National Journal of Pharmaceutical Sciences

E-ISSN: 2788-9270
P-ISSN: 2788-9262
www.pharmajournal.net
NJPS 2023; 3(1): 50-54
Received: 03-01-2023
Accepted: 05-02-2023

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Preapred *Thuja occidentalis* glycerol with quality assessment done by UV- VIS Spectrophotometer and FTIR

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DOI: https://doi.org/10.22271/27889262.2023.v3.i1a.69

Abstract
Background: Through this research study preparing the Homoeopathic Medicated glycerol by *Thuja occidentalis*- Q in glycerol base with different ratio i.e (1:1) (1:4) (1:9) under the quality assessment with UV- Visible spectrophotometer and FTIR (Fourier Transform infrared spectroscopy)
Methodology: Preparation of glycerol done in *Thuja occidentalis* Q in the proportion of (1:1) i.e.) 1 part is *Thuja occidentalis* Q and 1 part is Glycerol, (1:4) i.e 1 part is *Thuja occidentalis* Q and 4 part is Glycerol, (1:9) 1 part is *Thuja occidentalis* Q and 9 part is Glycerol. After preparing this from each group (3-4) ml samples were taken in a sterile cuvette placed inside the UV- VIS Chamber to pass it under UV- VIS and also placed one drop from each group of sample over the lens in FTIR to evaluate the maximum transmission.
Results: The Maximum absorbance of *Thuja occidentalis* Q is 0.851 at 607 nm, *Thuja occidentalis* glycerol (1:9) is 0.231 at 536 nm, *Thuja occidentalis* glycerol (1:1) is 0.738 at 609 nm, *Thuja occidentalis* glycerol (1:4) is 0.400 at 610 nm.
Conclusion: Prepared glycerol with homoeopathic mother tincture i.e. *Thuja occidentalis* which gives an excellent results on certain skin diseases like warts, corns, herpetic eruptions, eczema, psoriasis, scalp irritation.

Keywords: *Thuja occidentalis* Q, Glycerol, Absorbance, FTIR, UV- VIS

Introduction
Glycerol (1, 2, 3-propanetriol or glycerine), a characteristic molecule segregated by warming fats inside seeing trash (to deliver cleaning agent) when 2800 BC [1], is a cutting edge substance with numerous applications (Fig. 1). Since the last piece of the 1940s, and following the disclosure of made surfactants, glycerol has been made from epichlorohydrin obtained from propylene (and in this manner from fossil oil) as colossal substance associations decided a glycerol need and began its fabricated production [2]. Today, regardless, glycerol plants are closing and others are opening that use glycerol as a characteristic substance (counting for the making of epichlorohydrin itself) [3] as an outcome of the tremendous flood of glycerol that is outlined subsequently (10% in weight) in gathering biodiesel fuel by transesterification of seed oils with methanol. To frame the example, the overall glycerol market was 800 000 tons in 2005 with 400 000 tons from biodiesel conversely, with 60 000 tons simply in 2001 [4]. Over the course of recent years, biodiesel has emerged as a sensible fuel and as a fossil diesel added substance to supersede sulfur, whose content is progressively brought down according to all the more close natural guideline. Until the late developments in oil costs, high creation costs made biofuels unbeneficial without government apportionments. In any case, the rising formation of biodiesel isn't erroneously kept up with and is expected to spread and augmentation, as biodiesel gives satisfactory advantages to legitimize sponsorship [5]. Other than the finish of creation plants, industry answered this current situation by starting investigation to find new usages of glycerol as an insignificant cost feedstock for valuable subordinates either for mass use, for instance, added substances for concrete [6], then again as a precursor of regarded fine manufactured compounds.

