

Analysis of St. John's Wort in Distilled Water by UV-Visible Spectrophotometric method

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Abstract: In the present study a simple, precise, sensitive, accurate, selective, sensitive and cost effective UV-visible spectrophotometric method has been developed for analysis and estimation of St. John's wort in distilled water. The solution of St. John's wort was scanned over UV-Visible range (up to 630nm) for its wave length of maximum absorbance. Different calibration standard of St. John's wort were prepared and absorbance was recorded at λ_{max} at 640nm. Beer's Lambert laws is obeyed in calibration curve of concentration Vs absorbance was plotted with concentration range 1-8 $\mu\text{g/mL}$. The results of this analysis were validated statistically and was found to be satisfactory. The developed UV-visible method was successfully applied for the estimation of St. John wort in the routine analytical work.

Keywords: UV – visible spectrometry, St. John's wort validation, Distilled Water, Spectrophotometric Analysis

1. Introduction

The plant St. John's wort (Hypericum perforatum) is a low evergreen shrub. It grown in many region of the United States. St. John's wort is toxic in nature to range animals. [1] German physicians prescribed more 131 million daily doses of herbal medicinal products prepared from St. John's wort herb. [3]

St. John's wort is recommended for the treatment of mild depression, melancholia, abdominal and urogenital pain ulcerated burns [3-8]. St. John's wort is a complex mixture of chemicals including tannins, xanthenes flavonoids, phloroglucinol derivatives [9-10] one ingredient of St. John's wort hypericin has shown antiviral activity against viruses including the human immunodeficiency virus (HIV). [11]

It is a potent photosensitizer and has been tested as a photosensitizer in the treatment of cancer. [12]

Several worker's have been established different techniques for the analysis of St. John's wort and herbs these method include HPLC [13] Fluorescence microscopy [14] HPLC coupled to mass spectrometry (HPLC –MS) [15] solid phase extraction (SPE) [16] UV-spectroscopy [17-20] Fluorimetric [21-25] An effort was made to develop a simple sensitive, accurate Spectrophotometric method for the analysis of St. John's wort in Distilled water.

2. Materials and Methods

Materials: St. John's wort, Soxhlet apparatus, Visible spectrophotometer-105 Distilled water, Measuring flask.

Extraction procedures: Firstly crush and grind the St. John's wort and make a fine powder than the St. John's wort was extracted with Et₂OH For 6hour (approximate 10 cycles) in a Soxhlet apparatus after removal of Et₂OH get the dried powder of St. John wort extract.

Selection of Detection wavelength:

To determine the maximum wave length (λ_{max}) St. John's wort 10 $\mu\text{g/mL}$ of working standard solution was prepared in distilled water and examine in UV region 340-700nm used as blank. The results of St. John's wort showed maximum absorbance 640nm that the wave length select for estimation of St. John wort.

Preparation of stock solution:

St. John's wort 10 $\mu\text{g/mL}$ standard stock solution was prepared by adding precisely weighted 1.0mg of St. Johnwort extract 100mL volumetric flask and make up the solution with distilled water. Fig-1 Shown the over line spectrum graph of St. John's wort.

