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Trillium govanianum: A Boon to Medicinal World

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ABSTRACT

Herbal plants are used and preserved in curing different diseases since ancient times. These herbal plants were used for the prevention and protection of various diseases. *Trillium govanianum* is one of the magical herbal plants with lots of medicinal value and also known as Himalaya Trillium or Nag Chhatri, Teen Patra, tri flower or birthroot belonging to family Trilliaceae. Himalayan trillium is a trifoliolate perennial herb with deep red and greenish colour flowers and it is mainly found in Himalayas. Mainly in China, Nepal, Butan. Trillium mainly contains steroids saponin. Trillium medicinal activity is due to the presence of various important phytoconstituents and metabolites. This plant is very useful in curing many disorders but mainly used in the treatment of cancer. So it is also known as anticancer herb. As Trillium is an endangered species hence its preservation should be done. So in the present review we study and investigate about the biological activities of *T. govanianum* with its different species. *T. govanianum* conservation and preservation is necessary as it is very important herb in curing different types of illnesses. This can be cured by using this magical herb. *T. govanianum* proves to be the most important herb in the system of medicines as this plant possesses lot of therapeutic value.

Keywords: *Trillium*, Steroidal saponins, Herbal medicines, Phytoconstituents, Perennial herb, Himalayas, Govaninum

INTRODUCTION

Trillium is a perennial flowering herb native to the temperate region of North America and Asia. *Trillium* is a medicinal herb presented at an altitude of 2700 m-4000 m. *Trillium* roots when hydrolyzed give a hormone known as diosgenina-cortico-steroid which is used in the preparation of sex hormone and stomach problem. Its some extracts used in the regulation of menstrual flow. This herbal plant is very much in demand due to its various medicinal properties [1]. *Trillium* plant was high in use as well as traded in national and international market for millions of years [2]. At present the demand of this plant has increased for more and more use in trade market [3,4]. *Trillium* plant is 30 cm in height, with rhizome and adventitious root. *Trillium* rhizome is most often used to care sexual disorders, Dysentery etc. [5,6]. Genus *Trillium* has lots and lots of species. Various 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 discolor*, *Trillium erectum*, *Trillium flexipes*, *Trillium foetidissimum*, *Trillium govanianum*, *Trillium gracile*, *Trillium grandiflorum*, *Trillium hague*, *Trillium komarovii*, *Trillium kurabayashii*, *Trillium lancifolium*, *Trillium ludovicianum*, *Trillium luteum*, *Trillium maculatum*, *Trillium miyabeianum*, *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* and *Trillium yezoense* [7-14]. Roots when dried of this plant species can be used for immune regulation and also act as anti-inflammatory as well as antiageing property. *Trillium* roots possess cytotoxicity property which can use widely against lungs breast carcinoma and liver diseases [15,16]. *Trillium* is rich in steroidal saponins as discussed previously e.g., *T. erectum* [17-19], *T. kamtschaticumpall* [20-22], *T. tschonoskiimaxim* [16,22-26].

Common names: Giant white wakerobin, white toadshade and sweet *Trillium*. **Native place:** Northwestern United States (From Washington to central California). **Habitat:** It occurs 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 (Figure 1) [25,27,28].



Figure 1: *Trillium albidum*

Biodiversity

T. albidum, called by various common names like white wakerobin [29], white to adshade and sweet *Trillium*, This species is a flowering plant mainly native to North-western United States from Washington to central California. It mainly seen in dense forests, woodlands, scrub and habitat, but common in some places [30-32]. *T. albidum* is a perennial herb with rhizomes. The stems are erect and can grow up to 20-70 cm. It is mostly like 3 large leaves generally called as bracts [33], each bract grow up to 20 cm in length. These bracts are green with brownish or dark green spots. The stem of this plant produce one flower mostly which are on the top of bracts. The flowers are fragrant in nature with 3 lance shaped green sepals with 3 wider pink or white petals which measure about 11 cm.



