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**COMPARATIVE STUDY OF HOMOEOPATHIC PREPARATION OF  
*ARNICA MONTANA*, *CALENDULA OFFICINALIS*, AND *HYPERICUM  
PERFORATUM* Q AND 30 WITH THE HELP OF U.V SPECTROSCOPY**

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**ABSTRACT**

The discipline of measuring and interpreting electromagnetic spectra is known as spectroscopy. This crucial exploration tool in the fields of chemistry, material sciences, and physics enables the investigation of the composition, physical structure, and electronic structure of matter at the atomic, molecular, and macro sizes. This study used UV spectroscopy to compare and analyze the potencies of mother tinctures of *Hypericum Perforatum*, *Calendula Officinalis*, and *Arnica Montana* on a 30-centimeter scale.

Although the bulk of homeopathic medications involve alcohol, their potencies and powers vary from one another, as demonstrated by the types of spectra they create.

**Keywords:** UV Spectroscopy, *Arnica montana*, *Hypericum perforatum*, *calendula officinalis*

## INTRODUCTION

Dr. Samuel Hahnemann developed the homeopathic medical method in the 18<sup>th</sup> century. Homeopathic remedies are made from a variety of materials, including plants, animals, minerals, sarcodes, Nosodes, Imponderabilia, and more. The primary source of homeopathic medicine is the realm of plants. These sources are used to make the mother tincture first, followed by the potentization procedure to extract the potencies. Trituration is used for insoluble drug ingredients, and succussion is utilized for soluble drug substances. Potentization is the process by which the drug's dynamic curative property is evoked by simultaneous friction and dilution [1, 2, 3]. Three potentization scales exist. There are three scales: decimal, centesimal, and 50 millimeters. Dr. Samuel Hahnemann introduced the centesimal scale in his fifth edition of the Organon of Medicine.

It is more popular and most used potencies in homeopathic medicines all over the world. In potentisation as the potencies goes on *increasing*, the dynamic curative power of medicine also increases and the material quantity of drug will go on decreasing, during this process of potentisation. The size of the drug aggregates is most likely decreased by the mechanical energy that is imparted. The substance then readily passes past the membrane barrier, increasing the medication's effectiveness. It is discovered

that 12°C potency in homeopathy crosses Avogadro's number, and it is the last potency in which the traces of original drug substances can be visualised microscopically, in higher potencies no particle of original drugs is detectable, but the actions of the medicines are perceived. [1, 2, 3].

Essential nano bubbles are created during succussion, and when an ethanol-water solution is present, it serves as a cross-linker for the silicon polymerization process in the sodium silicate solution. A mesomicroporous structure is created when Nano bubbles become caught in these silicate polymer chains after they have achieved elastoplasticity. During successive dilutions, this coating is essential in keeping the initial active ingredient from dissolving or being diluted [18, 21].

Present study is a comparison in Mother Tincture and 30 potencies of Arnica Montana, Calendula officinalis and Hypericum perforatum, the medicines which are used in treating the injuries in Homoeopathy.

Spectroscopy is the study of how matter absorbs and emits light and other radiation. They primarily process the radiation's wavelength. Here, the sample is exposed to an electromagnetic radiation beam, such as UV rays, and the wavelength of the

electromagnetic spectrum is used to quantify the sample's reaction [12, 13, 14].

A spectrometer is a scientific device used in molecular spectroscopy that is primarily used to analyze the wavelength of electromagnetic radiations by measuring and isolating the spectrum components according to their physical phenomena.

In physical and analytical chemistry, spectroscopy is used to identify, ascertain, or measure a sample's molecular and/or structural makeup [15, 16, 17].

- Because each atom and molecule have a distinct spectrum, spectroscopy is utilized in both physical and analytical chemistry. Consequently, information about the atoms and molecules may be detected, identified, and quantified using these spectra.18, 19
- Determining an object's temperature, velocity, and chemical composition in space.
- Metholite analysis and screening, as well as drug structure improvement.
- Using a mass spectrometer to measure the mass-to-charge ratio of compounds or nanoparticles that have been sampled.
- Tracking the amount of diffused oxygen in aquatic and freshwater environments.

- Determining a sample's atomic structure [20-23].

