WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 7.523
Volume 6, Issue 2, 500-511. Review Article ISSN 2277– 7105

A REVIEW ON TRILLIUM GOVANIANUM

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Article Received on
13 Dec. 2016,

Revised on 03 Jan. 2017,
Accepted on 23 Jan. 2017

DOI: 10.20959/wjpr20172-7824

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ABSTRACT

Medicinal plants are capitalized in cure of different ailments since time immemorial in ancient times may plants were used for the prevention, protection and treatment of the diseases. *Trillium govanianum* is one of the best herbal plants with lots of therapeutic value, also known to be called Himalayan *trillium* or *Nagchhatri*, teenpatra, matarzela, triflower, birthroot, belong to family *trilliaceae*/*Melanthiaceae*. Himalayan *trillium* is a robust, trifoliate perennial flowering herb with deep red and greenish colour flowers and mainly found in Himalayas, especially in Nepal, China, as well as Butan. *Trillium* contains important phytoconstituents named as steroid saponins. *Trillium* is considered as an endangered plant species. Any medicinal activity of any plant are due to the presence of their metabolites, as it is considered as an endangered species, steps must be taken to conserve this important medicinal herb. This plant can be fruitful in curing many disorders and mainly used in the treatment of cancer also that's way this plant act as an anticancer herb. So in the present review we aimed to evaluate and investigate the properties, morphology, habitat and biological activities of *Trillium govanianum*, in the system of medicines along with its various species.

KEYWORDS: *Trillium*, Steroidal saponins, herbal medicines, Phytoconstituents, Perennial herb, Himalayas, Govaninum.

INTRODUCTION

Trillium is a genus of perennial flowering herb/ plant native to temperate region of North America and Asia. *Trillium* is a perennial herb, it lies at an altitude of 2700m to 4000m.

Trillium roots consists of *TRILLARIN* which when hydrolyzed give 25% diosgenina- cortico-steroid and this hormone is believed to use in preparing sex hormones, cortisone, allied preparation used in the regulation of menstrual cycle flow and curing various stomach problems. This drug is very much demanded in national as well as international markets due to its high medicinal properties as trillium is an endangered species its conservation should be done.[1] Himalayan herbal plants appear to have been used as well as traded for million years.[2] Now a day's too, the demand for the medicinal and herbal plants has increased very often both at national as well as international trade market.[3-4] Trillium plant is almost 30cm tall in height, having a stout rhizome with lots of adventitious roots. *T.govanianum* rhizome is mainly used to cure dysentery, healing of wounds, sexual disorders etc[5-6]. *Trillium*s have various species, known and important species of this plant are written below. *Trillium albidum,Trillium angustipetalum, Trillium apetalon,Trillium camschatcense,Trillium catesbaei, Trillium cernuum, Trillium channellii,Trillium chloropetalum, Trillium crockerianum, Trillium cuneatum, Trillium decipiens,Trillium decumbens, Trillium discolo*r, *Trillium erectum, Trillium flexipes, Trillium foetidissimum, Trillium govanianum,Trillium gracile, Trillium grandiflorum,Trillium hagae, Trillium komarovii,Trillium kurabayashii, Trillium lancifolium,Trillium ludovicianum, Trillium luteum, Trillium maculatum,Trillium miyabeanum, Trillium nivale, Trillium oostingii, Trillium ovatum, Trillium persistens, Trillium petiolatum, Trillium pusillum, Trillium recurvatum, Trillium reliquum,Trillium rugelii, Trillium sessile, Trillium simile, Trillium smallii, Trillium stamineum, Trillium sulcatum,Trillium taiwanense,Trillium tschonoskii,Trillium underwoodii,Trillium undulatum, Trillium vaseyi,Trillium viride,Trillium viridescens* & *Trillium yezoense.*[7-14]

Dried roots of *trillium* species that are used traditionally for immune regulation and also as an anti-inflammatory and anti-ageing agent and produced anti tumor properties. Cytotoxicity property of roots of various species of *trillium* can be used against liver, lungs, breast carcinoma cells[15-16]. Trillium Genus is rich in steroidal Saponins, e.g Trillium *erectum,*[17-19] *Trillium kamtschaticumpall,*[20-22] *Trillium tschonoskiimaxim*[23-26][22][16].

Fig-1: *Trillium albidum.*[27-29]

Common Names: Giant white wakerobin, white toadshade & sweet trillium

Native Place: Northwestern United States (From Washington to central California)

Habitat: It occur mostly in the forest area, woodlands and in chaparral habitat.