Thuja occidentalis Q
Thuja occidentalis Linn. of the family cupressaceae, conventionally known as American

arbor vitae, is a neighborhood of North America from Quebec South wards to North California, creates along the banks of streams, streams and in saturated spots. It is introduced in India from North America. Thuja is an evergreen tree up to 20 m tall has a battered cone formed crown of branches bearing basically 4-sides twigs that are completely covered by scale like what's more, eagerly covering leaves. The leaves and twigs on steam refining yield 0.6 to 1.0% camphor like normal demulcent called oil of thuja or white cedar leaf oil, sp.gr. 0.925, limit 190-206c, with no issue dissolvable in alcohol. The basic constituent of the oil is d-thujone which is poisonous (W.I., 1976) [7]. It circles back to the muscles of the uterus, Americans drink a tea of the internal
bark to propel ladylike cycle. Thuja also contain unusual oil, sugar, thick matter, wax, sap and thujin. Unstable oil can be refined from leaves and used as vermifuge (Regret, 1971). From a distance, a wash of flavor is considered useful for such skin defilements as impetigo and moreover for moles. Homeopaths recommended it for body smell, morning cerebral agony and moles and is moreover used in Homeopathic system for condylomatous advancement, wiped out effect of vaccination, gonorrhea, sycotic tortures, tearing in muscles and joints, extraordinarily horrifying and sensitive privates (Clark, 1975). The decoction has been used in broken fever, firmness, dropsy, hacks, scurvey what's more, as an emmenagogue. The leaves made in to a salve with fat are valuable for neighboring application in firmness. A mixture of the variety into venereal moles is said to make them evaporate (Greive, 1971).

Materials and Methodology

Type of study: Analytical study
Site of study: CR4D (Centre of Research for development Parul University).
Duration: 2 Week
Tools: UV-VIS (spectroscopy) and FTIR (Fourier Transform infrared spectroscopy)
Materials: Beaker (100 ml capacity), pipette 10 ml capacity, Glass rod, measuring cylinder (100 ml capacity)
Medicinal products: *Thuja occidentalis*- Q were purchased from GMP Certified Pharmaceutical Pvt. Ltd (SBL), Glycerine Purchase from Chemdyes Corporation Laboratory chemicals, Industrial chemicals, solvents, metallurfy chemicals, food preservatives, filter papers, safety Goods.
Vehicle: Glycerol

Preparation

Through this research work preparing glycerol with the help of *Thuja occidentalis*- Q in definite ratio like (1:1), (1:4) and (1:9). Afterwards divide the whole preparation into three main categories like; Standard sample, Main sample, Control sample.

Standard sample

Thuja occidentalis- Q

Main sample

Thuja occidentalis glycerol (1:1)
Thuja occidentalis glycerol (1:4)
Thuja occidentalis glycerol (1:9)

Control sample

Glycerine

Steps to follow.

Sterilization

Cleansing of all the equipment's by strong alcohol with drying by Hot air oven for 15 minutes.

Measurement

Take appropriate amount of Medicine and vehicle with pipette (10 ml capacity) in the clean, dry beaker. Like; Medicine.

- ***Thuja occidentalis* glycerol in (1:1)**

Thuja occidentalis Q- 5 ml
Glycerol- 5 ml

- ***Thuja occidentalis* glycerol in (1:4)**

Thuja occidentalis Q- 5 ml
Glycerol- 20 ml

- **Thuja occidentalis glycerol in (1:9)**

Thuja occidentalis Q- 2 ml
Glycerol- 18 ml

Mixing

Apply gentle mixing the given formulation by glass rod until and unless if homogeneous mixture formed.

Filling

The prepared formulation of Homoeopathic medicated glycerol should be filled in the hard glass bottle. Which should be clean, sterile and non-coloured bottles.

Storage

The given formulation should be preserved into the hard glass bottle which should be away from dampness, sunlight, strong smelling bottles and cool, dark place.

Labelling

Paste the label on the bottom of hard glass bottle as;

a. Name of formulation
b. Name of Medicine with quantity
c. Name of vehicle with quantity
d. Drug and vehicle ratio
e. Manufacture Date
f. Manufacturer By
g. Indications
h. Storage

Analysis

The prepared formulation of *Thuja occidentalis* glycerol in all ratio were divided to three groups. Such as; Standard group, Main sample group and Control group. Around (3-4) ml of samples from each group were placed in the sterile, dry cuvette in UV- VIS Chamber.

UV- VIS Range

(400- 800) nm

Results

The Maximum absorbance of *Thuja occidentalis* Q is 0.851 at 607 nm, *Thuja occidentalis* glycerol (1:9) is 0.231 at 536 nm, *Thuja occidentalis* glycerol (1:1) is 0.738 at 609 nm, *Thuja occidentalis* glycerol (1:4) is 0.400 at 610 nm.