Figure 2: *Trillium camschatcense*

Other names or synonyms: T. kamtschaticum, T. pallasii. Family: Melanthiaceae. Native place: East Asia, Grows in Japan (Hokkaido and Northern Honshu), Korea, China (Jilin Province) and Eastern Russia (Kamchatka, Kuril, Sakhalin, Primorye and Khabarovsk). Morphology of plant: Perennial herb bearing white colored flowers (Figure 2) [34,35].



Figure 3: *Trillium channellii*

*Family: Melanthiaceae. Native Place: Hokkaido in Northern Japan. Note: In the honor of Robert. Daniel B. Channell, of Vanderbilt University in Nashville, USA. This plant *T. channellii* named. This plant is endangered and listed by the National museum of Nature & science (Tokyo). Morphology: This plant is mainly a perennial herb grows by the means of is underground rhizome. This plant possessive broad leaves elliptic wide and long having white flowers (Figure 3) [36].*

Synonyms: T. giganteum, T. sessile, Common names: Common Trillium, Giant Trillium, Giant Wake Robin and Sessile Trillium. Family: Melanthiaceae. Native place: California (Siskiyou County, Santa Barbara & Madera Counties). Morphology: Spring flowering perennial plant bearing maroon colored flowers (Figure 4) [37].



Figure 4: *Trillium chloropetalum*

Biodiversity

Trillium chloropetalum is a spring perennial plants and it is a California species [38]. It is Common called with various names like giant wakerobin [39], It is nearly presented in the coast ranges and in the Sierra Nevada foothills from Siskiyou Country to Santa Barbara and Madera Countries [40,41]. Color is variable in nature mostly dark red to white. Leaves as well as flowers are grouped in three. It shows shady habitat since its own nature habitat is in the woodland floor [41].



Figure 5: *Trillium decipiens*

Synonyms: Deceiving *Trillium*. *Family:* Melanthiaceae, *Native place:* Albama, Florida and Georgia. It is mostly found near the Chattahoochee River. *Morphology:* Perennial herb having purple, brown, green and rarely yellow flowers (Figure 5) [42,43].

Biodiversity

Trillium decipiens, also known as Chattahoochee River wakerobin [44] and deceiving *Trillium*, is a spring-flowering perennial plant. It occurs mostly near the Chattahoochee River [45] in Alabama, Florida and Georgia. Scattered populations are found elsewhere in these three states, all within the Atlantic Coastal Plain or Gulf Coastal Plain. Rich deciduous woods of bluffs, ravines, and alluvial land provide its most favored habitat. Its stemless flower has three purple, brown or green (rarely yellow) petals which stand upright at the junction of the three strikingly mottled leaves. It is one of the earliest trilliums, often starting to bloom in January or February.



Figure 6: *Trillium decumbens*

Common names: Trailing Wakerobin & Trailing *Trillium*. *Family:* Melanthiaceae. *Native place:* Albama, Northern Georgia & Southeastern Tennessee. *Morphology:* It is a perennial herb having mottled green & bronze, overlaid with silver, dying back leaves with dark maroon or purple flower having a dark purple fruit (Figure 6) [46-48].

Biodiversity

T. decumbens, the trailing wakerobin [49] or trailing *Trillium*, is a perennial wildflower which blooms from mid-March to April. Unlike most other trilliums, its stems grow along the ground rather than standing upright, so that the plant appears to rest on the ground. Its leaves are mottled green and bronze, overlaid with silver, dying back early in the season. The flowers are dark maroon or purple. After flowering, it bears a dark purple berry.



Figure 7: *Trillium discolor*

Family: Melanthiaceae. *Synonyms*: *T. sessile*, *T. luteum*. *Common names*: Faded *Trillium* and Small yellow Toadshade, *Native place*: Georgia, North Carolina & South Carolina. *Morphology*: Perennial herb having pale yellow flower which stands upright at the junction of three leaves (Figure 7) [50,51].



