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Comparative spectrophotometric analysis of *Andrographis* lotion and *Cephalandra indica* lotion by UV- Visible spectrophotometer

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Abstract

Through this research work standardization of Homoeopathic medicated lotion prepared by *Andrographis* and *Cephalandra indica* as a separately in the definite proportion of drug and vehicle ratio under UV- Visible spectrophotometer (Double Beam). After analysis through UV- Visible spectrophotometer it was found that absorbance capacity of *Andrographis P Q* is 0.05 at 760.50 nm, *Andrographis P* lotion is Atnm, *Cephalandra indica* lotion is 0.847 at 442.00 nm, *Cephalandra indica Q* is 0.896 at 570 nm.

The absorbance capacity of *Cephalandra indica* lotion is better than *Andrographis P* lotion in terms of absorbance value by UV-visible spectrophotometer.

Keywords: Lotion, UV- visible spectrophotometer, *Andrographis P*, *Cephalandra indica*

Introduction

It is crucial to analyze, identify, and characterize the materials used in the creation and restoration of artworks, which are frequently complex systems, in order to give curators, conservators, and conservation scientists the tools they need to comprehend and preserve the cultural heritage [1, 2]. Currently, research on the Materials used to create artworks can be applied in an invasive or non-invasive manner, such as Spectroscopy techniques that are categorized based on the electromagnetic spectrum region in which they are applied were generated during the assessment [2].

Ultraviolet-visible spectroscopy, in its broadest definition, studies the interactions between matter and electromagnetic radiation in the ultraviolet-visible range. The ultraviolet (UV) spectrum encompasses about the electromagnetic spectrum's 10-380 nm range. Typically, it is split into three primary sub-regions, which belong to the following wavelength ranges: UVA, 320-380 nm; UVB, 280-320 nm; and UVC, 100-280 nm. Furthermore, the 10-200 nm range is frequently referred to as vacuum ultraviolet (VUV), despite the fact that measurements in this range are only made when empty. The visible (Vis) area includes the spectral range of 380-750 nm. The stimulation of an atom's outermost electrons is connected to UV-Vis spectroscopy and is engaged in the production of molecules, so the term "electronic spectroscopy" [3] is frequently used to describe it. Metrics inside the Transmittance, reflectance, and photoluminescence tests are often conducted in the UV-Vis range (fluorescence and modes of phosphorescence. Measurements of transmittance and reflectance must be documented in relation to a reference. Substance, however observations of photoluminescence can be regarded as absolutes.

Fundamentals and theories

When ultraviolet and visible light strike a surface, they can interact with matter in a variety of ways: they can be absorbed, absorbed and emitted as photoluminescence (Phosphorescence and fluorescence), transmitted, transmitted in a diffuse way, reflected (in a specular and diffuse way, as discussed below), or laterally diffused at wavelengths different from those of the incident monochrome radiation (diffusion or Raman effect) [4].

When incident radiation frequency matches the energy difference of a transition between two energy levels, the material absorbs that particular frequency, which excites resonance and modifies the distribution of electronic density (electronic spectroscopy). The Bohr model can be used to illustrate this effect:

$$E_2 - E_1 = h\nu - h\nu = hc\bar{\nu} = hc/\lambda = \Delta E$$

Andrographis paniculata

Andrographis paniculata, sometimes referred to as the "King of bitters," "Fa Talai Jone," "Kariyat," or "Green chiretta," is a member of the Acanthaceae family, which is native to South Asian nations [5]. It is also widely distributed throughout tropical and subtropical Asia, as well as South-East Asia [6]. It is a well-known traditional remedy [7] that is utilized in Chinese, Thai, Ayurvedic, and even Scandinavian medicine [8]. Andrographolide [6], the active ingredient in *Andrographis paniculata*, has a variety of pharmacological actions, including as anti-inflammatory [9], antipyretic [9], antiviral [10], antidiarrheal [11], and immunostimulant properties [12, 13]. The WHO Monograph states that women who are pregnant or nursing should not take *Andrographis paniculata*.

Cephalandra indica

Cephalandra indica has been used in the Ayurvedic medical system to treat diabetes [14]. One more *Momordica monadelpha* and *Coccinia indica* are the names of these plants. It belongs to the *Cephalandra* genus and family, Cucurbitaceae. Particular term: *indica* In Naudin *Cephalandra indica* is the botanical name. Ann. Sc. Nat. Ser. V. v. Naudin (1866) 16 [15]. This plant grows widely in Bengal and most of India in its natural state. Some people have referred to it as the "Indian substitute for Insulin," and doctors in Kolkata firmly believe that it can treat glycosuria [14].

It contains an enzyme with amylolytic qualities, a hormone, and traces of an alkaloid, according to a different study by Chopra and Bose [4]. It also doesn't cause a drop in blood or urine sugar levels in patients with glycosuria. Ghose [16] demonstrated how to use this medication in homoeopathy, also provided a few case studies regarding its efficacy in treating diabetes mellitus in mother tincture.

Preparing Homoeopathic medicated lotion as per Homoeopathic Pharmacopoeia rules and regulations by mixing *Andrographis P* and *Cephalandra indica* mother tincture in a base of Distilled water separately.

Materials and Methodology

Site of study: PIHR (Parul Institute of Homoeopathy & Research)

Type of study: Analytical study

Tool used: UV- Visible spectrophotometer (Double beam)

Medicinal Products: *Andrographis P Q* were procured from GMP Certified Pharmaceutical Company whereas *Cephalandra indica Q* prepared in the Laboratory as per the (HPI Homoeopathic Pharmacopoeia guidelines)

Duration: 1 week

Preparations

Homoeopathic medicated lotion

As per Homoeopathic Pharmacopoeia of India guidelines the drug and vehicle ratio were taken as (1:9) i.e 1 part is drug substances and 9 part is vehicle substances. There are following steps given below.

Step 1st: (Sterilization): first cleansing of all the laboratory utensils and tools.

Step 2nd: (Mixing): Mixed Drug as 1 part and vehicle as 9 parts in the clean measuring cylinder.

Step 3rd: (Filling): Homoeopathic medicated lotion was filled into the hard glass sterile bottle.

Step 4th: (Storage): The bottle should be stored under cool, dark place, away from the sunlight, away from the dampness.

Categorization of samples

Medicinal samples

1. *Andrographis P Q*
2. *Cephalandra indica Q*

Formulations sample

1. *Andrographis P* lotion
2. *Cephalandra indica* lotion

Control sample

Absolute Alcohol

Results

The absorbance capacity of *Andrographis Q* is 0.05 at 760.50 nm, *Andrographis P* lotion is Atnm, *Cephalandra indica Q* is 0.896 at 570 nm, *Cephalandra indica* lotion is 0.847 at 442.00

Table 1: Absorbance value of *Andrographis P Q*

No.	Wavelength nm.	Abs.	Description
1	760.50	0.0546	Peak

Table 2: Absorbance value of *Cephalandra indica Q*

No.	Wavelength nm.	Abs.	Description
1	573.00 nm	0.874	Peak

Table 3: Absorbance value of *Andrographis P* lotion

No.	Wavelength nm.	Abs.	Description
1	442.00 nm	0.519	Peak

Table 4: Absorbance value of *Cephalandra indica* lotion

No.	Wavelength nm.	Abs.	Description
1	442.00 nm	0.847	Peak

Conclusion

The absorbance capacity of *Cephalandra indica* lotion is better than *Andrographis P* lotion in terms of absorbance value by UV-visible spectrophotometer.

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