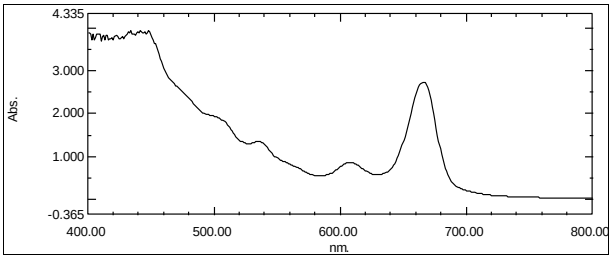

Fig 1: Absorbance of *Thuja occidentalis* Q

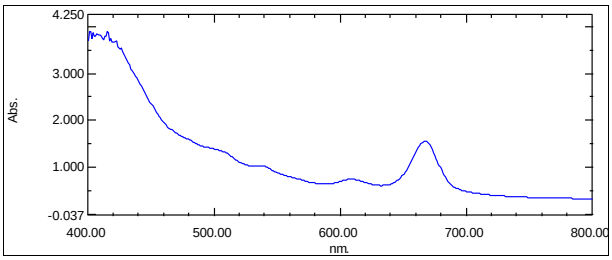

Fig 2: Absorbance of *Thuja occidentalis* Q Glycerol (1:1)

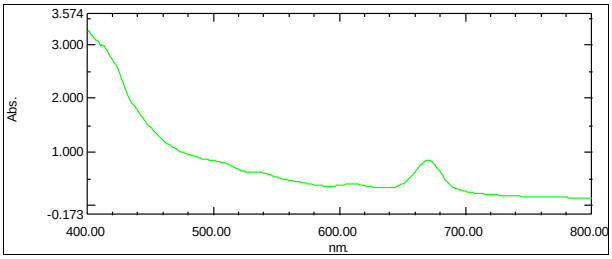

Fig 3: Absorbance of *Thuja occidentalis* Q Glycerol (1:4)

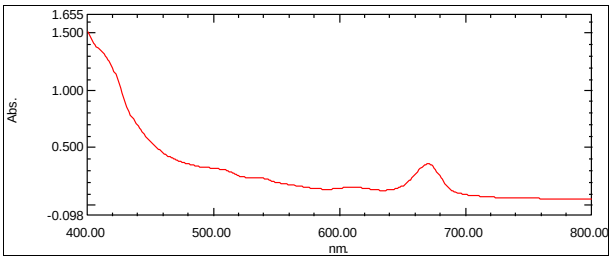

Fig 4: Absorbance of *Thuja occidentalis* Q Glycerol (1:9)

Table 1: Absorbance value of *Thuja occidentalis* Q, *Thuja occidentalis* Q Glycerol (1:9), *Thuja occidentalis* Q Glycerol (1:4), *Thuja occidentalis* Q Glycerol (1:1)

S. No.	Wavelength	Thuja occidentalis Q	*Thuja occidentalis* glycerol (1:9)	*Thuja occidentalis* glycerol (1:4)	*Thuja occidentalis* glycerol (1:1)
1.	549.00	0.976	0.196	0.886	0.531
2.	550.00	0.954	0.192	0.874	0.523
3.	551.00	0.935	0.190	0.863	0.516
4.	552.00	0.918	0.187	0.853	0.509
5.	553.00	0.903	0.185	0.844	0.503
6.	554.00	0.890	0.183	0.835	0.498
7.	555.00	0.877	0.181	0.827	0.492
8.	556.00	0.865	0.179	0.820	0.488

Table 2: FTIR of *Thuja occidentalis* Q

TOLC (after Cr(VI) adsorption	Bond stretching values
3682	Phenolic – OH stretching band
334.28	Hydroxyl – OH stretching band
2886.92	Carboxylic acid – OH stretching band
2978.86	–CH–, $–CH_2$ antisymmetric stretching vibration
2308.34	C=O stretching in CO_2
1712	C=O stretching in carboxylic acid
1600	C=C in aromatic
1386.58	–C–H bending vibration
1237, 1044	C–O stretching in hydroxyl, acids or phenolic
601	Aromatic –C–H bending vibration
553.	C–S stretching band

Table 3: FTIR of *Thuja occidentalis* Q Glycerol (1:1)