Figure 8: *Trillium erectum*

Note: *T. erectum* has gained the 'Royal Horticultural Society's Award of Garden Merit'. *Family*: Melanthiaceae. *Synonyms*: Wake-Robin, Red *Trillium*, Purple *Trillium*, Beth Root & Stinking Benjamin. *Native place*: East & North East of North America. *Morphology*: Herbaceous perennial herb having three pointed leaves with deep red colored flowers though there is a white form of flowers also (Figure 8) [52-54].

Biodiversity

T. erectum, also known as red *Trillium* [55], wake-robin, purple *Trillium* [56], Beth root, or stinking Benjamin [52], is a species of flowering plant native to the east and north-east of North America. It is a spring ephemeral, an herbaceous perennial whose life-cycle is synchronized with that of the deciduous forests where it lives. This plant grows to about 40 cm (16 in) in height with a spread of 30 cm (12 in), and can tolerate extreme cold in winter, surviving temperatures down to -35°C (-31°F). Like all *Trilliums*, its parts are in groups of three, with 3-petalled flowers above whorls of pointed triple leaves [57]. The leaves contain calcium oxalate crystals and crystal raphide, and should not be consumed by humans. The flowers are a deep red colour, though there is a white form. The flowers have the smell of rotting meat, as they are pollinated by flies. The plant takes its name "wake-robin" by analogy with the robin, which has a red breast heralding spring. This plant has gained the Royal Horticultural Society's Award of Garden Merit [58].



Figure 9: *Trillium flexipes*

Family: Melanthiaceae. *Synonyms:* *Trillium gleasonii* and *Trillium declinatum*. *Common names:* Bent *Trillium* & Drooping *Trillium*. *Native place:* Found Commonly in Midwestern United States, Eastern parts of Philadelphia & Southern parts of Alabama. *Morphology:* Spring flowering perennial herb the species have variable morphology. In Northern areas the flower hangs below the leaves but in southern areas the plant have large erect flower (Figure 9) [59-63].

Biodiversity

T. flexipes, the nodding wakerobin [64], bent trillium, or drooping *Trillium*, is a spring-flowering perennial that is most common in the Midwestern United States. Scattered populations are found as far east as Philadelphia and as far south as Alabama, as well as in the Canadian Province of Ontario. However, it is an endangered plant species in Canada and is rare throughout its Canadian range [59], so that it is protected by law in Ontario [65]. This species is variable, and tends to hang its flower below the leaves in northern areas. Southern strains have a large erect flower. The red or purplish fruit is also showy [66].



Figure 10: *Trillium foetidissimum*

Family: Melanthiaceae. *Common names:* Fetid *Trillium*, Mississippi River Wakerobin. *Native place:* Louisiana-Mississippi border. *Morphology:* Brown colored plant with horizontal rhizomes and bracts having bronze green colored leaves with maroon colored flowers. The plant bears purple-brown colored berries. This plant emits a smell of rotting meat to attract insect pollinators (Figure 10) [67-70].

Biodiversity

The plant is brown colored with horizontal rhizomes and bracts. It carries 1-2 scapes which are 0.8-2.8 decimeters (3.1-11.0 in) from green to maroon colored and are round at cross section. Leaves are either light or bronze-green in color. Sepals are located above the bracts and are green colored, horizontal, and lanceolate. They are 16-40 mm (0.63-1.57 in) long and 4-6 mm (0.16-0.24 in) wide and are thick. Petals are erect while apex is acute. Filaments are 3-6 mm (0.12-0.24 in) long and is dark maroon in color while stamens are 9-25 mm (0.35-0.98 in) and are both erect and prominent. Anthers are straight, 8-15 mm (0.31-0.59 in) long and is blackish-maroon in color. The species also have erect and ovate ovary which is 5-12 mm (0.20-0.47 in) long and is reddish-purple in color. Stigma is also erect and dark purple in color but is subulate and fleshy unlike the ovary. The flower is sessile, of a maroon color fading to brown with narrow lanceolate petals. It emits a smell of rotting meat to attract insect pollinators, hence the name. Its leaves are strongly mottled. The flower turns to a purple-brown berry in autumn [71].



