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Dr. Suraj Singh Bhadoria
Assistant Professor, Department of Homoeopathic Pharmacy (UG), Parul Institute of Homoeopathy & Research, Parul University, Vadodara, Gujarat, India

Corresponding Author:
Dr. Suraj Singh Bhadoria
Assistant Professor, Department of Homoeopathic Pharmacy (UG), Parul Institute of Homoeopathy & Research, Parul University, Vadodara, Gujarat, India

Determination of drug particle in human blood serum after treatment with homoeopathic medication by UV-visible spectrophotometer

Suraj Singh Bhadoria

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Abstract
Background: Through this research work determining the drug particle of Simplex Homoeopathic Medicine Arsenic album 200 in human blood serum by UV- visible spectrophotometric analysis (Double beam).
Methodology: Take 2 ml Human blood serum before and after the treatment of administering Homoeopathic Medicine Arsenic album 200 after repertorizaton. Sample should be analyzed under UV-visible spectrophotometer (Double beam) in determining concentration of drugs.
Results: Determining the Multiple absorption peaks of *Arsenic album* 200 in between 533.0 nm and 667.0 nm.
Conclusion: Successfully determination of drug particle of Simplex Homoeopathic medicine arsenic album 200 in human blood serum by UV- visible spectrophotometric analysis (Double beam).

Keywords: Arsenic album, UV- visible spectrophotometric, Human blood serum

Introduction

The physical method of optical spectroscopy known as UV-VIS spectroscopy uses light in the visible, ultraviolet, and near-infrared spectrums. It is founded on the Beer-Lambert rule, which asserts that a solution's absorbance is directly proportional to the path length and the absorbing species' concentration in the solution. It can therefore be used to ascertain the absorber concentration in a solution for a specific path length. It is required to determine the rate at which absorbance varies with concentration, since it has been widely used over the past 37 years, UV-VIS spectroscopy has emerged as the most crucial analytical tool in contemporary labs. In numerous applications, Although other methods could be used, none of them compare to UV-VIS spectroscopy in terms of ease of use, adaptability, precision, speed, and affordability [1,2].

The UV-Vis Spectroscopy Principle: When radiation induces an electronic transition in a molecule's or ion's structure, the molecule or ion will show absorption in the visible or ultraviolet spectrum. As a result, when a sample absorbs light in the visible or ultraviolet spectrum, the electrical states of the molecules within the sample also change. The light's energy will encourage electrons to move from their orbital from the ground state to the excited state, anti-bonding orbital, or greater energy. Three different kinds of ground state orbitals could be at play [3-4].

1. σ molecular bonding
2. The molecular orbital π (bonding)
3. n atomic orbital (non-bonding).

Absorption of Ultraviolet Light Spectrophotometry

Due to lower equipment costs and fewer maintenance issues, spectrophotometry is typically used, particularly by small-scale companies. The analysis technique is based on quantifying how much monochromatic light is absorbed by colorless substances in the 200-400 nm range of the near ultraviolet spectrum. The basic idea behind how a spectrophotometer that measures the ultraviolet area works is that light with a specific wavelength interval travels

through a solvent-filled cell before landing on a photoelectric cell, which converts the radiant energy into electrical energy that can be measured by a galvanometer. The absorbance spectra of a substance in solution or as a solid can be obtained using ultraviolet-visible spectroscopy. The absorbance of light energy is what spectroscopy is actually observing. or electromagnetic radiation, which causes the compound or material's electrons to be excited from their ground state to their first singlet excited state. The area of energy visible to the UV for The wavelength range of the electromagnetic spectrum is 800-200 nm, or 1.5-6.2 EV. The basis for absorbance spectroscopy is the Beer-Lambert Law [5-8,13,14].

UV-Vis Spectroscopy Applications.

UV -vis spectroscopy has many different applications.

1. Impurity detection
2. Clarification of organic substances' structures
3. Analysis that is quantitative
4. Analysis of qualitative data
5. Analysis of chemicals
6. Pharmaceutical compound quantitative analysis
7. The acid-base dissociation constant
8. Determining molecular weight
9. As an HPLC detector 10. Beer-Lambert law deviations [9,10,11,12].

