

FTIR Analysis of Homoeopathic medicated Mustard hair oil by *Thuja occidentalis* Q

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KEYWORDS

Thuja occidentalis Q, Standardization, FTIR

ABSTRACT

Through this research work preparing the Homoeopathic medicated Hair oil by Mixing Organic Mustard oil in the *Thuja occidentalis* Q as definite proportion, afterwards Standardization done by using FTIR (Fourier Transform infrared spectroscopy to determine various functional groups.

Introduction

Originally from eastern North America, *Thuja occidentalis*—also referred to as Arbour vitae or white cedar—is planted as an ornamental tree in Europe (1). During a 16th-century trip, Canadian aboriginal Indians discovered the plant's medicinal properties and discovered that it was useful in treating scurvy-related weakness (2). *Thuja occ* has been used in folk medicine to cure a variety of conditions, including rheumatism, amenorrhoea, uterine carcinomas, psoriasis, enuresis, and bronchial catarrh (3–6). These days, homoeopathy mostly uses it as a dilution or mother tincture (7,8). This medicinal plant is also utilised as evidence-based phytotherapy for acute and chronic infections of the upper respiratory tract when combined with other immunomodulating herbs including *Echinacea purpurea*, *Echinacea pallida*, and *Baptisia tinctoria*. tract (9,10), as well as in cases of severe bacterial infections such sinusitis, bronchitis, angina, pharyngitis, and otitis media when used in conjunction with antibiotics (11, 12). The botany, composition, and certain pharmacological characteristics of this herbal remedy for the common cold are all covered in a number of reviews and monographs (3,13–17); most of them are, however, outdated or written in German. Thus, our goal was to create a current, thorough, and evidence-based study of *Thuja occ* that addresses its phytochemistry, in vitro and in vivo pharmacology, safety, and effectiveness. In order to get further information or unpublished data, makers of preparations containing *Thuja* were contacted and the MEDLINE databases were explore.

Methodology & Material

Study Type: Analytical

Duration: 1 Month

Study : CR4D (Centre of research & Development of Parul University)

Standardization device: FTIR (Fourier Transform Infrared spectroscopy)

Drug choice: *Thuja occidentalis* linn Q (MT) is a medication.

Vehicle: Organic Mustard Oil used as a Vehicle

Purchased:

All the mother tincture were purchased from (GMP Certified Pharmaceutical Pvt. Ltd)

There after preparation of homoeopathic medicated hair oil done by three phases, such as

Preparations:

Phase I- Mixing of the homoeopathic mother tincture in mustard oil as decimal scale as like 1:9 drug and vehicle proportion.

Phase II- Indirect heating of homoeopathic medicated oil under hot water bath, afterwards take 1st part of mother sample and mixed with 9 parts of mustard oil.

Phase III- Filtration should be done after cooling down the heated Homoeopathic medicated hair oil.

Phase IV- Storage of homoeopathic medicated hair oil in hard glass bottle, colourless bottles with proper labelling on its body. Sample analysis were done by taking passing 3-4 sample under UV- chamber in double beam UV- Visible spectrophotometer.

Results

After FTIR Analysis it was found that there are many functional groups were determined in Prepared

Mustard Hair oil by *Thuja occidentalis Q* as N-H Strch mode, O-H Strech. (COOH), C=N Strech mode, -O stretch mode, (alcohol), C-O Strech mode (Ether), C-O Strech mode, C-F Strech mode, C-H out of plane bending mode, CH out of plane bending mode (Aromatic ring)

Table. no. 1. FTIR Scanning of Prepared *Thuja occidentalis* mustard hair oil (Thuja occidentalis- Q X Pharmaceutical Pvt. Ltd

S. no.	Wavelength	Functional groups
1.	3449.68	N-H Strch mode
2.	3278.68	=C-H Strech mode, O-H Strech. (COOH), N-H Strech mode 1amide- 2 bands, 2 amide- 1 bands
3.	2926.63	O-H Strech. (COOH)
4.	1746.42	C=O Strech (ester)
5.	1458.55	N-H (Bending in secondary amide)
6.	1160.86	C-O Strech (alcohol), C-O Strech (ether), C-O Strech mode, C=O Bending mode, C-F Strech mode
7.	719.73	=C-H out of plane bending mode, C-H out of plane bending (aromatic ring), C-Cl stretch mode

Table. no. 2. FTIR Scanning of Prepared *Thuja occidentalis* Mustard hair oil (Thuja occidentalis- Q Y Pharmaceutical Pvt. Ltd