Figure 11: *Trillium govanianum*

Family: Melanthiaceae (Bunch flower family). *Synonyms:* *T. govanianum*. *Common names:* Himalayan *Trillium*. *Native place:* Found in Himalayas, Nepal, Bhutan & China. *Morphology:* It is mainly a perennial herb with purple to red stem. Its flowers are small deep red single located over the three green leaves (Figure 11) [72-74].

Biodiversity

Trillidium govanianum (Wall. ex D. Don) Kunth is mainly a native of Himalayan region [75,76]. It is widely distributed in Butan Nepal Himalayas as well as China with an elevation range of 2500-400 m. This plant belongs Trilliaceae family [77,78] and it is locally known to be Nag Chhatri in the areas of Himachal Pradesh.

These plants possess three leaves in or whorl at stem and are solitary, there are purple flowers in the center. Leaves of this plant are broad ovate and conspicuously stalked. Brown purple flowers with narrow petals are seen [79,80]. As Kullu district is one of the most popular districts of Himachal Pradesh and this place is known for its natural 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. Its Altitude is from 900-6000 m above sea level. The district of Kinnaur, Shimla, Mandi, Kangra represents the great biodiversity of Himalayan National Park and Kais, Kanawar, Khokhan, Manali, Sainj and Tirthan Wildlife Sanctuaries. The district here has high medicinal plants diversity with about 500 species of medicinal herb [81].



Figure 12: *Trillium gracile*

Family: Melanthiaceae. *Synonyms:* *T. gracile* luteum. *Common names:* Sabine River Wakerobin, Slender *Trillium* & Graceful *Trillium*. *Native place:* Plant found at the banks of Sabine River in Western Louisiana & Eastern Texas. It generally grows in mature pine and hardwood forests & on riverbanks. *Morphology:* Perennial herb spreading through underground rhizomes. Plant bears a purple colored flower having musty-like fragrance (Figure 12) [82-88].



Figure 13: *Trillium grandiflorum*

Family: Melanthiaceae. *Common names:* White *Trillium*, Large flowered *Trillium*, Great white *Trillium*, White wakerobin & French trille blanc. *Native place:* Eastern North America, From Northern Quebec to the Southern parts of the United States through Appalachian Mountains into Northernmost Georgia & West to Minnesota. It is also found in Vancouver Islands in British Columbia. *Morphology:* Herbaceous Perennial plant having an attractive three petaled white flower (Figure 13) [89-95].



Figure 14: *Trillium lancifolium*

Family: Melanthiaceae. *Synonyms:* *T. lanceolatum* and *T. recurvatum*. *Common names:* Lance-leaved or narrow leaved *Trillium*. *Native place:* Southeastern United States, the plant is known to occur in Alabama, Florida, Georgia, South Carolina. *Morphology:* This is the smallest plant comparative to other species of the genus *Trillium* having narrow lanceolate leaves with maroon or brownish-maroon colored flowers.

Note: This specie is kept under endangered plants category in Florida & Tennessee because of its rarity but despite of its rarity it is commonly found at 'Steven's Creek Heritage Preserve' (Figure 14) [96-99].



Figure 15: *Trillium ludovicianum*

Family: Melanthiaceae. *Common names:* Louisiana wakerobin & Louisiana *Trillium*. *Native place:* South Central United States (Louisiana, Mississippi & Eastern Texas). *Morphology:* Perennial Herb bearing dark red, purple or dark green flowers (Figure 15) [55,100-103].



