

Phytochemical and Elemental Analysis of *Trichosanthes cucumerina* (Snake Gourd)

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ABSTRACT

Psychochemical and elemental analysis of *Trichosanthes cucumerina* seed was extracted by soxhlet using n-hexane, it shows the presence of alkaloid, glucosides, tannis and glycoside. It was characterized by atomic Absorption Spectrophotometer and revealed the presence of magnesium 280.00mg/100g, Potassium 240.00 mg/100g, calcium 15.20 mg/100g, copper 8.2 mg/100g, iron 4.2 mg/100g and zinc 0.05 mg/100g, the Infra-Red Spectroscopic Analysis revealed strong bonds at 1643 and 3012 cm⁻¹ strongly which are C = C and C – H stretching of olefins. This indicates that the seeds are useful medicinally and are good antioxidant.

Keywords: Analysis, Element, Infra-Red, Phytochemicals, *Trichosanthes cucumerina*

INTRODUCTION

Trichosanthes cucumerina could be classified as oilseed plant. *Trichosanthes cucumerina* var. anyuina (L) Haines is a vegetable cultivated in gardens in Nigeria. In South west, it is called "Tomato elejo". The pulp of the ripe fruit is a good substitute for tomatoes paste. It is well adapted to growth in high rain forest. It does not withstand dry soil conditions and requires a plentiful reserve of moisture in the soil Akinni, (2005). The seeds are flat, grey-brown, sculptured and

narrow at one end about 1.8 cm long Yusuf *et al.*, (2007).

Some studies have earlier showed that the seed oil is the non-drying oil from their iodine values. The seed are excellent source of linoleum and possess a good source of amino acid and a responsible amount of vitamins E and B complex along with minerals like magnesium, ion, zinc and calcium Phan *et al.*, (2000) with a calming effect on the brain. The aqueous extract of the seed is used for treatment of soft tissue wounds,

turns infection and fungi attach in children. It a complex mixture of natural compounds including flavonoids, essential oils, saponins and other trace elements. There is need to utilize chemical information on it to improve our knowledge about the component of the plant. An anticoagulant activity of the leaves and seed oil was identified Francis (2000).

This study investigates the activities of n-hexane extract, the essential metals and active organic compounds found in the seed responsible for its usage in treating various ailments.

MATERIAL AND METHODS

Sample Collection

The seed (ripe) were obtained from the shrubs at NUT road Abraka. The seed were removed from the pulp and air dried at home for three weeks and taken to the laboratory for grinding. The powdered sample was stored in polyethene bag and later use for analysis.

Solvent Extract

60 g of the sample (powdered) was put into a soxhlet extractor using n-hexane as extractor using n-hexane as extracting agent. It was refluxed for about 4 hours. It was evaporated

for an extract of slurry formed at 50 °C. This was collected and stored in the refrigerator.

Photochemical Analysis

The extracts were evaluated for the presence of saponins tannins, flavonoids, glycoside and alkaloids Bohn and Kocipai-Abyzan (1994) and Kneket *et al.*, (2002).

a. Flavonoid Test

3 drops of NH₃ solution was added in 2 ml of the extract, 1 ml of HCl was added. A pale brown colour was observed indicating the presence of flavonoids.

b. Tannins Test

2 drop of 5% FeCl₃ was added to 1 ml of each extract. A dirty-green precipitate was observed in each extract showing the presence of tannins.

c. Emulson Test

5 drop of olive oil was added to 2 ml of seed extract and shaken vigorously in a test tube. A stable emulsion was formed in each extract indicating the presence of saponins.

d. Lieberman's Test (Glycosiders)

2 ml of acetic acid was added to 1 ml of extract and cooled

in ice bath, 1 ml of concentrated H₂SO₄ was added drop wise and oil layer was formed on top of the solution indicating the presence of glycosides.

e. **Alkaloid Test**

2 ml of 1% HCL was added to 3 ml of each extract in a test tube, few drops of Meyer's Wagner's and Drage-endoff's reagent separately was added. A creamy white (Mayer) and reddish (Wagner) and orange brown colouration (Drangeradaff) precipitates were formed indicating alkaloids Aruoma (2008).

f. **Element Analysis**

Aqueous samples from the seed were subjected to analysis using Atomic Absorption spectrophotometer (model 17132 48 V 1.29) for elemental analysis.

IR Analysis

The infra-red spectroscopy of the seed sample extract was carried out with Nicolet Avater 545FT – R using BDH analysis (99%).

RESULT AND DISCUSSION

The results of physiochemical analysis are as presented in Table 1.