Materials and Methodology

- **Type of study:** Analytical study.
- **Site of study:** Homoeopathic Pharmacy Laboratory, Parul Institute of Homoeopathy & Research, Parul University, Vadodara.
- **Duration of study:** 1 week.
- **Analytical tool used**: UV- Visible spectrophotometer.
- **Drug:** Arsenicum album 200.
- **Software name:** Lab Solutions UV-Vis.
- **Version:** 1.13.
- **Instrument type:** UV- 1900 Series.
- **Model (S/N):** UV1900i (A12536082607).
- **Wavelength:** 400-800 nm.
- **Data interval:** 0.5 nm.
- **Scan speed:** Medium.

Case Details

Diagnosed Case: Eczema

Date:04/05/24

Repertorization by: Homeopathic software

Symptoms list

1. Mind, Fastidious
2. Mind, Insecurity, Mental
3. Skin, Eruptions, Burning, Touch, Agg.
4. Skin, Eruptions, Crusty, Brown
5. Skin, Pain, Scratching, After
6. skin, swelling, affected parts, of
7. Stomach, Desires, Salt Things
8. stomach, thirst, cold drinks, amel. by drinking cold water

Remedies list

1. Ars || Arsenicum album|| S:4 R:9
2. Sulph || Sulphur|| S:4 R:8
3. Puls || Pulsatilla nigricans|| S:3 R:7
4. Con || Conium maculatum|| S:4 R:5
5. Nat-m || Natrum muriaticum|| S:3 R:6
6. Phos || Phosphorus|| S:3 R:6
7. Sil || Silica terra|| S:3 R:6
8. Calc || Calcarea carbonica Hahnemanni|| S:3 R:5
9. Sep || Sepia succus|| S:3 R:5
10. Thuj || Thuja occidentalis|| S:4 R:4
11. Merc || Mercurius solubilis Hahnemanni|| S:2 R:5
12. Nux-v || Nux vomica|| S:3 R:4
13. Plb || Plumbum metallicum|| S:3 R:4
14. Arg-n || Argentum nitricum|| S:2 R:4
15. Bell || Belladonna|| S:2 R:4
16. Bry || Bryonia alba|| S:2 R:4
17. Carb-v || Carbo vegetabilis|| S:2 R:4
18. Caust || Causticum Hahnemanni|| S:2 R:4
19. Cocc || Cocculus indicus|| S:3 R:3
20. Lyc || Lycopodium clavatum|| S:2 R:4
21. Nit-ac || Nitricum acidum|| S:2 R:4
22. Rhus-t || Rhus toxicodendron|| S:2 R:4
23. Verat || Veratrum album|| S:2 R:4
24. Alum || Alumina, Aluminium oxydata|| S:2 R:3
25. Canth || Cantharis vesicatoria|| S:2 R:3

Prescription

Arsenicum Album 200

3 m.M Ss Aq.pur. OD X 1days

(3drops liquid mix in half pure water taken for Once a day up to 1 days only)

Procedure

Take 1 ml Human blood serum before and after the treatment of administering Homoeopathic Medicine *Arsenic album* 200 after repertorizaton. Sample should be analyzed under UV-visible spectrophotometer (Double beam) in determining concentration of drugs.