Figure 16: *Trillium luteum*

Family: Melanthiaceae. *Common names:* Yellow wakerobin and Yellow *Trillium*. *Native place:* Commonly found in Great Smoky Mountains of United States of America and surrounding areas. It also occurs in some parts of Tennessee, Georgia, North Carolina and Kentucky. *Morphology:* Herbaceous perennial flowering plant having variegated leaves with yellow, lemon scented flowers. *Note:* This plant has got “Royal Horticultural Society’s Award of Garden Merit” (Figure 16) [104-109].



Figure 17: *Trillium maculatum*

Family: Melanthiaceae. *Synonyms:* *T. maculatum* luteum and *T. maculatum* simulans. *Common names:* Spotted *Trillium*. *Native place:* Southeastern United States (Alabama, Georgia, South Carolina and Northern Florida). *Morphology:* Plant has irregular dark splotches on leaves and stems with deep-red or reddish purple but occasionally yellow flowers (Figure 17) [110-114].

Family: Melanthiaceae. *Common names:* Snow *Trillium* or Dwarf white *Trillium*. *Native place:* East and Midwest United States, the great lake states, the Ohio River Valley and the Upper Mississippi Valley. *Morphology:* Plant is smaller than many other species (Figure 18) [115-119].



Figure 18: *Trillium nivale*



Figure 19: *Trillium oostingii*

Family: Melanthiaceae. *Common names:* Wateree *Trillium*. *Native place:* Central Part of the US State of South Carolina. *Morphology:* Perennial flowering plant having three broadly rounded mottled leaves and its flowers have three green-yellow petals & three green to maroon sepals (Figure 19) [114,120,121].



Figure 20: *Trillium ovatum*

Family: Melanthiaceae. *Common names:* Western wakerobin, Pacific *Trillium* and Western white *Trillium*. *Native place:* Western United States, Western Canada, Southern British Columbia and Extreme Southern Alberta, Washington, Oregon and East to Montana, Wyoming and Northern Colorado. Near California shore this plant is common under Coast Redwood. *Morphology:* Perennial herb spreading by means of underground rhizomes. Plant bears white or pink colored flowers (Figure 20) [123-125].

Biodiversity

Western *Trillium* is a native forb found in moist woods, stream banks, shaded open areas at low to middle elevations [126,127]. It is nitrophytic and prefers fresh and very moist, uncompacted forest floors. It is also characteristic of cool mesothermal climates and Moder and Mull humus forms. Western *trillium* is a good indicator of healthy forests and its associate plant species include vanilla leaf (*Achyrocline triphylla*), sweet-scented bedstraw (*Galium triflorum*), sword fern (*Polystichum munitum*), clasping twistedstalk (*Streptopus amplexifolius*) and foamflower (*Tiarella trifoliata*) [128]. These are all understory vegetation that grows in healthy forests.

Family: Melanthiaceae. *Common names:* Persistent *Trillium* and Persistent wakerobin. *Native place:* Found in limited ranges in parts of United States at Northeastern Georgia and Northwestern South Carolina. *Morphology:* The plant comes under endangered herbaceous perennial herb having three broad & lanceolate leaves at the top of the stem. The plant bears a white colored flower (Figure 21) [129-133].



Figure 21: *Trillium persistens*



Figure 22: *Trillium petiolatum*

Family: Melanthiaceae. *Synonyms:* *Trillium petiolatum* luteum. *Common names:* Round Leaf *Trillium*, Idaho *Trillium*. *Native place:* Northwestern Western United States, The state of Idaho, Oregon and Washington. *Morphology:* This specie has round petiolate leaves and dark maroon to purple colored flowers which are close to the ground. It prefers to grow in acidic soil (Figure 22) [134-138].



Figure 23: *Trillium pusillum*

Family: Melanthiaceae. *Common names:* Little *Trillium* and Dwarf wakerobin. *Native place:* Southeastern and South-central United States from Oklahoma to Maryland. *Morphology:* Perennial herb having thin branching, horizontal rhizomes. Flowers have three green to red tinged sepals and white wavy edged petals which turns into pink with time (Figure 23) [139-143].



