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Review Article

BEST WEIGHT LOSS: BOTTLE GOURD

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ABSTRACT

Bottle gourd *(Lagenariasiceraria)* is a green colour, longitudinal vegetable synonym calabash gourd belongs to the family cucurbitaceae. Bottle gourd most probably originated in tropical Africa, and occupies first place in India. It is only the crop known to have been cultivated in pre- columbian times in both the world and new world. Bottle gourd extracts of the plant shows antibiotic activity rich in vit-C, and thiamine. The fruit pulp is used as emetic, purgative, diuretic. Bottle gourd is also considered of the best weight loss. Bottle gourd reported activities are free radical scavenging activity, antioxidant activity, lipase inhibitory activity, diuretic activity, cardio protective activity, antimicrobial activity, lipid lowering activity, hepato toxicity activity.

Keywords: Bottle gourd *(Lagenariasiceraria) and* free radical scavenging activity.

INTRODUCTION

Bottle gourd *(LAGENARIA SICERARIA)* is also called as white-flowered gourd[1] or Calabash gourd**.** It is known by many other names like Long melon and Tasmania bean[2.]These fruits are mostly cultivated in warm climates. The gourd was one of the first cultivated plants in the world. It probably originated in Africa floating in sea to India, china, and New Zealand.

The young fruits are edible and usually cooked as vegetable has cooling, diuretic, sedative and anti-bilious action. The matured gourds are made into water bottles, spoons, containers, pipes. They can also fashioned into ornaments, musical instruments[3], lamps. Gourd is vine grown for its fruit**.** The bottle gourd may have been carried from Africa to Asia, Europe, and the Americas in the course of human migration[4.]

They grow in variety of shapes

Huge and rounded, small, bottle shaped and more than a meter long.

1.1 scientific classification

Kingdom	Plantae
Sub kingdom	Tracheobionta
Division	Magnoliophyta
Super division	Spermatophyta
Class	Magnoliopsida
Sub class	Dilleniidae
Order	Violales
Family	Cucurbitaceae
Genus.	*Lagenaria* ser.
Species	*Lagenariasciceraria*Standl

1.2 Synonyms

Lagenariasiceraria, calabash, calabash tree, gourd vine

1.3 Geographical distribution

Bottle gourd is most probably originated in tropical Africa and occupies first place in India, china New- Zealand. It could have been spread by ocean currents to shores of the new world**.** More than 10,000 year old archeological records of its association. It is the only crop known to have been cultivated in pre-

columbian times in both the world and new-world.

1.4 Cultivation and collection

Gourds were cultivated in Africa, Asia, Europe and the America for thousands of years before Columbus' discovery of America. Historically,In Europe,[5.] Walahfrid Strabo abbot and poet from Reichenau and advisor to the Carolingian kings, discussed the gourd in his Hortulus as one of the 23 plants of an ideal garden[6,7]. Bottle gourd is one of the popular vegetable crops cultivated in south East Asia. These vegetables are mostly grown in India and fruits are available in throughout the world. Bottle gourd usually comes to harvesting in 3 months and these flowers are white in colour and opened at night time.

a) Climate

Hot and moist climate is favorable for its cultivation.

b) Soil and its preparation

Bottle gourd can be grown in any type of soil but sandy loam soil is best suited for its cultivation. The land should be prepared thoroughly by five to six ploughings.

c) Time of sowing and layout

sown from January The seed is to end of February for summer crops. June to July for rainy season crop.

d) Methods of sowing and spacing

The seed is sown by dibbing method. Generally three to four seeds are sown. Now-a-days bottle gourds are grown by direct sowing of seeds 15to20 days. It is cultivated in small places such as in a pot and spread on a roof. In rural areas, many houses with thatchedroofs are found covered with the gourd vine. Bottle gourd grow very rapidly and their stems can reach a length of 9m in the summer. So, they need a soil support to climb. To get more fruit, sometimes farmers cut off the tip of the vine when it has grown to 6-8 feet long. The plant produces side branches that produce fruit much sooner and more flowers and more fruit. The plant produces white flowers. The male flowers have long peduncles and the females have short ones with ovary shape of the fruit. Sometimes, the female flowers are drop off without growing into a gourd due to failure of the pollination.