Glimpses of research activity

Fig 1: Blood withdrawn before intervention of Homoeopathic Treatment

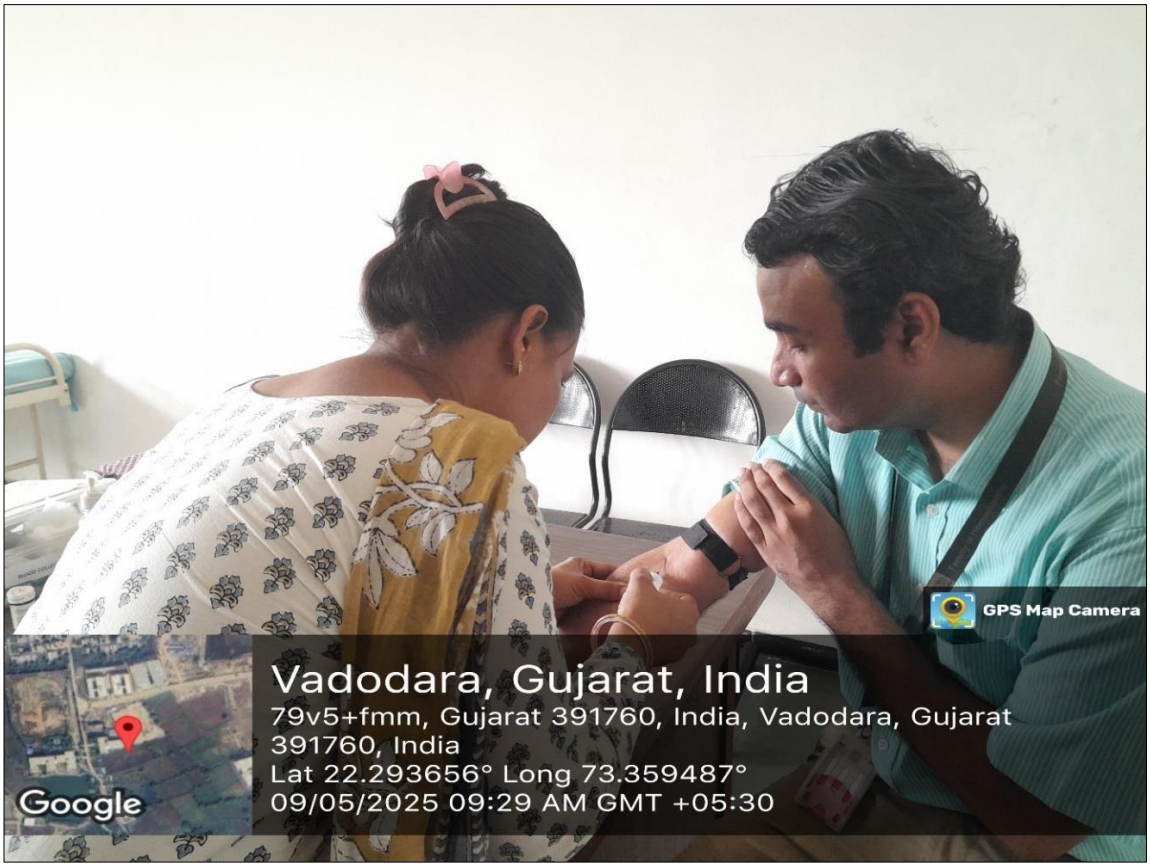

Fig 2: Blood withdrawn after intervention of Homoeopathic Treatment

Fig 3: UV- visible spectrophotometric analysis for determining Homoeopathic Medicine

Fig 4: Human Blood serum analysis before intervention of Homoeopathic medicine through UV- visible spectrophotometric analysis for determining Homoeopathic Medicine

Results

Determining the Multiple absorption peaks of *Arsenic album* 200 in between 533.0 nm and 667.0 nm UV- visible spectrophotometer analysis is given below;