Morphology of Plant: Perennial herb, consists three large leaves with one pink or purple-white tinged fragrant flower.

BIODIVERSITY-: *Trillium albidum*, known by the common names giant white wakerobin,[30] white to adshade, and sweet trillium, is a species of flowering plant native to the northwestern United States from Washington to central California. It occurs in forests, woodlands, scrub, andchaparral habitat, becoming common in some areas.[31-33]*Trillium albidum* is a rhizomatous perennial herb with one or more erect stems growing 20 to 70 centimetres (7.9 to 27.6 in) ers in height. There is a whorl of three large leaves generally described as bracts,[34] each measuring up to 20 centimeters in length. They are green and mottled with brownish or darker green spots. Each stem produces one flower, which is held on top of the bracts. The fragrant flower has three lance-shaped green sepals and three wider white or pink- or purple-tinged petals measuring up to 11 centimetres (4.3 in) long.

Fig-2: *Trillium angustipetalum*[35-38]

Comman name: Narrow petal wakerobin

Family: Melanthiaceae

Morphology of Plant: Rhizomatous perennial herb having a whorl of three large leaves with one purple or maroon colored ill scented flower.

BIODIVERSITY-: *Trillium angustipetalum* is a species of *Trillium*, plants which may be included within the lily family or the newer family Melanthiaceae.[39] Its common name is narrowpetal wakerobin[40].It is native to northern and central California and southwestern Oregon, where it occurs in forests, woodlands, chaparral, and riparian zones.[41-42]. *Trillium angustipetalum* is a rhizomatous perennial herb with one or more erect stems growing up to 70 centimetres (28 in) in height. There is a whorl of three large leaves generally described as bracts each measuring up to 25 centimetres (9.8 in) in length and round or somewhat oval. They are green and mottled with brownish or darker green spots. Each stem produces one flower, which is held on top of the bracts. The ill-scented flower has three lance-shaped green or red sepals and three narrow purple or maroon petals measuring up to 11 centimetres (4.3 in) long.[43]

Fig-3: *Trillium camschatcense.*[44-45]

Other Names or Synonyms: Trillium kamtschaticum, Trillium pallasii.

Familiy: Melanthiaceae

Native Place: East Asia, Grows in Japan (Hokkaido & Northern Honshu), Korea, China (Jilin Province), and Eastern Russia (Kamchatka, Kuril, Sakhalin, Primorye & Khabarovsk)

Morphology of Plant: Perennial herb bearing white colored flowers.

Fig-4: *Trillium catesbaei*[46-49]

Synonyms: Trillium nervosum, Trillium stylosum, Delostylis cernuum, Delostylis stylosum, Trillium balduinianum, Trillium declinatum, Trillium affine

Common Names: Bashful wakerobin & Rosy wake-robin

Family: Melanthiaceae

Native Place: Southeastern United States

Cultivation Conditions: Cultivated in Moist, humus-rich soil in shade

Morphology: Perennial herb spreaded by means of Rhizomes, have white, pink or rose-colored flowers

Fig-5: *Trillium cernuum*[50-51]

Synonyms: Trillium glaucum, Trillium hamosum, Trillium latifolium & Trillium medium

Common Names: Nodding Trillium, Nodding Wakerobin & Whip-poor-will flower

Native Place: North eastern North America

Cultivation Conditions: Cultivated in moist, humus-rich soil.

Morphology: Perennial herbaceous plant, having white colored flower with a shiny red fruit

Fig-6: *Trillium channellii*[52]

Family: Melanthiaceae

Native Place: Hokkaido in Northern Japan

Note: This plant is named in the honour of Robert.B Channell of Vanderbilt University in Nashville, USA & plant is listed as endangered by the National museum of Nature & science (Tokyo).

Morphology: Perennial Herb,spread by means of underground rhizomes having leaves broadly elliptic, wide & long with white flowers.

Fig-7: *Trillium chloropetalum*[53]

Synonyms: Trillium giganteum,Trillium sessile

Common Names: Common Trillium,Giant Trillium,Giant Wake Robin & Sessile Trillium

Family: Melanthiaceae

Native Place: California (Siskiyou County, Santa Barbara & Madera Counties)

Morphology: Spring flowering perennial plant bearing maroon colored flowers.

BIODEVERSITY-Trillium chloropetalum is a California species of spring-flowering perennial plants.[54].Common names: giant wakerobin,[55] common trillium, giant trillium, and sessile trillium. It is found in the Coast Ranges and in the Sierra Nevada foothills from Siskiyou County to Santa Barbara and Madera Counties.[56-57]Color is variable, often dark red to white. Leaves and flowers that are grouped in threes. It is clump-forming and prefers a shady habitat, since its natural habitat is the woodland floor[58].