1.5 Morphology

Dark green in colour, characteristic odourbitter taste.*Lagenariasiceraria*is 7.9-15.5 cm long, elliptical shaped having entire margin and parallel venation.Leaves are simple,upto 400mm long, and 400mm broad,longpetioled, 5-lobed, softly hairy, crushed leaves are nonaromatic.Leaf stalks upto 300mm long, hollow, densely hairy, small and lateral glands are inserted at the leaf base. Margins are shallowly toothed. The apex of the plant is leathery surface with firm texture. Flowers are stalked(female flower stalks are shorter than the male flower stalk),unisexual, axillary, 5petals, cream or white coloured with darker veins, ovate, pale yellow at the base, flowers are opening in the evenings. Fruits are large, cylindrical, flask shaped constriction above the middle. Seeds are many, embedded in a spongy pulp, compressed, in some variants rather irregular and rugose.

1.6 Microscopy

Transverse section of*lagenariasiceraria*leaf shows the following features

upper epidermis consist elongated parenchymatous cells, covered by cuticle and also shows few stomata, which are of anisocytic type,palisade cells are also present.Lower epidermis consist elongated wavy walled parenchymatous cells covered by cuticle,shows hexagonal to polygonal,large, thin walled colourless cells. Trichomes are present, while very few glandular trichomes are also present. Mesophyll is made up of 3-4 layered chloroplast containing, compactly arranged, oval to circular cells. Vascular bundles are surrounded by 2-3 layered sclerenchyma.They are closed, collateral, conjoint. Xylem is placed towards the upper epidermis and phloem towards the lower epidermis.

1.7 Chemical constituents

Fruits of the sweet variety contain carbohydrate, fat, calcium and phosphorous, fibres. Other mineral elements include iodine, sodium, iron. The fruit is considered as good source of vitamin C, vitamin B complex and also contains the highest level of choline-a lipotropic factor[8,9]. The fruit skin contains crude protein, lignin and cellulose.

1.8 Traditional uses

- ✓ The fruit pulp is used as a emetic, purgative, diuretic, cooling, sedative and pectoral.
- ✓ Bottle gourd is believed to help the liver function in a balanced fashion
- ✓ The fruits, leaves, stem, seeds and oils of “Lagenariasiceraria” are traditionally used in the treatment of diabetes, ulcer, cardiac failure, hypertension, and skin diseases
- ✓ Leaves are used as alternative purgative

- ✓ Leaf juice is widely used for baldness
- ✓ The stem bark and rind of the fruit are diuretic
- ✓ The flowers are an antidote to poison
- ✓ Extracts of the plant shows antibiotic activity
- ✓ It is rich in thiamin, vitamin C, iron, zinc, and magnesium thus helping in improving overall health.
- ✓ Bottle gourd is also considered one of the best weight loss foods.

II. PHARMACOLOGICAL ACTIVITIES

2.1 FREE RADICAL SCAVENGING ACTIVITY

The authors are reported, the acetone extract of bottle guard shows free radical scavenging activity. The fruit was collected and epicarp,mesocarp and pulp containing seeds were separated. Each of them was extracted with different solvents in increasing order of polarity. The author revealed that the maximum antioxidant[10] was observed in the acetone extract of fruit epicarp.Chemical investigation revealed that radical scavenging activity may due to the presence of ellagitannins present in the acetone extract of epicarp[11].

2.2 LIPASE INHIBITORY ACTIVITY

Aqueous extract was prepared through hot decoction method. The study suggests that *LAGENARIA SICERARIA* has potential to inhibit pancreatic lipase activity,[12] supressing lipid digestion and there by diminishing entry of lipids in to the body Regular intake of aqueous decoction of the fruit may therefore be recommended for control of obesity.Fatty acids and their esters may play role as inhibitors of lipase[13].