## **MATERIALS AND METHODS: -**

### **1.1 Materials: -**

1. Test Drug Homoeopathic remedy will be obtained from the standardized local Homoeopathic Pharmacy of the institution after identification and authentication by the subject experts.
2. The instrument utilized was a UV-visible double beam spectrophotometer with 1 cm matched quartz cells, a digital balance (Citizen Co.), and a micropipette with a variable volume of 10-1000 L from the BSRC, Belagavi Quality Assurance Lab. Chemicals and Reagents: Every chemical and reagent used, including sodium hydroxide, potassium dihydrogen phosphate, ethanol, and hydrochloric acid, was of analytical quality and acquired from a typical laboratory.

### **Methodology: -**

1. The homoeopathic formulations of Arnica Montanan-Q & 30, Calendula officinalis Q & 30 and Hypericum Q & 30 were procured from local pharmacy, which will be further analysed by spectroscope to assess the Scattering of molecule at different wavelengths along with intensities at [(UGC-DAE,

CSR) BSRC, Belagavi. The spectra will be collected within the wavenumber region of (50 - 4000 cm-

1) and analysed after suitable baseline correction.

**RESULTS:-**

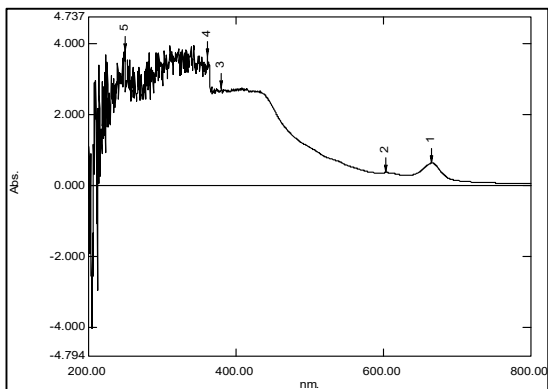


Figure 1: UV Spectra of Arnica Montana - Mother Tincture

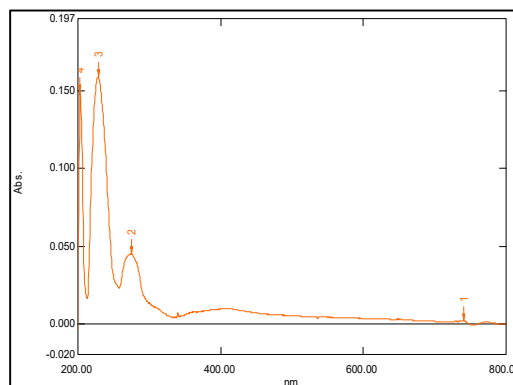


Figure 2: UV Spectra of Arnica Montana -30 Mmothe Tincture

Table 1: UV Spectra of Arnica M - 30

1.1 Arnica montana Mother Tincture		
No.	Wavelength	Abs.
1	665.50	0.630
2	603.50	0.362
3	380.50	2.745
4	361.00	3.651

Table 2: UV Spectra of Arnica M - Mother Tincture

1.2 Arnica montana 30 CH		
No.	Wavelength	Abs.
1	740.00	0.002
2	275.50	0.045
3	228.50	0.159
4	203.00	0.150

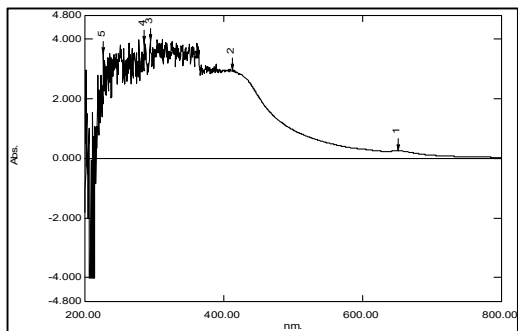


Figure 3: UV Spectra of Calendula Officinalis - Mother Tincture

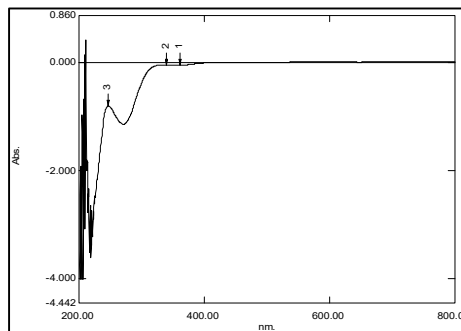


Figure 4: UV Spectra of Calendula officinalis -30

Table 3

2.1. <i>Calendula officinalis</i> Mother Tincture		
No.	Wavelength	Abs.
1	651.50	0.258
2	412.50	2.971
3	294.00	3.946

