcium is contained in calcium oxalate crystals. The composition changes with age, with older materials having lower moisture content and higher solids content. Few numbers are published to indicate starch content, but it may contain significant amounts of other carbohydrates. Starch granules are small, irregularly shaped 4- or 5-sided polygons, 1 to 5 microns long, and contain about 21 percent amylose and 79 percent amylopectin. Several cultivars of *A. macrorrhiza* have been reported to be cyanogenic. Cyanogenic glycosides are absent in tubers and stems, but young leaves have been found to contain up to 0.018% hydrogen cyanide [17].

Table 1: [Names and Languages]

Sr. No	Names	Languages
1	Taro	English
2	Aravi	Hindi
3	Alupam	Sanskrit
4	Alavi	Gujarati
5	Alu	Marathi
6	Sempu	Tamil

Table 2: [Principle]

Principle/ vitamins	Nutrient value per 100 gm	Percentage of rda
Energy	112 Kcal	6%
Carbohydrates	26.46gm	20%
Protein	1.50gm	3%
Total fat	0.20gm	<1%
Cholesterol	0 mg	0%
Dietary fiber	4.1gm	11%
Folate	22mg	5.5%

[18]

Traditional uses

A strong link between humans and plants has existed since ancient times, as the use of plants to treat many ailments has always been a central part of human life. This relationship continues today, with 80% of the population in developing

countries using traditional herbal medicines instead of pharmaceuticals due to their efficacy, availability, affordability and low toxic effects increase. [19]. Although some native taro varieties have high levels of calcium oxalate crystals that are irritating to the mouth and throat, farmers rely on indigenous knowledge to distinguish between the different qualities of such varieties [20]. Taro was used by Hawaiians to treat ailments ranging from constipation to tuberculosis. It is used as a laxative for hemorrhoids. The patient took orally a mixture of raw juice and sugar, and the fever subsided. The leaves of this plant are rich in vitamins A, B and C and have been used to treat asthma. Satoimo is safe for people with milk and grain allergies, as well as children who are sensitive to milk. It acts as a probiotic because it contains predominant lactic acid bacteria. Studies have reported a potential beneficial role in the treatment of diarrhea, gastroenteritis, irritable bowel syndrome, inflammatory bowel disease, cancer, weakened immune function, and lactase dyspepsia. In the Philippines, women with dystocia ate boiled taro leaves and potatoes. Some tribes used taro as an antidote against the stings of wasps and other biting insects, and applied the heated bulbs to painful areas of rheumatism. Also used as a remedy [21]. Morphological and genetic similarities, similar environmental tolerances, and early historical records indicate that taro cultivars have spread far from the low-latitude highlands (subtropical Himalayas) to the high-latitude lowlands of temperate East Asia, including Japan. It may have been cultivated in ancient times. India [22].

Growth cycle of plant giant taro

Growth Cycle Taro is herbaceous, but survives each year through bulbs and tubers. Root formation and rapid root growth occur immediately after planting, followed by rapid shoot growth. Shoot growth and total shoot dry weight decrease sharply about 6 months after planting. At this point, the number of active leaves decreases, the average petiole length decreases, the total leaf area per plant decreases, and the average plant height in the field decreases. There is a rapid change of leaves throughout the season. New ones continually unfold from the center of the whorled leaf, and the oldest ones die off beneath it. Such a high rate of leaf senescence is physiologically wasteful [23]. Giant taro leaves were purchased by farmers who traditionally grew fodder in their fields and gardens. The leaves (leaves and stems) were harvested by picking only the mature leaves and stems from the taro [24].

Harvesting the Taro

Harvest when the main tubers begin to push out of the soil surface. Harvesting the plant requires manually breaking and loosening the tubers and their suckers. Pull out the bulb by hand and wash it with water to remove the roots and soil. Bulbs take 12-18 months to mature, but leaves can be harvested 2-3 times a year [25].

Conclusion

Taro *Alocasia macrorrhiza* tuber is an excellent source of carbohydrate ions, dietary fiber and total ash, complies with biochemical assessments and is highly regarded as a health protection plant for people worldwide. *Alocasia macrorrhiza* can protect plasma lipoproteins from oxidation and significantly enhance plasma antioxidant capacity. *Alocasia macrorrhiza* has various phytochemical and pharmacological

properties as described in this article. However, more clinical and pathological studies need to be conducted to investigate the potential activities of bioactive compounds in this plant. Many root crops and tubers around the world are grown in hot and humid regions for vegetable use. Most of them contain starch as their main carbohydrate. They are an important part of the human diet and offer variety. Taro (*Colocasia esculenta*) belongs to the staple root and tuber crops grown for various purposes. Taro tubers offer many desirable nutritional and health benefits. Taro root is used as a vegetable and is considered a rich source of carbohydrates, protein, minerals and vitamins. Taro contains 70-80% starch.

Discussions

This review proved that yam is a viable alternative raw material for papermaking. For the business side of the study, a business plan was developed that included marketing, organizational and financial projections. The study clearly shows that the Taro Paper manufacturing and marketing business has great potential for success. It has clearly demonstrated anti-inflammatory, anti-scurvy, anti-spasmodic, anti-diarrheal, and anti-tumor effects. With so many unexplored indications and ingredients to be discovered, the genus *Alocasia* is the subject of medicinal research. It is a suitable plant for it is also important to note that while this genus has medicinal benefits, there are also toxicological studies that require caution.

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