COLOCASIA ESCULENTA : PHARMACOGNOSTIC AND PHARMACOLOGICAL REVIEW

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ABSTRACT

Colocasia esculenta is a tropical plant grown primarily for its edible corms, the root and vegetables. It is most commonly known as taro and is widely cultivated in the high rainfall areas under flooded condition usually by small farmers. This study details about morphological characters of taro and their use as food and; region and season of cultivation Colocasia esculenta leaves possess vital nutritive and nonnutritive components in significant amounts, but are underutilized, and lesser explored. The chemical composition varies significantly depending upon climatic conditions and other agronomical factors of the location of cultivation and variety. Micronutrients, viz. iron (3.4–11.7 mg 100 g–1), copper (0.29–0.8 mg 100 g–1), magnesium (170–752 mg 100 g–1), potassium (0.4–2.4 g 100 g–1), and zinc(0.6–4.2 mg 100g–1) are present in high amounts. The ratio of sodium to potassium (1:40) in the leaves add specifically to the antihypertensive properties. Preclinical and clinical studies provide evidence of its antidiabetic, antihemorrhagic, neuropharmacological properties, and as a remedy for stomach and liver ailments. Assessment of phytochemical compounds like chlorogenic acid, anthraquinones, cinnamic acid derivatives, and other phenolics validates these biological properties. The major limiting factor of this plant is oxalate that can be suppressed through food processing strategies. Colocasia leaves are promising green leafy vegetables with nutritional and clinical potential.

Keywords: *Colocasia; taro leaves; edible; medicinal; morphology; antimicrobial; diabetes*

1 | INTRODUCTION

Sauces are generally used to treat cardiovascular, liver, central nervous system(CNS),digestive, and metabolic diseases. Given their eventuality to produce significant remedial effect, they can be useful as medicine or supplement in the treatment or operation of colorful conditions. Herbal medicines or medicinal shops, and their excerpts and insulated composites have demonstrated a wide diapason of natural conditioning. [1] system of drug forms the base for an ideal approach in the development of new medicines from shops. One similar factory is Colocasia eatable Linn. Taro(Colocasia eatable Linn.) is vegetative propagated tropical root having its origin from South- east Asia. It occupies 9th position among world food crops with its civilization spreaded across Africa. Taro tubers are important sources of carbohydrates as an energy source and are used as staple foods in tropical and tropical countries. It's largely produced for its underground corms contain 70 – 80 bounce. There are multitudinous root and tuber crops are grown in the world. Taro is one of similar crops grown for colorful purposes. It's an standing herbaceous imperishable root crop extensively cultivated in tropical and tropical world belonging to rubric Colocasia in the factory family called Araceae.[2]

1.1 | Vernacular Names [3]

English: Taro
Bengali: Alti Kachu, Kachu
Gujarati: Aalavi, Patarveliya
Hindi: Arvi, Kachalu
Kannada: Kesavedantu
Malayalam: Chempu, Madantha, Chempakizhnna
Marathi: Alluu
Sanskrit: Alupam, Alukam
Tamil: Sempu

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1.2 | Taxonomy classification [3,4]

Kingdom: Plantae

Subkingdom: Tracheobionta

Superdivision: Spermatophytes

Division: Magnoliophyta

Class: Liliopsida

Subclass: Arecidae

Order: Alismatales

Family: Araceae-Arums

Genus: Colacasia schott

SEED

Species: Colacasia esculenta(L)