Table 1: Peak area distribution of Alcohol base

Start	End	Divisor	Area	Result
400.00	800.00	1.00	0.015	0.015

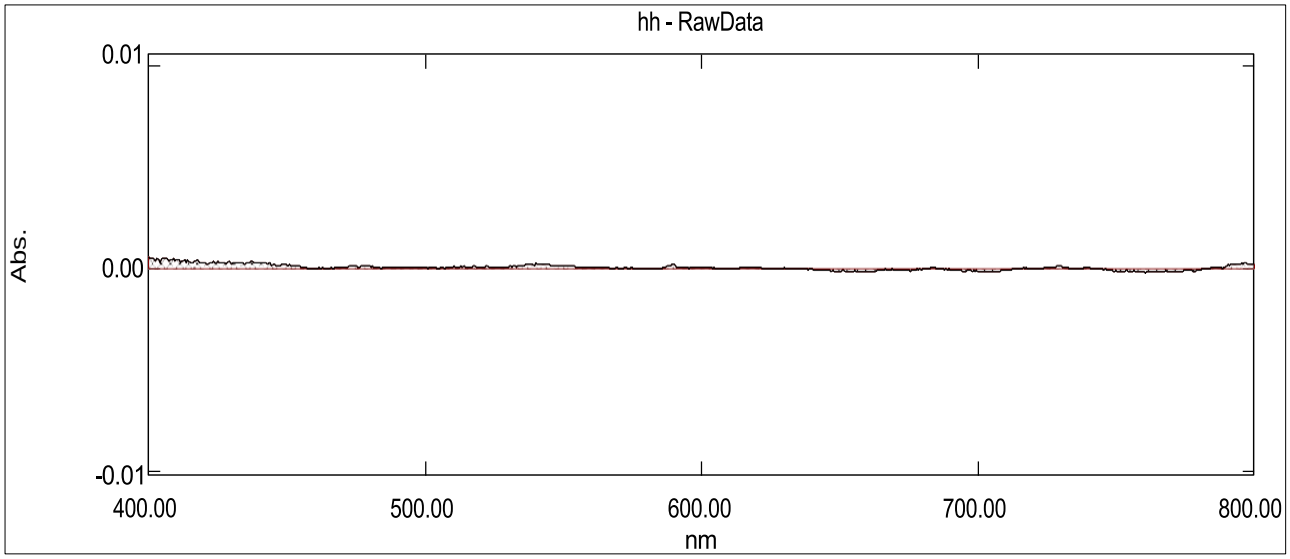

Fig 5: Peak area distribution of Alcohol base

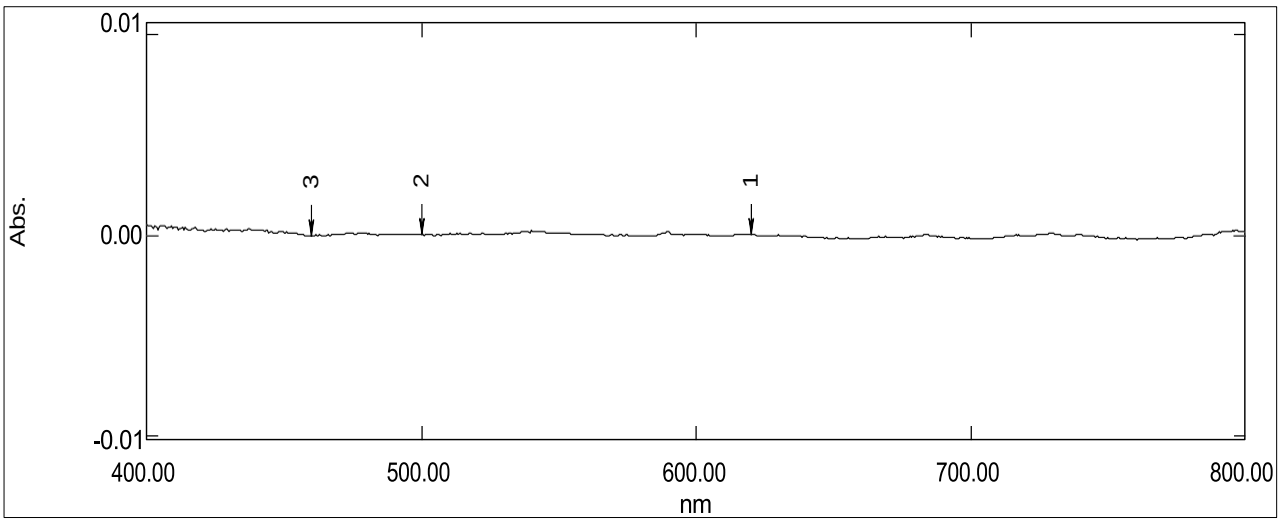

Fig 6: Absorption spectra of Alcohol base

