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REVIEW ARTICLE!!!

“TRICHOSANTHES: A COMPREHENSIVE REVIEW”**Gill N.S*, Arora Rashmi, Kaur Manjinder, Bala Kiran**¹Department of Pharmaceutical Chemistry, Rayat Institute of Pharmacy, Railmajra, SBS Nagar,
Pb. 144533.**ABSTRACT****KEYWORDS:**

Trichosanthes,
Anticancer, Antitumor,
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Trichosanthes is a chinese cucumber and is a genus of tropical and subtropical vines belonging to family Cucurbitaceae. *Trichosanthes* consist of 90 - 100 species that are found in india to japan and soustest to australia. It is also known as Medicinal as well as Poisonous plant in india. This Plant contain tetra and pentacyclic triterpenes, resins, vitamins, peptides, tannins, saponins, alkaloids, steroids and the toxic bitter principles cucurbitacins, a group of often highly oxygenated tetracyclic compounds. This Plant is used to treat different type of disease. it has been reported that *Trichosanthes* and their species show antidiabetic, antifungal, antibacterial, in skin disorder, hepatoprotective, cholesterol - lowering, antioxidant, wound healing activities. The Present study about *Trichosanthes* reveals up to date information of Phytochemistry and Pharmacological activity.

INTRODUCTION:

Trichosanthes is a vine plant in the Cucurbitaceae family, similar to cucumber and squash, though unlike those it is perennial. It is a dioecious (male and female plants) vine plant with heart – shaped leaves and is grown on a trellis. The fruits are green with white or no stripes. Size can vary from small and round to thick and long – 2 to 6 inches. It is also known as parwal in hindi, Kambupudalai in tamil. It is a good source of carbohydrates, vitamin A and vitamin C ^[1]. According to the WHO, traditional medicine can be used in various conditions like: new anti – malarial drugs were developed from cinchona; a plant used in china for almost 2000 years it is estimated that at least 25% of all modern medicines are derived, either directly or indirectly, from medicinal plants, primarily through the application of the modern technology to traditional knowledge. The non – dialyzable portion of the water extract to the roots of *Trichosanthes* plant was shown to reduce the plasma glucose level in mice. Five glycans termed trichosan A, B, C, D and E obtained through fractionation of this portion showed hypoglycaemic activity in normal mice and trichosan A was also active in alloxan – induced hyperglycaemic mice. The demands of medicinal plants are increasing day by day in developed countries, lack of side effects and easily availability of many herbal drugs. The therapeutic potential of various herbal plants have need to be explore for its medicinal use^[2]. Some components of these preparations have biochemical effects other than those of lowering blood glucose and indeed have been used for other medical indications in traditional practice. The primary objective of the study was to determine the effect of the oral mixture of traditional Chinese medicine for diabetes on blood glucose level and the biochemical changes if any, on the liver (ALT, AST, gamma- GT, albumin, globulin) and renal (blood creatinine, urea) functions in normal mice. Many medical plants have served as anticancer pharmaceutical resources, and over 60% of current anticancer drugs such as vinblastine, topotecan, etoposide, were originally plant – derived compounds ^[3, 4]. *Trichosanthes* Species are the largest genus in the cucurbitaceae family, with over 90 species, Fiji and Vanuat. The snake gourd (*Trichosanthes cucumerina* L.) is a popular vegetable in south and Southeast Asian cuisine and cultivated in tropical and subtropical regions around the globe ^[5]. *Trichosanthes Plants Tuber*, an herbal plant of East Asia, prescribed for a diabetic patient, coughing, breast abscesses, and cancer related Symptoms.

In the 1980s, a ribosome – inactivating protein trichosanthin(TCS), was isolated from the tuber of this plant; it has multiple pharmacological properties such as abortifacient, anti –HIV, immunoregulatory, and antitumor functions^[6-8]. By the screening of various numerous herbal plants it was found that the methanol extract of *Trichosanthes Plant* tuber lacking TCS has interesting

bioactivity related to the inhibition of cancer cell growth. In addition, it was demonstrated that the extract of *Trichosanthes Plant* tubers was superior to TCS in antitumor activity^[9]. In the 1980s TCS was isolated from the root tuber and proved to be the active component, a type I ribosome inactivating protein (RIP) with 247 amino acids which inactivates eukaryotic ribosomes via its N – glycosidase activity. TCS has been used to induce mid – term abortion and to treat ectopic pregnancies, hydatidiform and trophoblastic moles in china^[10]. In recent years, TCS has been found to possess various pharmacological properties including immunomodulatory, antitumor and anti – HIV activities^[11-12]. Clinical trials have been performed. TCS has aroused extensive attention. In the present study, we were interested in its anti- tumour activity in vitro. TCS has already been regarded as an effective anti – tumour agent highly specific to choroid carcinoma cells from trophoblasts^[13]. In recent years, screening of anti – tumour drugs from natural resource, especially from traditional Chinese medicines^[14]. It is known as Chinese cucumber in English and gualou belongs to the family cucurbitaceae.