Table 1: Extract from seeds of *Trichosanthes cucumerina* seed

Natural Products	Results
Alkaloids	+ ±
Tannis	± ±
Glycosides	± ±
Flavoninds	± ±
Saponins	± ±

Table 1 show that the seeds contain contained alkaloids, tannins, glycosides, flavonoids and saponins after the test sample was treated with ethanol and distilled water. The alkaloids contained in plants are used for treating excessive salivation in Parkinson's diseases

and motion sickness and anaesthetic agents Okiemen *et al.*, (1999). The tonic and stimulating activities in Chinese and Japanese herbs have been attributed to the presence of saponins in plans. The presence of tannins in the plants may be contributed for its use by tradomedical practitioners in

treating wounds and infection. It has been reported that plant extracts containing flavonoids may be responsible for diuretic and antibacterial activities Luttette *et al.*, (1994).

Phenolic compounds are well known as antioxidant and inhibitors of process of oxidation even at relatively small concentrations and thus have diverse physiological role in the body. Antioxidant properties of plant materials act as radical scavengers and help in converting the radical to less reactive species

Kumar (2014). The saponin may give credence to its local use as anti-infectious agents Ogononi and Ochuko (2001).

Herbs either leaves, stems or roots that have tannin in their component are astringent in nature and are used for treating ingestion disorder as dysentery and diarrhea Luttette *et al.*, (1994), thus exhibiting antimicrobial activity. The alkaloid present in snake gourd has amazing effect on human and they are used in producing powerful pain killer medicines

Table 2: Element concentration in the seed of *Richosanthos cucumernia* seed

Element	Concentration (mg/100g)
Calcium	15.20
Magnesium	280.00
Potassium	24.00
Iron	4.20
Copper	8.21
Zinc	0.05

Table 2 shows the results of the Atomic Absorption spectrophotometer Analysis for essential elements. Magnesium has the highest concentration of 280mg/100g followed by potassium (240.01 mg/100 g) and calcium 15.20 mg/100 g. The conversion of

prothrombin to thrombin responsible for blood clotting is accomplished by the presence of calcium ion. Magnesium is responsible for fixing capacity of plants Bohm *et al.*, (1994).

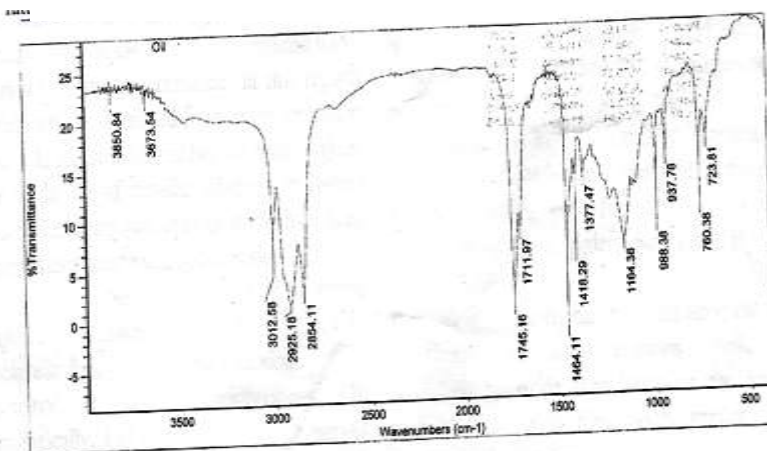


Figure 1: Infra-red spectrum of *Trichosanthes cucumerina* seed

Zinc is necessary for the growth and multiplication of cells (Enzymes responsible for DNA and RNA synthesis) for healthy skin, bone, metabolism and proper function of the eye sight and taste buds Ali (2011).

Copper is also an essential component of many redox enzymes. It is essential for the formation of haemoglobin of the red blood cells. Its deficiency results in anemia like symptoms.

For IR spectrum as shown in figure 1, their peaks confirmed saturated and unsaturated compound with 3012 cm^{-1} which are C–H stretching 1643 cm^{-1} for the olefinic C=C stretching and 3012 cm^{-1} for C – H stretching of the Olefinic. 1745 cm^{-1} for C=O stretching of esters of

triglyceride Ohondoni and Ochuko P. (2001), but free acids are absence Hanna (2004), Kumar (2014), Enujiugha *et al.*, (2005) and Gotoh (2006), while 164 and 3012 cm^{-1} shows the presence of unsaturation in the seed Luttette *et al.*, (1994).

CONCLUSION

This work has shown that the specie of *Trichosanthes cucumerina* seed found in Nigeria contain some classes of natural occurring compounds like alkaloid, protein, glycosides, tannins, flavonoids, which confers properties which are medical in nature.

The high calcium potassium and magnesium contents can serve as important mineral supplement with its attendant minimizing common health problems. The presence of

alkaloids, flavonoids, saponins, glycosides can be exploited to maximum potential

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