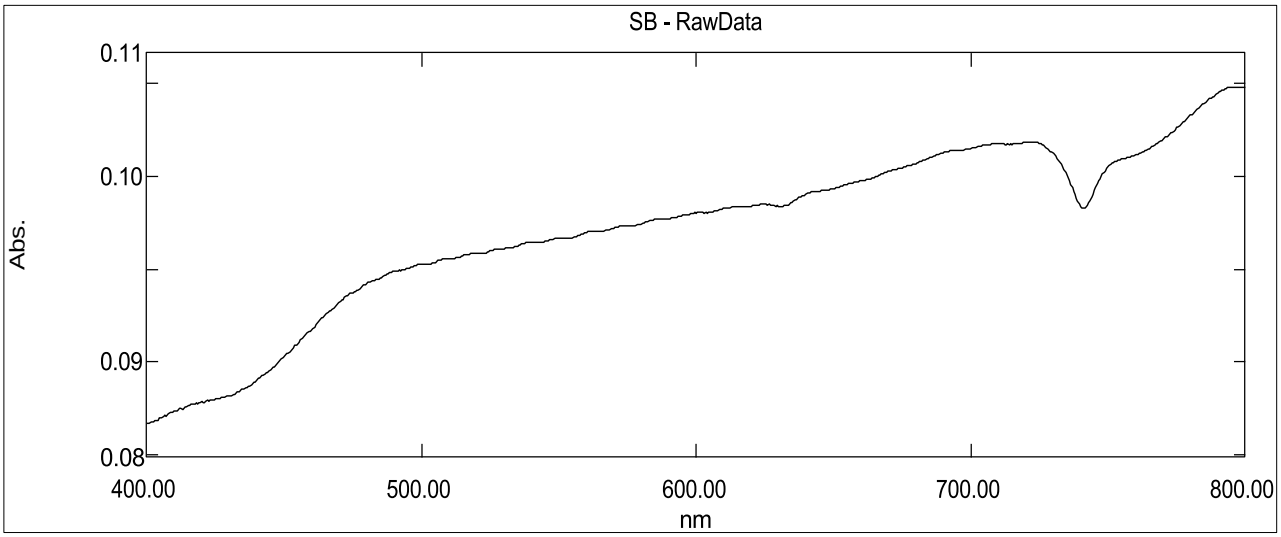

Fig 7: Absorption spectra of Human blood serum before Administration of *Arsenic album* 200

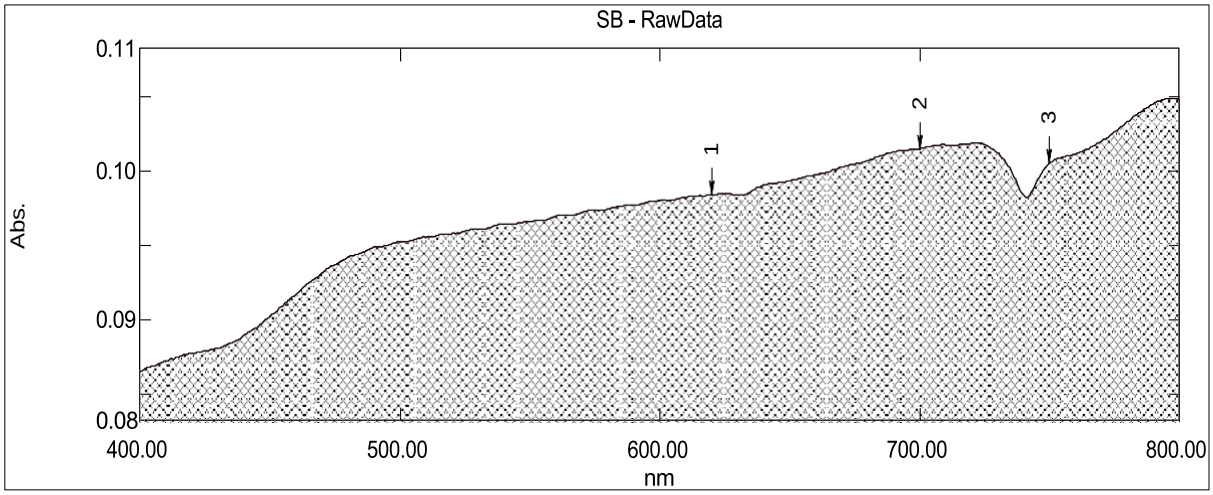

Fig 8: Absorption spectra of Surface area distribution of Human blood serum before Administration of *Arsenic album* 200