Taxonomical classification:

Kingdom	Plantae
Order	Cucurbitaceae
Family	Cucurbitaceae
Subfamily	Cucurbitoideae
Genus	Trichosanthes L.
Synonyms	Anguina Mill. Cucumeroides Gaertn.

Geographical area:

Trichosanthes is mainly found in the ranges from eastern Himalayas in India and southern china through southern japan, Malaysia, and tropical Australia particularly found in Henan, Shandong, Hebei and Shanxi^[15, 16].

Species of Trichosanthes:

S.No	Species of Trichosanthes
1.	<i>Trichosanthes anguina</i> – Snake Gourd.
2.	<i>Trichosanthes baviensis</i> – Gagnepain.
3.	<i>Trichosanthes cucumerina</i> – Serpent Gourd.
4.	<i>Trichosanthes diocia</i> – Point Gourd.
5.	<i>Trichosanthes dunniana</i> Levl.
6.	<i>Trichosanthes fissibracteata</i> C.Y.Wuex C.Y.Cheng & Yueh.
7.	<i>Trichosanthes globosa</i> Blume.

8.	<i>Trichosanthes homophylla</i> Hayata.
9.	<i>Trichosanthes kerrii</i> Craib.
10.	<i>Trichosanthes kinabaluensis</i> Rugayah.
11.	<i>Trichosanthes kirilowii</i> Gualou.
12.	<i>Trichosanthes laceribractea</i> Hayata.
13.	<i>Trichosanthes lepiniana</i> (Nuad.) Cogn.
14.	<i>Trichosanthes montana</i> Rugayah.
15.	<i>Trichosanthes pedata</i> Merr. & Chun.
16.	<i>Trichosanthes pendula</i> Rugayah.
17.	<i>Trichosanthes pilosa</i> – Japanese Snake Gourd.
18.	<i>Trichosanthes pentaphylla</i> F.Muell.ex Benth.
19.	<i>Trichosanthes postarii</i> W.J.de Wilde & Duyfjes.
20.	<i>Trichosanthes quinquangulata</i> A.Gray.
21.	<i>Trichosanthes reticulineris</i> C.Y.Wu ex S.K.Chen.
22.	<i>Trichosanthes rosthornii</i> Harma – Gualou.
23.	<i>Trichosanthes rubiflos</i> Thorel ex Cayla.
24.	<i>Trichosanthes rugatisemina</i> C.Y.Cheng & Yueh.
25.	<i>Trichosanthes sericeifolia</i> C.Y.Cheng & Yueh.
26.	<i>Trichosanthes subrosea</i> C.Y.Cheng & Yueh.
27.	<i>Trichosanthes tricuspida</i> Lour.
28.	<i>Trichosanthes truncata</i> C.B.Clark.
29.	<i>Trichosanthes villosa</i> Blume.

In addition, several hybrids are known in this genus. Formerly placed in *TRICHOSANTHES* were ^[17]. For example *Kedrostis foetidissima* and *Linnaeosicyos*.

LITERATURE SURVAY:-

***Trichosanthes kirilowii*:** *Trichosanthes kirilowii* is a perianial climber growing to 6 m at a first rate. The flowers are monoecious and are pollinated by insects ^[18]. It is a dioecious liana of the cucurbitaceae family. Investigation and utilization of this plant have increased over the past 30 years, mainly because novel compounds continue to be identified in this plant, including trichosanthin, which has the potential to inhibit human immunodeficiency virus.

***Trichosanthes kerrii*:** - It is obtained from dicotyledonous plants for medicine Cucurbitaceae long fruit *Trichosanthes* fruit. It produced in southeastern Yunnan and Guangxi Southwestern (Long

states). Born in elevation of 700-1900 meters in the jungle valley or brook damp woodland. Distributed in India and Thailand.

Trichosanthes laceribractea: *Trichosanthes laceribractea* is the largest species of *Trichosanthes* in the Cucurbitaceae Family. Its center of diversity in Southeast Asia, but ranges from India through out Asia east to Taiwan, the Philippines and Japan. It is a popular vegetable in South and Southeast Asian cuisine cultivated in tropical and subtropical regions around the globe^[19].