2.3 ANTIOXIDANT ACTIVITY

Bottle gourd juice was extracted and dried through vaccum distillation to obtain dry mass, followed by freeze drying to get semisolid mass for the purpose of qualitative and quantitative phytochemical analysis. Whole bottle gourd powder and pulp powder remaining after juice extraction was also analysed[14]. Antioxidant activity was assessed by 1-1,diphenyl-2-picrylhydrazyl radicle reducing capacity which showed IC50 value.Total flavonoid content was assessed by applying method given by ordonaltho method given by kumaran for the analysis of totalflavanoids and flavanols[15] in WBGP,which is the indicator of presence of antioxidant compounds in bottle gourd and its byproducts which are reported to be beneficial for health specially to combat metabolic stress[16]

2.4 DIURETIC ACTIVITY

Bottlegourd is used as diuretic, cardiotonic, cardioprotective and nutritive agent. The Fruit is also reported to have good source of vitamin B complex and choline along with vitamin B complex and choline along with fair source of vitamin c and B-carotene.The study relieve pulmonary congestion and peripheral edema.These agents are useful in reducing the orthopnea and decreasing blood pressure and play an important role in hypertensive patients.The LSJE and LSME were found to be active in renal system of rats. It shows maximal activity on dose response studies[17]. The author reported that LSJE LSME act as effective hypernatremic,hyerchloermic and it has hyperkalemic diuretics and it has dose dependent diuretic activity[18]. The vaccum dried extract and methanol extract of *LAGENARARIA SICERARIA* was evaluated for its diuretic activity. Both the extracts showed urine volume and exhibited dose dependent increased in excretion of electrolytes the author revealed that it indicate potent diuretic activity of AELS and there is a significant increase in excretion of urinary volume, urinary Na+ and cl^{-}[19].

2.5 CARDIOPROTECTIVE ACTIVITY

Bottlegourd fruit extract juice in myocardial infraction. Myocardial infraction was induced in male wistar rats by administration of isoproterenol. *LAGENARIA SICERARIA* fruit juice was administered for 30 days as prophylaxis treatment. *LAGENARIA SICERARIA* epicarp extract prevented biomarkers of oxidative stress in doxorubicin induced cardiotoxicity.[20] It contains flavonoids glycoside, phenolic components and saponins. The author reported that it has cardiopdodective activity and fruit juice have some good effects at the level of infraction[21]

2.6 ANTIMICROBIAL ACTIVITY

LAGENARIA SICERARIA fruit extract exhibited antifungal and antibacterial against selected pathogens using agar diffusion method and the minimum inhibitory concentrations varied between 0.002 and 0.100g/ml. The phytochemical screening of the different seeds extracts revealed the presence of phlobatannins, phenols, deoxysugar, carbohydrates and reducing sugars in variying quanties. The author reported that it contain proven potential to contain microbial agents and microbial activity[22].

2.7 HYPOLIPIDEMIC ACTIVITY/LIPID LOWERING ACTIVITY

LAGENARARIA SICERARIA fruit extract induced hyperlipedemicwistarrats. Aqueous

fruit extract given orally at the dose of 200 and 400 mg/kg was given to high cholesterol diet induced hyperlipidemicrats. After eight weeks of dosing the antihyperlipidemic activity was assessed by serum lipid levels.The author reported that fruit extract cause a significant reduction in serum lipid levels and increase in high density lipoprotein cholesterol and shows a significant antihyperlipidemic potential[23]
LAGENARIA SICERARIA freshly prepared fruit extract administered daily on empty stomach for 90 days. Significant reductions found in triglycerides appreciable reductions in body mass index and blood pressure along with a significant reduction in fasting blood glucose levels. It shows dietary adjunct in treatment of human dyslipidemia and cardiovascular disease. The author reported that fruit extract exhibited significant lipid lowering activity[24].

2.8 HEPATOTOXICITY ACTIVITY

Antitubercular drugs and bottlegourd fruit extractin healthy albino rats by oral route for 15 day .On 16th day blood collection for biochemical analysis is done by cardiac puncture.Biochemical markers used are serum transaminases,serum alkalinephosphatase total bilirubin,total protein, super oxide dismutase and malondialdehyde.The above ethanolic extract of *LAGENARARIA SICERARIA* fruit extracts possess significant hepatoprotective and antioxidant activity in antitubercular drugs induced hepatotoxicity[25].

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