Table 4

2.2. <i>Calendula officinalis</i> 30 CH		
No.	Wavelength	Abs.
1	360.50	-0.049
2	339.50	-0.049
3	247.00	-0.809

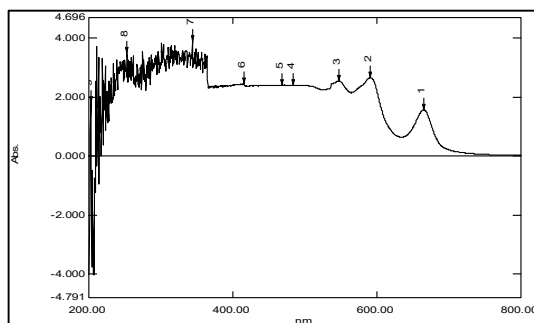


Figure 5: UV Spectra of Hypericum Perforatum - Mother Tincture

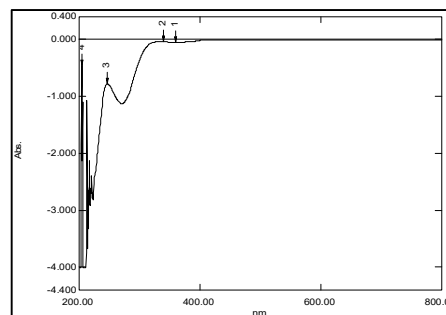


Figure 6: UV Spectra of Hypericum Perforatum - 30 CH

Table 5

2.1. <i>Hypericum perforatum</i> Mother Tincture		
No.	Wavelength	Abs.
1	665.00	1.569
2	591.00	2.654
3	547.00	2.551
4	484.00	2.410
5	468.00	2.409

Table 6

2.2. <i>Hypericum perforatum</i> 30 CH		
No.	Wavelength	Abs.
1	360.00	-0.046
2	340.00	-0.038
3	246.50	-0.780
4	204.50	-0.462

## DISCUSSION

Methanol was used as a blank.

The 3-mother tincture samples and their dilutions (30 CH) were carried out for UV Spectroscopy analysis where,

1. *Arnica montana* mother tincture showed spectra at 665 nm wavelength and *Arnica montana*

dilution (30 CH) showed spectra at 275 nm wavelength.

2. For *Hypericum perforatum* mother tincture, sample showed spectra at 665 nm and 591 nm wavelengths and for *Hypericum perforatum* dilutions (30 CH), there was no absorption of sample hence did not detect any spectra.

3. For *Calendula officinalis* mother tincture and its dilution (30 CH), there was no absorption of sample hence did not detect any spectra.

Spectroscopy spectrum which y 200-900nm shows us the presence of individual physiochemical characteristics and supramolecular chemistry in medicines. The spectral variety of all the medicines are different from each other and does not show similarity, hence it can be concluded from above study that the Homoeopathic medicines are not mere dilution or alcohol but has its own physiochemical characteristics each homeopathic potency is analyzed and their disparities are plotted graphically. The study provided a scientific basis of Homoeopathic medicine, Homoeopathic medicines are prepared from a wide range of sources, including minerals, plants, and animals. In addition, modern technology has improved in comparison to the traditional processes used to prepare homeopathic medications. This leads to the need for improvements in standardization procedures for both quantitative and qualitative analysis. Numerous studies in this area have demonstrated the value of vibrational spectroscopy and spectroscopy for identifying unique characteristics of homoeopathic medications at extremely high dilution. Even at larger potencies, the approach seems to be a very promising tool for monitoring and analyzing homoeopathic

dilution since it allows for quick, non-destructive assessments. An important step in guarantying the caliber and effectiveness of these treatments is the standardization of homoeopathic medicine through the use of spectroscopy [18-20].

Homeopathic medications work as improved micro and nanoscale copies of their original material through direct local ligand receptor interactions at extremely low potencies [2]. Through the electromagnetic, thermal, biological, optical, and quantum mechanical features of nanoparticles, a systemic adaptive network produces dynamical effects at greater potencies. Thus, it may be argued that the dilution and other preparation techniques employed in homeopathic medicine change the sizes, shapes, and surface charges of nanoparticles [21, 22].

leading to variations in their physiochemical characteristics and biological consequences [31]. Nanoparticles with extremely high potency (sub-nanoscale or higher) are present in ultra-diluted homoeopathic medication.

