



Snake gourd (*Trichosanthes cucumerina*) – A Basketful of Bioactive Compounds and Health Benefits

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INTRODUCTION

Trichosanthes cucumerina is a plant whose fruit is mainly consumed as vegetable and is commonly known as Snake Gourd, viper gourd, snake tomato or long tomatoes in many countries. It belongs to Cucurbitaceae family and is commonly grown in Sri Lanka, India, Bangladesh, Nepal, Malaysia and Philippines. The name snake gourd is given due to its long, slender, twisted and elongated snake-like fruits. It is an annual vine climbing by means of tendrils (Mohammad Pessaraki, 2016). The soft-skinned immature fruit can reach up to 150 cm (59 in) in length. It's soft, bland, somewhat mucilaginous flesh is similar to that of the luffa and the calabash. It is popular in the cuisines of South and Southeast Asia and is now grown in some home gardens in Africa. With some cultivars, the immature fruit has an unpleasant odor and a slightly bitter maturity, but it does contain a reddish pulp that is used in Africa as a substitute for tomatoes. The shoots, tendrils and leaves are also eaten as greens (Wayback Machine, 2013). *Trichosanthes cucumerina* falls under scientific classification of:

| | |
|----------|---------------|
| Kingdom | Plantae |
| Division | Magnoliophyta |
| Class | Mangoliopsida |
| Order | Curcubiales |
| Family | Cucurbitaceae |
| Genus | Trichosanthes |
| Species | Cucumerina |

Snake gourd is substituted for solanaceous tomato because of its sweet taste, aroma and deep red endocarp pulp when fully ripe. This prevents the fruit pulp from turning sour as quickly as tomato paste (Adebooye & Oloyede, 2006).

Cultivation of snake gourd during off season, when tomato prices are high, is economical and fetches good income to farmers. The good food value of this plant is an indicator that its cultivation and utilization should be promoted (Oloyede & Adebooye, 2005).

Composition and human nutrition

This fruit is rich in vitamins C and A as well as proteins, fats fibers, carbohydrates and vitamin E. The total phenolics and flavonoids

contents are 46.8% and 78% respectively (Adebooye, 2008). The predominant mineral elements per 100 g are potassium (121.6mg) and phosphorus (135mg). The seed contains some amount of sodium, calcium, potassium and magnesium. The snake gourd seed are considered as oil seed with appreciable high level of crude protein and ash. The overall composition of fruit and seed is shown in table.

Proximate composition of snake gourd fruit and seed

| Parameters | Fruit (Ojiako and Igwe 2008) | Seed (Adesina and Amoo 2014) |
|--------------|------------------------------|------------------------------|
| Moisture | 94.6% | 5.21% |
| Ash | 2.50% | 2.93% |
| Fiber | 0.8g/100 g | - |
| Protein | 0.50g/100g | 28.59% |
| Carbohydrate | 3.30g/100g | 10.60% |
| Energy | 18 kcal | - |
| Fat | 0.3g/100g | 51.53% |
| Calcium | 50mg/100g | 1.43% |
| Phosphorus | 135 mg/100g | 1.35% |
| Sodium | 25.4mg/100g | 5.06% |
| Potassium | 121.6 mg/100g | 1.10% |
| Magnesium | 53mg/100g | 0.76% |
| Vitamin A | 160UI | |
| Thiamin | 0.04mg/100g | |
| Riboflavin | 0.06mg/100g | |
| Niacin | 0.30mg/100g | |
| Vitamin C | 5.0mg/100g | |
| Oxalic acid | 34mg/100g | |

Phytochemicals

Phytochemicals in the form of Triterpenes are found as 23, 24-dihydrocucurbitacin D, 23, 24-dihydrocucurbitacin B, and cucurbitacin B. The bulk of carotenoids are made up of lutein are present in the concentration of 15.6-18.4mg/100g. Positive effects due to the carotenoids, flavonoids, lycopene, phenolics and beta-carotene present in it (Patil & Bhole, 1993).

Health Benefits

Trichosanthes cucumerina is used in the treatment of headache, alopecia fever, abdominal tumors, bilious, boils, diarrhea and skin allergy (Nadkani, 2002). The plant has a promising role in Ayurvedic and Sidhha system of medicine due to its various medical values like antidiabetic, hepatoprotective, cytotoxic and anti-inflammatory effects. The extract of aerials parts *Trichosanthes cucumerina* with hot water has shown to improve glucose tolerance and tissues

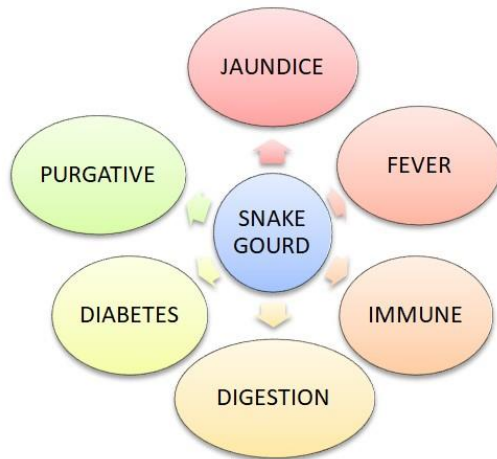
glycogen in non-insulin dependent diabetes mellitus induced rats. Hot water extract of *Trichosanthes cucumerina* has shown a significant protection against ethanol or indomethacin induced gastric damage increasing the protective mucus layer and decreasing the gastric juice (Arawwawla et al., 2009).

Root – Root extracts are used for diabetes, skin swellings like boils and furuncles. Root is antiseptic and astringent (Yusuf, 2007).

Leaf – Leaf extract is rubbed over whole body in remittent fevers. Leaf is alexiteric, astringent, diuretic and emetic (Yusuf, 2007).

Fruit–Fruits are effective in assisting digestion. The fruit is considered to be anthelmintic (Yusuf, 2007).

Seeds – the seed is said to be have cooling properties. The seeds in dried form are used for its anthelmintic and anti- diarrheal properties (Yusuf, 2007).



CONCLUSION

The snake gourd has many health benefits and widely used to cure many diseases. The immature fruits are used as salad and also cooked as vegetable in various ways. The fruits have an unpleasant odor that disappears after cooking. The fruit increases appetite, acts as a tonic and stomachic. The plant has many beneficial compounds, the knowledge of which could help in the prevention of many diseases and maintenance of good health. This article was written with an aim of giving an overview of the health benefits of snake gourd. However, more research is required to explore its potential and medical benefits.

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