STEM

2 | TOXONOMY AND MORPHOLOGY OF COLOCASIA

2.1 | TOXONOMY

Colocasia esculenta(L.) Schott generally called taro or cocoyam(Family Araceae), is a imperishable herbaceous factory, with large globular corm from which a many heart- shaped leaves crop at the tip on long petiole reaching 1- 2m height. The splint Peduncle shorter than the petiole, spathe pale unheroic, to 35- cm long; tube greenish, oblong ; The lamella is hardly lanceolate, convolute, acuminate and twisted slightly backward in flower womanish inflorescence is short but the manly inflorescence is long, spherical, and generally interposed neuters between the two. manly flowers 3- 6 androus , womanish flowers 3- 4 gynous; ovary elliptical or oblong. The stem is slightly swollen at the base of the splint- pods [5] Taro is related to Xanthosoma and Caladium, shops generally grown as ornamentals, and like them it's occasionally approximately called giant observance. Taro which is made up of at least 100 rubrics and further than 1500 species It has been reported as corms of the wild taro can not be used as food due to an extremely high attention of calcium oxalate chargers [6,7]

2.3 | MORPHOLOGY

Morphological taro characterization can be done grounded on its corm, stolon, splint, petiole and flowery characters and other quantitative traits.According to Lebot etal. there was high morphological variability in taro accessions in Southeast Asia and Oceania The variability with regard to morphological traits includes colour, shape and size of tuber, petiole length and colour, and stolon conformation. also, Manzano etal reported presence of topmost morphological variability in root colour, cormel meat colour, corm dry matter chance, corm shape and cormel shape in Colocasia esculenta collected from Asia, Africa and America[8,9] taro seldom flowers and when flowers occurs the inflorescence consists of a cylindrical spadix of flowers enclosed in a 12-15 cm spathe resulting unisexual with the female flowers located at the base of a spadix and the male flowers at the top[10]

3 | NUTRITIONAL AND ANINUTRITIONAL ASPECTS

3.1 | NUTRIENTS

Fresh Colocasia leaves have a high humidity content of79.83 –90.6. The leaves have protein content in the range of 18 –30.7 g 100 g – 1(DM) that can form a significant source of important amino acids in vegan diets. Colocasia leaves house major amino acids like leucine, isoleucine, valine, phenylalanine, and tryptophan. The quantum of vitamin C(26.35 –82.6 mg 100 g – 1) and carotenoids(268.2 mg 100 g – 1) present in leaves contributes toward the antioxidant parcels. The quantum of iron in Colocasia leaves(3.4 –11.7 mg 100 g – 1) is further than that present in mustard and spinach leaves. These nutrients signify its implicit part in skin and blood health. No major difference from other flora is set up in the attention of ascorbic acid, phylloquinones, calcium, sodium, phosphorous, magnesium, and potassium. As per the data presented in Indian Food Composition Tables 2017, Colocasia leaves have a low sodium – potassium(Na/ K) rate of 140 The protein and salutary fiber content of raw Colocasia leaves are advanced than other important green leaves. The leaves have a good quantum of niacin, that is,7.12 mg 100 g – 1 DM which is roughly 50 of the salutary reference input(DRI). Niacin plays a major part in the regulation of metabo -lism. It's also set up to help and treat hepatic and cardiovascular conditions by the inhibition of oxidative stress and by inhibiting the enzymes involved in liver triglyceride conflation, thereby reducing blood situations of low viscosity lipoproteins(LDL) and veritably low - viscosity lipo -proteins(VLDL) and adding high - viscosity lipoproteins(HDL) situations [11,12,13,14]

3.2 | ANTINUTRITIONAL

oxalate chargers in the form of protective raphide idioblasts each over the plant The oxalate chargers are also responsible for order gravestone conformation. This acridity can be removed by cooking or fermentation The viscosity of crystal clear cells is smallest in aged leaves The study conducted on 11 different Indian green leafy

vegetables high total oxalate attention in Colocasia leaves(5,138 mg 100 g – 1 dry matter) which was lower than spinach and amaranthus but further than curry leaves and radish leaves [15,16,17]

4 | MEDICINAL USES

4.1 | ANTIHEMORRHAGE

The pressed juice attained from the petiole of Colocasia leaves is styptic or tangy and can arrest arterial hemorrhage Although not completely established, the medium of action involves a high position of acidity due to caffeic acid and cinnamic acid Phenolic composites can also contribute [18,19,20]

