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An Extensive Review of Nutriment and Cytotoxicity of Air Potato *(Dioscorea bulbifera)*

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Air potato is a twinning, long stemmed perennial vine. It is an interesting plant which climbs trees or by expanding it out on structures like panels. Tubers are suspended in air. Originated in Florida, flowering are seen during October and November at the University of Florida herbarium plants**.** It has many nutritional impact. 11.61% crude fiber, 20.44% crude protein ,71.46% of carbohydrate. Which acts as organic solvent, and cure many disease. Tumour are widely cured by air potato, 75% ethanol are extracted from rhizomes which prevent the development of tumour cells. Atherosclerosis is inflammation on arteries which cause cardiovascular disease. Air potato has high content of fiber, potassium and antioxidant. It contains some toxic compounds as diosbulbin that causes health effects to humans. They are toxic to humans and animals when ingested in high dose. The foremost common symptoms observed are damages to liver, kidney, gastrointestinal irritation, dizziness, nausea. Some of the methods are used to detoxify the toxin content of air potato are, multiple boiling, sun drying, Fermentation, roasting, chemical detox.

Key Words: Aerial Yam, Streptozocin , Atherosclerosis, Toxicity.

Introduction

Air potatoes botanically classified as *Dioscorea bulbifera* is a twining, long-stemmed perennial vine**.** It is also dubbed as air yam, bitter yam, cheeky yam, potato yam, aerial yam and parsnip yam is a species of true yam in the yam family, Dioscoreaceae. It is an interesting plant which climbs trees or by expanding it out on structures like panels. Tubers are suspended in air. The stem about 70 feet in length and is round or oval or irregular shape. Fit for human consumption of the plant is yam. Originated in Florida, flowering are seen during October and November at the University of Florida herbarium Plants. It is dioecious where male and female are present on separate individuals. It is grown in tropics and subtropics and domesticated in many places. Anciently grown in Asia foreword to Africa. Edible portion is round or oval and aerial bulbils of 10-15 pieces per vine with 5 cm to 30 cm width and height. Per yam 50 g to 1 kg weight. Average of 200 bulbils are able to be produced by a single plant in one growing season. *Dioscorea bulbifera Linn*, has many therapeutical value, prevalent in Ayurveda. Tuber has high protein content. Compared to other yam crops. Crude protein content of air potato is high (5.6%) and cassava (1.2-1.8%). It is better food for patients who is suffering from atherosclerosis or related ailments. Saponin content of the potato is high (24 mg/g). It has poisonous effect, that gives bitter taste due to cytotoxicity. Which also provide flavonoids, tannins, cardiac glycoside and terpenoids. This toxicity may be reduced by food processing.

Nutritional effects

Dioscorea bulbifera l. has many nutritional impact. 11.61% crude fiber, 20.44% crude protein ,71.46% of carbohydrate. Which supply many mineral source such as Zn (1.21),

Fe(7.53), Mn (0.78), K(60.65) which are in mg/g. Maximum level of phenols, tannin and sapoin are produced by air potato, which also produce more amount of flavonoid (2.77mg/g) and ethanol (3.05mg/g). Which acts as organic solvent, and cure many disease. Tumour are widely cured by air potato, 75% ethanol are extracted from rhizomes which prevent the development of tumour cells. Glycose and streptozocin induced to rats which shows significatant activity.

Country and utilization: Table: 1

India	In India air potato gives many medicinal values such as tissue rejuvenation, digestion, tuberculosis. Rasayana which is called by Shusruta.
China	Air potato which is used to treat certain bites such as snake and dog
Bangladesh	To treat disease Used such as Hansen disease and cancer.
Brazil	Tubers are to treat digestion problems.

Antiatherosclerosis: Atherosclerosis is a inflammation on arteries which cause cardiovascular disease. Air potato has high content of fibre, potassium and antioxidant. anti-inflammation effect on its benefit sides of air potato, may prevent the inflammation of the arteries.

Toxicity: Air potato contains some toxic compounds as diosbulbin that causes health effects to humans. They are toxic to humans and animals when ingested in high dose. Study reveals that high dose *of D.bulbifera* suppress the immune system while medium dose improves the immune system in mice.The foremost common symptoms observed are damages to liver, kidney, gastrointestinal irritation, dizziness, nausea. The symptoms range from abdominal discomfort to organ disfunctioning depending upon the dose of intake. The toxins present in air potato will lead to effects as

- Heptotoxicity,
- Nephrotoxicity
- Neurological effects
- gastrointestinal effects

Detoxing methods: Some of the methods are used to detoxify the toxin content of air potato are,

- Multiple boiling,
- Sun Drying,
- Fermentation,
- Roasting and
- chemical detox.

Traditional detoxification methods are multiple boiling as boiling the tubers around 3 to 5 times will reduce the toxin level as diosbulbin is a water soluble toxin, enabling the air potato as edible one. Multiple boiling is the most effectively used common method.

Sun drying for upto 5-7 days will reduce the moisture content and partially degrades the toxin content and it is used commonly in India and Southeast Asia. As in fermentation process the sliced tubers are packed with salt and rice water and allowed to ferment for few days in which the toxins starts to degrade during fermentation.

Chemical detox as Alkaline hydrolysis is done by using the Sodium hydroxide 0.1% or Sodium bicarbonate 2%. Tubers are soaked in chemicals and kept for 1 day and then thoroughly washed for consumption.

Conclusion

The extensive study of nutriment and toxicity of air potato highlights its dual potential as both the valuable food source and plant with toxicological risk. While certain varities of air potato are rich in essential nutrients such as carbohydratres, fibers and beneficial cytochemicals others contain harmful chemicals like diosbulbin, which can pose significant health risks. Therefore, identification of safe cultivars, appropriate detoxification methods, and public awareness are critical for promoting its safe utilization. Further research and

extension efforts are necessary to balance its nutritional benefits with safety concerns, paving the way of sustainable use in food system.

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