TOLC (after Cr(VI) adsorption	Bond stretching values
3682	Phenolic – OH stretching band
3389	Hydroxyl – OH stretching band
2888.46	Carboxylic acid – OH stretching band
2935.79	–CH–, $–CH_2$ antisymmetric stretching vibration
2277	C=O stretching in CO_2
1712	C=O stretching in carboxylic acid
1600	C=C in aromatic
1388	–C–H bending vibration
1237, 1037.69	C–O stretching in hydroxyl, acids or phenolic
782	Aromatic –C–H bending vibration
542.13	C–S stretching band

Table 4: FTIR of *Thuja occidentalis* Q Glycerol (1:4)

TOLC (after Cr (VI) adsorption	Bond stretching values
3650.88	Phenolic – OH stretching band
3389	Hydroxyl – OH stretching band
2934.60	Carboxylic acid – OH stretching band
2886.40	–CH–, $–CH_2$ antisymmetric stretching vibration
2277	C=O stretching in CO_2
1656.63	C=O stretching in carboxylic acid
1600	C=C in aromatic
1388	–C–H bending vibration
1237, 1034.11	C–O stretching in hydroxyl, acids or phenolic
782	Aromatic –C–H bending vibration
630	C–S stretching band

Table 5: FTIR of *Thuja occidentalis* Q Glycerol (1:9)

TOLC (after Cr (VI) adsorption	Bond stretching values
3691.46	Phenolic – OH stretching band
3321.56	Hydroxyl – OH stretching band
2934.11	Carboxylic acid – OH stretching band
2879.34	–CH–, $–CH_2$ antisymmetric stretching vibration
2277	C=O stretching in CO_2
1712	C=O stretching in carboxylic acid
1600	C=C in aromatic
1388	–C–H bending vibration
1237, 1032.62	C–O stretching in hydroxyl, acids or phenolic
782	Aromatic –C–H bending vibration
630	C–S stretching band

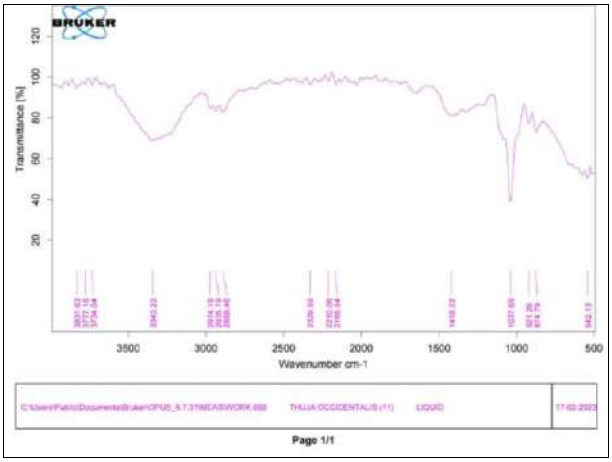

Fig 5: FTIR of *Thuja occidentalis* glycerol (1:1)

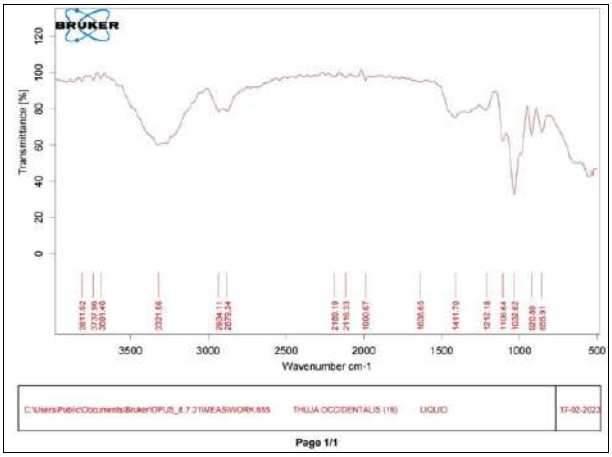

Fig 7: FTIR of *Thuja occidentalis* glycerol (1:9)