4.2 | ANTICANCER

Cancer is a leading cause of death worldwide, and it's substantially related to unhealthy food habits and life It's important to find ways to reduce and help the threat of cancer through salutary factors, which are present in factory foods. Cancer is a multistage complaint condition and tapping at any original stage could help devaluate the complaint condition. Root and tuber phytochemicals have demonstrated anticancer goods in several types of melanoma cell lines and beast models [21]

4.3 | ANTIDIABETIC

The present study suggested that ethanol excerpt of C.esculenta(EECE) leaves were subordinated to anti-diabetic exertion on blood glucose position and on the body weight in alloxan convinced diabetic rats in boluses of EECE(100, 200 and mg/ kg) and metformin(450 mg/ kg) were administered orally in alloxan(120 mg/ kg,i.p.). The result demonstrate significant($p<0.001$) blood glucose lowering effecti.e observed reduction in blood glucose was(174.34 mg/ dl) at the cure of 400 mg/ kg on 14th day [22]

4.4 | ANTIMICROBIAL AND ANTIFUNGAL

C. esculenta shows the antimicrobial exertion of chloroform and methanol excerpt by agar prolixity system. In this studies chloroform and methanol excerpt shows in several cure similar as 20, 10, 5,2.5,1.25,0.625,0.3125 mg/ ml against some named strains was measured and compared with standard antibiotics tetracycline in cure of 5,2.5,0 .625,0.15625,0.078072 mg/ ml(16). Waterless excerpt of C.Esculenta was conducted in gram positive i.e Streptococcus mutans(MTCC- 890), Bacillus subtillis(MTCC- 121) and gram negativei.e Klebsiella pneumonia(MTCC- 109), Pseudomonas fragi(MTCC- 2458), Escherichia coli(MTCC) as well as fungal strains Aspergillus niger(MTCC- 281) Candida albicans(MTCC- 227). The results displayed good exertion against tested organisms [23]

5 | OTHER CLINICAL USES

Dry vegetable medication made from Colocasia leaves can help in relieving constipation and hence act as a laxative The Colocasia leaves can be used for stomach cooling and to cure stomach affections It is also used to treat gastric problems like dysentery and gas troubles reported its use as a diuretic. Leaves mixed with tubers can also be used to treat heat stroke and sunburns The methanol excerpt of Colocasia leaves has been reported to have antinociceptive goods Leaves mixed with tubers have been reported to have medicinal parcels against ringworm The high content of Vitamin A precursors makes the leaves suitable for perfecting eye sight Leaves except, mixed with sugar and consumed daily is one of the herbal treatment styles of hemorrhoids [24,25,26,27,28,29]

6 CONCLUSION

Colocasia leaves are rich in micronutrients and nonnutrients that justify its application in functional foods development. The study of the nutritional profile of leaves revealed that they are rich in essential aminoacids, and B vitamins. Apart from this, Colocasia leaves have a balanced ratio of sodium–potassium that plays an important

in the proper functioning of the human circulatory system. The documented biological properties of Colocasia leaves lack sufficient human-based clinical studies. The presence of active chemical compounds like catechins, anthroquinones, chlorogenic acid, apigenin, scoparin, vitexin, and isovitexin, however, validates the evidence of its biological properties, making these promising constituents for food as well as pharmacological industry.There is a lack of awareness about the nutritional importance of Colocasia leaves, and hence the utilization of these leaves remains confined to the areas of cultivation. Clinical investigation and assessments of the functioning of active compounds is suggested to understand the synergistic and antagonistic effects of nutrients and nonnutrients among themselves. Investigations on the effects of food processing methods on the activities of the phytochemicals are also recommended to substantiate its clinical efficacy. Once sufficient clinical evidence is established, action on the popularization of its nutritional value can be taken, and the leaves can be utilized in the development of value-added food products like fortified cereal-based products, herbal beverages, and traditional food products.

6 | REFERENCE

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