Trichosanthes lepiniana : it is a stem robust, branched, glabrous. Petiole 4 – 7 cm, round shape, glabrous or glandular – punctate; leaf blade adaxially deep green, suborbicular, shortly 3-5-lobed up to middle, adaxially rough; lobe margin denticulate, apex acute or shortly acuminate^[20]. Male raceme 13 – 17 cm; striate, glabrous; pedicels ca. 5 mm; bracts suborbicular, ca. 4 cm, cucullate, margin lacerate; calyx tube attenuate from apex toward base, ca. 7 cm, puberulent; segments narrowly ovate, ca. 1.5 x 0.4 cm margin laciniate.

Trichosanthes montana: It is distributed throughout India and commonly used as a vegetable. The fruits of *Trichosanthes montana* have antioxidant, nutritive and hepatotoxic properties. The roots and seeds are used as anti-diarrheal and also have piperazine like effect^[21]. The fruit is traditionally prepared as a winter soup to ward off colds and influenza.



Fig.1 Fruit of *T. montana*

Trichosanthes pedata : The *Trichosanthes pedata* are mostly prostrate or climbing herbaceous plants. The leaves of *pedata* are alternate and usually palmately 5 – lobed or divided; stipules are absent. The flowers are actinomorphic and nearly always unisexual. The fruit is a type of berry called a pepo^[22]. The plant including roots, leaves, fruits, seeds have medicinal purpose.

Trichosanthes pendula : *Trichosanthes pendula* is a species of an *Trichosanthes* plant : Medicinal Important Plant of Cucurbitaceae family. It mainly acts as a catalogue of life. It is present in roots, is undergoing trials as a possible remedy for AIDS^[23].

In Traditional Chinese medicine it is said to drain heat and generate fluids, clear and drain lung heat, transform phlegm and moisten lung dryness and resolve toxicity and expel pus.



Fig.2 Fruit of *T. pendula*

Trichosanthes pentaphylla: It involves the evaluation of the cytotoxic activity against human cancer cell exhibited cytotoxicity especially against a human renal cancer. The triterpenoids present in the plant are expected to be potential antitumor promoters. *Trichosanthes* also has special green health care function^[24]. Therefore, in recent years, it is valued and demanded.

Trichosanthes pilosa : it is a tropical or semitropical vine bearing an edible fruit. It is native to JAPAN, INDIA, MALAYSIA, VIETNAM, the PHILIPPINES, CHINA and other parts of Southeast Asia as well as in Australia. It is known in English as Japanese Snake Gourd^[25].

The Japanese Snake Gourd (*T.pilosa*), is very similar in its vegetative characters to the more widespread “Snake Gourd”, *Trichosanthes cucumerina*, the flower and leaves of the two species are very similar but the fruit of *T. pilosa* are round to egg – shaped, about 7 cm long and not resembling a Snake^[26].

Trichosanthes postarii : *Trichosanthes postarii* is an also important species of *Trichosanthes* Plant of Cucurbitaceae family. Because it also acts as a catalogue of life^[27]. it ranges from eastern Himalayas in India and southern japan, Malaysia and tropical Australia. In India, it is a large climber. Plants are mainly annual or perennial with weak stem trailing or decumbent vines^[28].

Trichosanthes tricuspidata:- It is known as *T.palmate* roxb ,*T.bracteata* Lamb , *T.pubera* Blume or *Modecca bracteata* , belongs to the family cucurbitaceae. In Hindi it is known as Lal Indrayan ,in English, Redball snakegourd in Malaya, kalayar,in Marathi, Kaundal, in Telugu , Avuduta , in Thai , Khe –KaDaeng and in Nepal Indren.

PHARMACOLOGICAL ACTION:

They are employed in treatment of epilepsy,allopicia,skin diseases and diabetes mellitus. it is used widely for the treatment of cough and various blood diseases and also use for the treatment of Constipation^[29].

The fruit can inhibit staphylococcus aureus, diplococcus pneumonia, haemolytic streptococcus, E. Coli, B. Typhi^[30].it is used for cold – phlegm, damp – phlegm, phlegm accumulated due to food stagnancy, all of which are harmful with no benefit^[31].This plant is used as a laxative, anthelmintic^[32].

CONCLUSION : After the through literature we have found that *TRICHOSANTHES PLANT* have tremendous medicinal properties such as anti – HIV, anxiolytics, anti-diarrhoeal, anti-diarrhoeal, anti-pyretic, carminative, antioxidant, anti-diabetic, anti-bacterial, laxative, anthelmintic, anti-tuberculosis and purgative. It is also employed as an abortifacient, diuretic and cardiogenic agent. They also show strong anti-inflammatory, anti-tussive, cytotoxic and expectorant properties. Apart from biological profile *Trichosanthes* possess many therapeutically important chemical constituents.

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