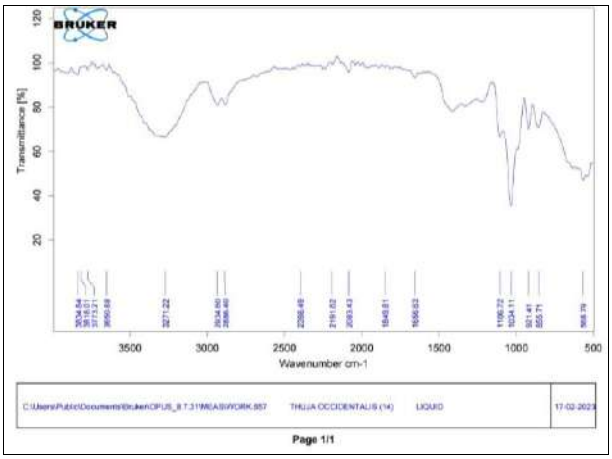

Fig 6: FTIR of *Thuja occidentalis* glycerol (1:4)

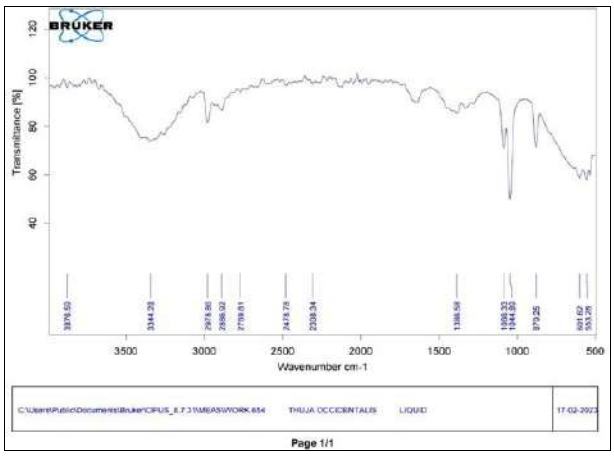

Fig 8: FTIR of *Thuja occidentalis* Q

Conflict of Interest
No such Conflict of Interest

Conclusion
Glycerol is one of the semisolid vehicle (Triglycerides), which gives soothing effect while applying on the surface of skin. It also prevents the dryness of the skin and make it free from certain bacterial infections. Through this prepared glycerol with homoeopathic mother tincture i.e. *Thuja occidentalis* which gives an excellent results on Certain skin diseases like warts, corns, herpetic eruptions, eczema, psoriasis, scalp irritation.

Acknowledgement
Authors would like to thanks Dr Poorav Desai sir for constant support to complete this research work and Faculty of CR4D Department for this work, Parul University to provide us a biggest platform.

References
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2. See the recent report from Frost & Sullivan: "R&D Creating New Avenues for Glycerol" (August 4, 2006), available online at https://www.frost.com/prod/servlet/market-insight-top.pag?docid = 77264824.
3. The US agribusiness company Archer Daniels Midland recently announced plans to make propylene glycol from glycerol instead of propylene oxide. Dow Chemical closed its glycerol plant in Texas early this year when Procter & Gamble Chemicals shut down a natural glycerol refinery in England. See: a) M. McCoy, Chem. Eng. News 2006, 84(6), 7; b) M. McCoy, Chem. Eng. News. 2006;84(2):32.
4. As of July 2006, pure glycerol was sold at 600–800 E/ton while crude glycerol of high quality obtained by biodiesel production was sold at 600–700 E/ton with glycerol currently priced at around 850 USD/ton. At prices approaching 770 USD/ton, glycerol becomes a significant platform chemical. If, as anticipated, biodiesel production grows to 3.23 million tons worldwide, an extra 323 000 tons of glycerol would reach the market thus rendering glycerol a readily available commodity.
5. Biodiesel yields a net energy balance ratio of 1.93 (i.e. 93% more energy produced than the energy invested in its production, whereas ethanol yields only 25% more energy): J. Hill, E. Nelson, D. Tilman, S. Polasky, D. Tiffany, Proc. Natl. Acad. Sci. USA. 2006;103:11, 206.
6. Crude glycerol from biodiesel production is an excellent additive for concrete, enhancing its resistance to compression and grinding and lowering its setting time. Mechanical tests carried out on "clinker" (the cement precursor which is mixed with gypsum to yield the concrete) samples doped with crude glycerol show, in all cases, that raw glycerol imparts better mechanical and chemical properties compared to those samples doped with commercial additives, including pure glycerol. Tests on an industrial scale using trucks of crude glycerol confirmed the results on the laboratory scale, and commercialization of cement added with biodiesel glycerol started in late 2006. M. Rossi, M. Pagliaro, R. Ciriminna, C. Della Pina, W. Kesber, WO2006051574. 2004.
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