Fig-8:*Trillium govanianum*[59-60].

Family: Melanthiaceae (Bunchflower Family)

Synonyms: Trillidium govanianum

Common Names: Himalayan Trillium

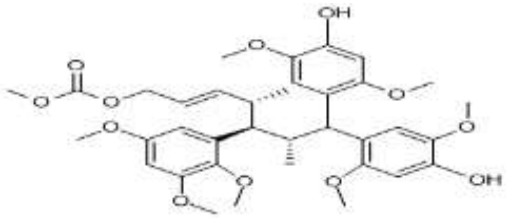
Native Place: Found in Himalayas, Nepal, Bhutan & China

Morphology: Perennial herb having purple-red stem which carries a single, small, starry deep red or green colored flower located over three green leaves.

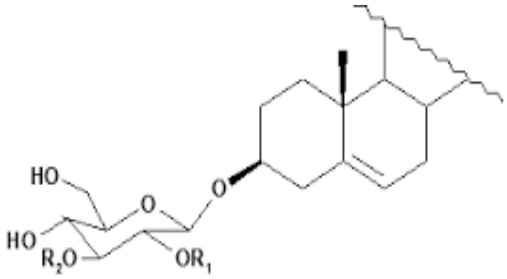
BIODERVISITY-Trillidium govanianum (Wall. ex D. Don) Kunth is a native species of the Himalayan region.[61-62]and distributed in the Himalaya, Bhutan, Nepal and China between

the elevation range of 2,500 to 4,000 m. It belongs to Trillidiaceae family.[63-64]and locally known as Nagchhatri in Kullu area of Himachal Pradesh. It can be identified by its three leaves in one whorl at the summit of the stem and a solitary, purple flower in the centre. Leaves are broadly ovate, acute and conspicuously stalked. Flowers are brown purple with narrow petals[65-66].Kullu district is one of the twelve districts of Himachal Pradesh in India, and is known for natural, unique and economically important biodiversity. It is situated between 31° 58′ 00″N latitudes and 77° 06′ 04″E longitudes and covers 5,503 km2 geographical area. Altitude ranges from 900 to 6000 m above mean sea level. The district stretches from Rampur in the South to the Rohtang Pass in the North and is bounded on the North and East by Lahaul-Spiti, South-East by Kinnaur, South by Shimla, South-West and West by Mandi and North-West by Kangra districts of the State It represents the biodiversity of Great Himalayan National Park and Kais, Kanawar, Khokhan, Manali, Sainj and Tirthan Wildlife Sanctuaries. The district has rich medicinal plants diversity and about 500 species of medicinal plants.[67]

Trillium tschonoskii.[68] Identified as a Steroidal Saponin. 10 compounds were isolated from Trillium tschonoskii and their structures had been identified by 2D-NMR studies. This includes 2 sterols, 6 spirostanols and 2furostanols. Species are used to suppress the growth of colorectal cancer cells and multi drug resistance of hepatocellular carcinoma.



(2, 3-S Trans, 10R, 6E)-7, 11-Dimethyl-3-Methylene-1, 6-dodecadien-10,11-diol-10-O-β-D-glucopyranosyl(1,4)- O-β-D-glucopyranosyl- l(1,4)- O-β-D-glucopyranoside



(23S, 24S, 25S)-spirost-5-en-1β, 3β, 21, 23, 24-pentaol-1-O-β-D-Xylopyranosyl-(1-3)-{O-α-L-rahmnopyranosyl-(1-2)}O-α-L-arabinopyranoside

CONCLUSION

Trillium is a very adventitious plant. It is herbal as well as medicinal in nature. Its various parts can be used for the treatment of diarrhea and dysentery, each and every part like (leaves and roots) possesses medicinal property, so it is not at all wrong to say that trillium is a magical herb with lots of properties. It is very ornamental and long lived plant act as antiseptic, antitumor, anti-spasmodic, and diuretic as well as ophthalmic. Various species of *trillium* like *erectum* and *trillium* tschonoskii has cytotoxic activity. So, it is possible that other plants of this specie may possesses same activity. This plant is really a boon to medicinal field, due to this reason this plant and its other species can be studied further for various other activities. The primary and important therapeutic use of *trillium* that is to stop bleeding or hemorrhages. So present study will help in the conservation as well as future study of this plant, as there is a long way to go to know more about this important and precious medicinal as well as herbal plant.

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