S. no.	Wavelength	Functional groups
1.	3617.17	-OH Strech mode
2.	3296.60	=C-H Strech mode, O-H Strech mode, N-H Strech mode (1 amide-2 bands) (2 amides- 1 bands)
3.	3010	=C-H SP2 C-H Strech., C-H SP2 C-H (Aromatic), -OH Strech mode (COOH)
4.	2925.88	O-H Strech mode (COOH)
5.	2856.74	C-H Strech mode. (Aldehyde), O-H Strech mode (COOH)
6.	2349.14	C=N Strech mode
7.	664.00	C=O Strech. (Ester)

Table. no. 3. FTIR Scanning of Prepared *Thuja occidentalis* mustard Hair oil (Thuja occidentalis- Q Z Pharmaceuticals Pvt. Ltd

S. no.	Wavelength	Functional groups
1.	3334.88	C-H Strec. Mode Hydrogen bonded O-H Band , N-H Streh. Mode, O-H Strech.mode, N-H Strech mode.
2.	2977.56	O-H Strech mode carboxylic acid
3.	2888.88	O-H Strech mode (COOH)
4.	2243.09	C=C Strch mode, C=N Strech mode
5.	1383.11	C-O-H Bending mode, NO2 Symmetric stretch mode.
6.	1045.41	C-O stretch mode, (alcohol), C-O Strech mode (Ether), C-O Strech mode, C-F Strech mode.
7.	879.66	C-H out of plane bending mode, C-H out of plane bending mode (Aromatic ring)

Conclusion

After analysis done by FTIR Spectroscopy it was found that there are many functional groups were present in prepared *Thuja occidentalis* Mustard hair oil.

Acknowledgement

The CR4D Department at Parul University has completed this study work, and the authors would like to thank them.

References

1. Chang LC, Song LL, Park EJ, et al. Bioactive constituents of *Thuja occidentalis*. J Nat Prod 2000;63:1235–8.
2. Millspaugh CF. American Medicinal Plants. *Thuja*. Dover Publications, New York, 1974.
3. British Herbal Pharmacopoeia. *Thuja*. British Herbal Medicine Association, West Yorks, UK, 1983, 210–1.
4. Shimada K. Contribution to anatomy of the central nervous system of the Japanese upon the vermal arbour vitae. Okajimas Folia Anat Jpn 1956;28:207–27.
- 5 Baran D. Arbor vitae, a guarantee of health. Rev Med Chir Soc Med Nat Iasi 1991;95:347 9.
6. Offergeld R, Reinecker C, Gunz E, et al. Mitogenic activity of high molecular polysaccharide fractions isolates the cupressaceae *Thuja occidentalis* L. enhanced cytokine-production thyapolsaccharide, g-fraction (TPSg). Leukemia 1992;6:189–91.
7. Homöopathisches Arzneibuch (HAB). *Thuja* Monograph. Deutscher Apotheker Verlag, Stuttgart, 1985, 876–7.
8. Homöopathisches Arzneibuch (HAB). *Thuja* Monograph. Deutscher Apotheker Verlag, Stuttgart, 2003;1–2.
9. Reitz HD, Hergarten H. Immunmodulatoren mit pflanzlichen Wirkstoffen–2. Teil: eine wissenschaftliche Studie am Beispiel Esberitox® N. Notabene Medici 1990;20:304–6, 362–6.
10. Vorberg G. Bei Erkältung unspezifische Immunabwehr stimulieren. Ärztl Prax 1984;36:97–8.
11. von Blumröder WO. Angina lacunaris. Z Allgemeinmed 1985;61:271–3.
12. Zimmer M. Gezielte konservative Therapie der akuten Sinusitis in der HNO-Praxis. Therapiewoche 1985;35:4024–8.
13. Madaus G. Lehrbuch der Biologischen Heilmittel. Vol. III. *Thuja occidentalis*. Thieme Verlag, Leipzig, 1938, 2698–701.
14. Harnischfeger G, Stolze H. Bewährte Pflanzendrogen in Wissenschaft und Medizin. Notamed Verlag, Bad Homburg/Melsungen, 1983, 250–9.

15. Hänsel R, Keller R, Rimpler H, Schneider G. (eds) Hagers Handbuch der Pharmazeutischen Praxis: Drogen P -Z (Thuja), 5th edn. Springer Verlag, Berlin, 1994, 955–66.
16. Neth R, Drize N, Gohla S, Offergeld R, Reski R, Schruhm S. Phytotherapeutische Forschung: Thuja occidentalis L. Z Allgemeinmed 1995;71:522–30.
17. Beuscher N, Kopanski L. Reinigung und biologische Charakterisierung von antiviralen Substanzen aus Thuja occidentalis. Planta Med 1986;52: 555–6.