Figure 24: *Trillium recurvatum*

Family: Melanthiaceae. *Synonyms:* *P. recurvatum* and *T. unguiculatum*. *Common names:* Bloody butcher, Prairie *Trillium*. *Native place:* Central and Eastern United States from Iowa South to Texas and East to North Carolina and Pennsylvania. *Morphology:* *T. recurvatum* has brown to maroon colored flowers whose petals are recurved. The fruit has six well developed ridges & has a seed that contains elaiosomes to promote to promote dispersal by ants and other foraging insects. *Note:* In Michigan the plant is considered as a state threatened species and is protected by law (Figure 24) [144-147].



Figure 25: *Trillium reliquum*

Family: Melanthiaceae. *Common names:* Relict *Trillium*, Confederate *Trillium* and Confederate wakerobin. *Native place:* Found only in Southeastern region of United States: Southwest, central and east central Alabama, Georgia, South Carolina and Tennessee. *Morphology:* Perennial herbaceous flowering plant having three blue-green, to green to silver leaves. Plant bears greenish to brownish purple and sometimes even pale yellow flower. *Note:* *T. reliquum* is officially listed as an endangered species on 4th April 1988 (Figure 25) [148-154].



Figure 26: *Trillium rugelii*

Family: Melanthiaceae. *Common names:* Southern Nodding *Trillium*. *Native place:* Southeastern United States. It is found in the Great Smoky Mountains, Fernbank Forest, Steven's Creek Heritage Preserve and other places of the Piedmont and Southern Appalachian Mountains in Alabama, Georgia, South Carolina, North Carolina and Tennessee. *Morphology:* It is a spring flowering perennial plant who hangs its flower below the leaves (Figure 26) [155-159].



Figure 27: *Trillium sessile*

Family: Melanthiaceae. *Common names:* Toadshade and Sessile-flowered wake-robin. *Native place:* Central part of the Eastern United States and the Ozarks. *Morphology:* Perennial spring wildflower plant having a single foul smelling, stalk less, maroon colored flower which is postured in closed position nestled in the middle of its three leaves (Figure 27) [160-167]. *Note:* (i) This plant name has derived from Latin term *Sessilis* which means low sitting which refers to its stalk less flower. (ii) This plant is listed as a State threatened in Michigan and State endangered in New York.

Family: Melanthiaceae. *Common names:* Jeweled wakerobin, Sweet white wake-robin, Sweet white *Trillium* and Confusing *Trillium*. *Native place:* Southern parts of Appalachian Mountains in Southeastern United States (Georgia, Tennessee, North & South Carolina). *Morphology:* Spring flowering perennial plant having white colored flowers (Figure 28) [168-172].



Figure 28: *Trillium simile*



Figure 29: *Trillium smallii*

Family: Melanthiaceae. *Native place:* Northern Japan and Sakhalin Island. *Morphology:* Perennial herbaceous rhizomatous plant bearing purple colored flowers & ovoid berries as fruit (Figure 29) [173-175].



Figure 30: *Trillium stamineum*

Family: Melanthiaceae. *Synonyms:* Red *Trillium* and Propeller *Trillium*. *Native place:* Found in Southeastern United States (Alabama, Mississippi and Tennessee). *Morphology:* It is an herbaceous plant having whorled, marbled and simple leaves and bears dark red flowers (Figure 30) [95,176-179].

Family: Melanthiaceae. *Common names:* Southern Red *Trillium*, Barksdale *Trillium* and Furrowed wakerobin. *Native place:* Southern Appalachian Mountains and nearby areas from West Virginia to Alabama. *Morphology:* Perennial wildflower plant having pedicellate leaves and bears dark reddish flowers (Figure 31) [180-184].

Family: Melanthiaceae. *Native place:* Himalaya, China, Korea, Taiwan, Japan and South Sakhalin Islands. *Morphology:* Perennial rhizomatous herb bearing white flowers with rhomboid-oval acuminate leaves having a green or purple berry as fruit (Figure 32) [185-187].