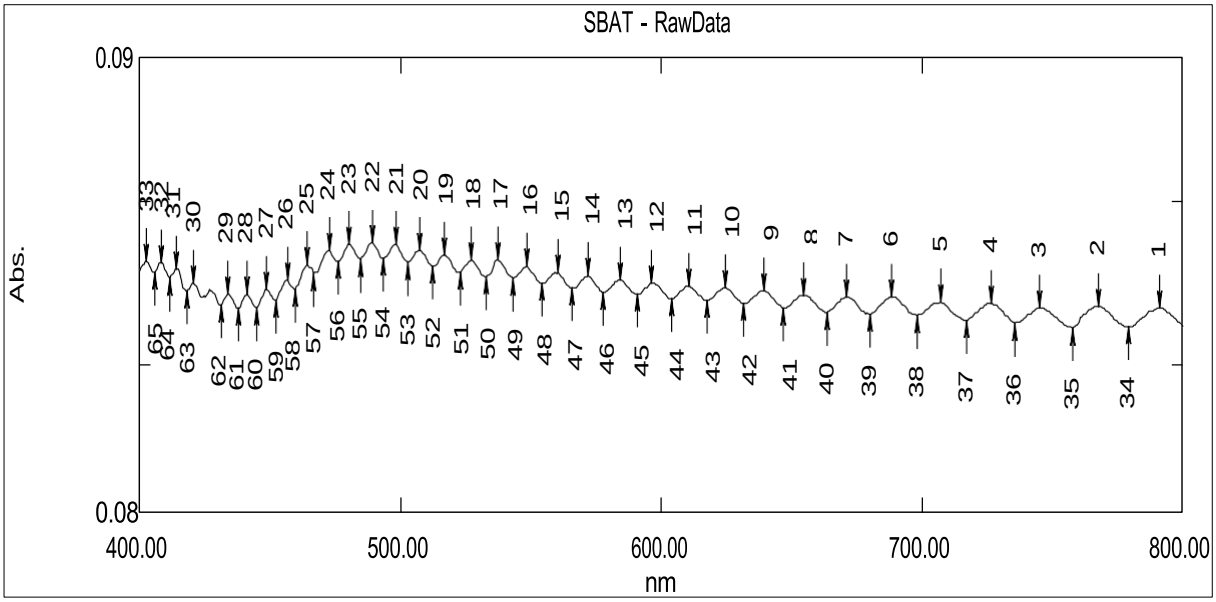

Fig 9: Absorption spectra of Surface area distribution of Human blood serum After Administration of *Arsenic album* 200

Table 2: Absorption spectra of Human blood serum after Administration of *Arsenic album* 200

S. No.	Wavelength (nm)	Absorbance	Peak/Valley
1	722.00	0.1019	PEAK
2	741.50	0.0983	PEAK
3	791.00	0.0867	PEAK
4	767.50	0.0868	PEAK
5	745.00	0.0868	PEAK
6	726.50	0.0869	PEAK
7	707.00	0.0869	PEAK
8	688.50	0.0871	PEAK
9	671.00	0.0871	PEAK
10	654.50	0.0871	PEAK
11	639.50	0.0873	PEAK
11	624.50	0.0874	PEAK
12	610.50	0.0874	PEAK
13	596.50	0.0875	PEAK
14	584.50	0.0876	PEAK
15	572.00	0.0877	PEAK
16	560.50	0.0878	PEAK
17	548.50	0.0880	PEAK
18	537.50	0.0882	PEAK
19	527.50	0.0882	PEAK
20	517.00	0.0884	PEAK
21	507.50	0.0885	PEAK
22	498.50	0.0887	PEAK

23	489.50	0.0887	PEAK
24	480.50	0.0887	PEAK
25	473.00	0.0885	PEAK
26	464.50	0.0880	PEAK
27	457.00	0.0876	PEAK
28	449.00	0.0873	PEAK
29	441.50	0.0872	PEAK
30	434.00	0.0872	PEAK
31	421.00	0.0875	PEAK
32	414.50	0.0879	PEAK
33	408.50	0.0881	PEAK
34	403.00	0.0882	PEAK

Conclusion

Successfully determination of drug particle of Simplex Homoeopathic medicine arsenic album 200 in human blood serum by UV- visible spectrophotometric analysis (Double beam)

Conflict of Interest

No such

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