According to a research, the amount of medication needed is lowered by orders of magnitude when it is in nanoparticle form, which complies with homeopathic principles [18]. Extremely low homoeopathic potencies might have direct pharmacological or hypersensitive consequences linked to improved

medication delivery, bioavailability [23, 24].

#### CONCLUSION-

In conclusion, variations in the electronic levels of different chromophoric groups inside molecules form their unique spectrum. These alterations include a comparatively large quantity of energy being absorbed along with modifications to the molecule's rotational and vibrational energy. These vary depending on the potency level. As a result, homoeopathic treatments differ spectroscopically from the original solvent (ethanol/water). It should be mentioned that U.V. spectroscopy can clearly discern between various homoeopathic potencies and dilutions of the same therapy. Additionally, UV spectroscopy has been helpful in examining the minute yet important alterations in the structural characteristics of both alcohol- and water-based treatments. hence it can be concluded from above study that the Homoeopathic medicines are not mere dilution or alcohol but has its own physiochemical characteristics each homeopathic potency is analysed and their disparities are plotted graphically.

#### REFERENCES:

[1] Mandal PP, Mandal B. A textbook of homoeopathic pharmacy. 3rd ed. Delhi, India: New Central Book Agency; 2012,11,12,289,294.

- [2] D. D. Banerjee, Augmented Textbook of Homoeopathic Pharmacy, 4<sup>th</sup> edition, B Jain Publishers; Pg. no. 37,654.
- [3] Sumit Goel, Art and Science of Homoeopathic Pharmacy 2<sup>nd</sup> edition; IBPP Publisher, Page no 202.
- [4] B.K. Sarkar Hahnemann's Organon of Medicine, 9<sup>th</sup> revised edition, Novelty printers, Delhi, Pg no 448
- [5] Homoeopathic Pharmacopoeia of India (HPI), Vol. I, 1st edition p-194 fornia 1979; page no 85
- [6] Rajendran ES. Field Emission Scanning Electron Microscopic (FESEM) and Energy Dispersive Spectroscopic (EDS) Studies of Centesimal Scale Potencies of the Homeopathic Drug Lycopodium clavatum. American Journal of Homoeopathic Medicine. Spring. 2015;108(1):9-18.
- [7] 22 Types of Spectroscopy with Definition, Principle, Steps, Uses.
- [8] 10.1: Overview of Spectroscopy - Chemistry LibreTexts
- [9] 22 Types of Spectroscopy with Definition, Principle, Steps, Uses
- [10] Use of Raman spectroscopy in standardization of homoeopathic medicine: A review to the importance of emerging technologies in homoeopathy.

- [11] UV Spectroscopic Analysis Of Homoeopathic Medicine Insulinum 1c To 12c: Insights Into Potency Variation.
- [12] Malik, Nancy. Recent Advances in Nanoparticle Research in Homeopathy. *Homeopathy* 4 Everyone. 2015, 12.
- [13] High sensitivity <sup>1</sup>H-NMR spectroscopy of homeopathic remedies made in water | BMC Complementary Medicine and Therapies | Full Text.
- [14] Physicochemical Investigations of Homeopathic Preparations: A Systematic Review and Bibliometric Analysis—Part 1 - PMC
- [15] Homoeopathy: A Nano medicine
- [16] Physicochemical Investigations of Homeopathic Preparations: A Systematic Review and Bibliometric Analysis—Part 2 | The Journal of Alternative and Complementary Medicine.
- [17] [PDF] Use of Raman spectroscopy in standardization of homoeopathic medicine: A review to the importance of emerging technologies in homoeopathy | Semantic Scholar.
- [18] Investigation of the Origin of Voltage Generation in Potentized Homeopathic Medicine through Raman Spectroscopy | Request PDF
- [19] UV-Vis. Spectroscopy: Herbal Drugs and Fingerprints | Springer Link
- [20] (PDF) Active principle in potentised medicines: Nanoparticle versus quantum domain – An overview.
- [21] Unraveling the Low Frequency Triggered Electromagnetic Signatures in Potentized Homeopathic Medicine.
- [22] <https://www.homoeopathicjournal.com/articles/1144/8-2-36-612.pdf>
- [23] Iris R Bell, Gary E. Schwartz. Enhancement of adaptive biological effects by nanotechnology preparation methods in Homeopathic Medicines *Homeopathy*. 2015;104(2):123-138.
- [24] Soni N. Homoeopathy from Nano medicine to Quantum Medicine. *International Journal of Ayurvedic and Herbal Medicine*. 2014;4(6):1671-1677.