Family: Melanthiaceae. *Synonyms:* *T. rectistamineum*. *Native place:* Southeastern United States (Alabama, Georgia and Northern Florida). *Morphology:* Perennial herb spreading by means of rhizomes. Plant has 2-tone leaves with light and dark splotches and bears foul-smelling, usually deep maroon or purplish red but occasionally red flowers (Figure 33) [188-190].



Figure 31: *Trillium sulcatum*



Figure 32: *Trillium tschonoskii*



Figure 33: *Trillium underwoodii*



Figure 34: *Trillium undulatum*

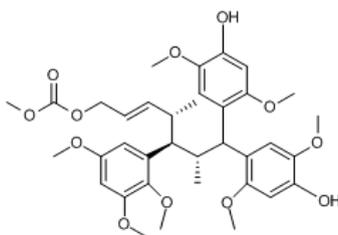
Family: Melanthiaceae. *Synonyms:* *Trillium erythrocarpum*, *Trillium pictum* and *T. cleavelandicum*. *Common names:* Painted Lady or Trille ondule. *Native place:* Ontario in the North to Northern Georgia in the south and from Michigan in the west to Nova Scotia in the east. *Morphology:* Plant has white colored flowers (Figure 34) [190-195].

Family: Melanthiaceae. *Common names:* Sweet wakerobin and Sweet Beth. *Native place:* Southeastern United States (Mainly in Southern Parts of Appalachian Mountains). *Morphology:* Spring flowering perennial plant bearing red colored flowers (Figure 35) [196-199].

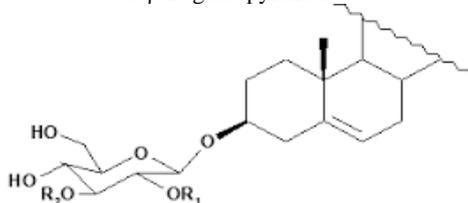
Family: Melanthiaceae. *Native place:* Central United States (States of Missouri and Illinois). *Morphology:* Perennial herb having green colored or sometimes purple colored flowers (Figure 36).

Figure 35: *Trillium vaseyi*Figure 36: *Trillium viride*

T. erectum, there are 6 steroidal glycosides along with 14 known compounds are already identified of this specie. The 2D NMR data is available of first 6 compounds. Species are evaluated for cytotoxic activity. *T. tschonoskii*, this is rich in Steroidal Saponin. There are 10 main components which were isolated from *T. tschonoskii* and their structures had been identified by 2D-NMR studies. This mainly includes 2 sterols, 6 spirostanols and 2 furostanols. 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- 1(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-rahmnoypyranosyl-(1-2)}O-α-L-arabinopyranoside

CONCLUSION

Trillium is a magical herb. It is adventitious and herbal in nature. Its different part is used in caring various diseases and disorders like diarrhea and dysentery. This plant parts like leaves and roots are full of medicinal nature. It is known to be long lived plant and highly ornamental in nature. It possesses properties like antiseptic, antitumor, antispasmodic and diuretic. Various species of genus *Trillium* possesses cytotoxic activity. These plants also possess ophthalmic property. This plant is really a magical plant to medicinal field. Due to its various activities discussed above. The present investigation will help for the future use of plant. As this plant act as a boon and is very important and precious medicinal herb which can go a long way as it is highly fruit full herb in nature.

SUMMARY

Medicinal plant is very important in nature. These plants are used in prevention protection and treatment the disease. *T. govianum* is one of the best herbal plants with lots of therapeutic values. This plant is mostly present in Himalayas. *Trillium* contains important phytoconstituents named as Steroid Saponin. As it is an endangered species so its conservation must be necessarily. This plant possesses lot of adventurous roots. These plants possess activity like anticancer, Anti-inflammatory, Antiageing and Antitumor properties. These genera have lot of species and each species have their own importance. So the conservation as well as preservation as this plant is highly necessary.

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