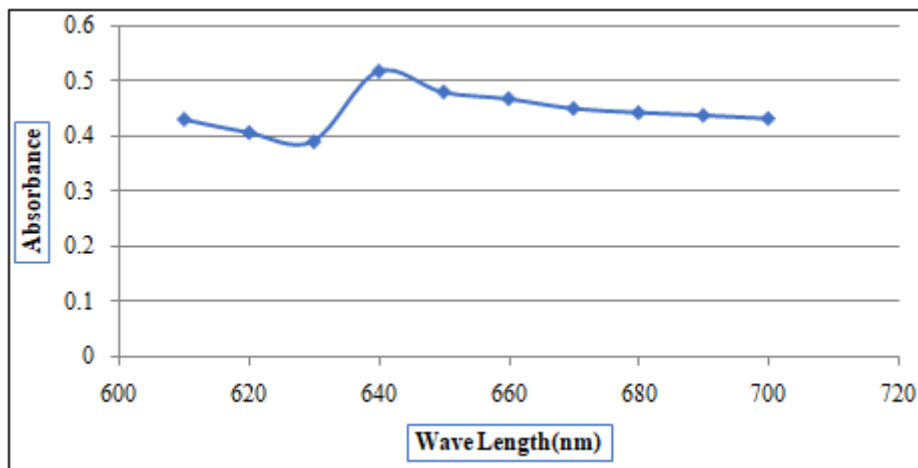


Figure 1: UV Spectrum of St. John's wort in distilled water

Preparation of Calibration curve:

Calibration curve was plotted over a concentration range of 1-8 $\mu\text{g}/\text{mL}$ for St. John's wort curve show in Fig.2 and the calibration data is shown in table – 1

Table 1: Calibration Data of St. John's wort in Distilled water

S. No.	Concentration ($\mu\text{g}/\text{mL}$)	Absorbance
1	1	0.0320
2	2	0.0330
3	3	0.0334
4	4	0.0348
5	5	0.0353
6	6	0.0358
7	7	0.0363
8	8	0.0372

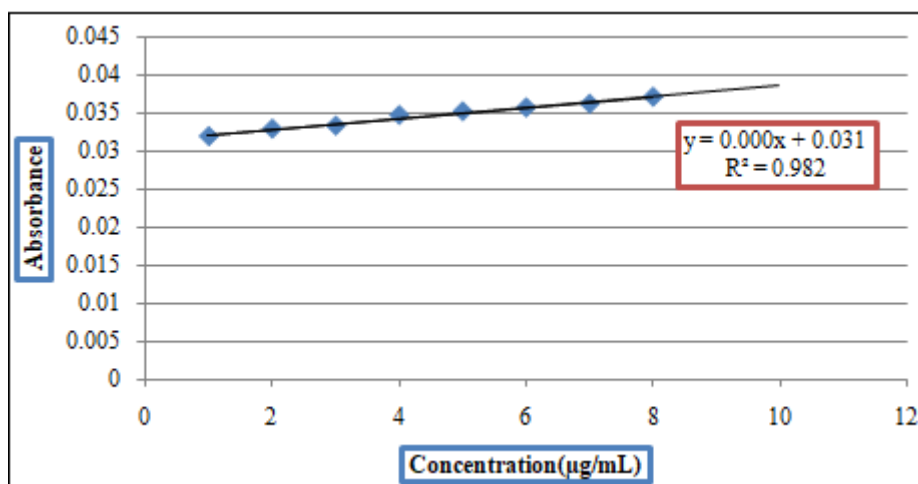


Figure 2: Calibration Curve of St. John's wort in Distilled Water

3. Result and Discussion

We start the discussion with short over view of the combination of different analytical techniques to generate the analytical platform for the characterization and estimation of St John's wort. In this analysis we used analytical steps plant material directly and extract derived there from and the spectra of St. John's wort was scanned in region between 340-700nm.

St. Johns shows maximum absorbance at 640 nm Which was selected as the detection of wave length the results of St. John's wort absorbance was found to be linear in increasing range of concentration 1-8 $\mu\text{g}/\text{mL}$ with good correlation which shown in Table.1 and Fig 2 this study suggest that the concentration of St. John's wort useful as antiviral activity

both in vitro and in vivo. It has been inactivate a number of viruses and retroviruses, including HIV, influenza A, herp simplex and others [11, 12, 27]

But the regular use of St. John's wort shown few side effects one concern is overexposure of sunlight because it contain hypericin which is a strong photosensitizer [28]

That is why only a small amount of St. John's wort is useful. As anti-inflammatory antiviral, anticancer and is mainly for the treatment of mild to moderate depression

4. Conclusion

St, john's wort is a common plant that has been used medicinally by different countries. This study focused on

quantitative estimation of St. John's wort in its API form and this UV-Visible spectrophotometric method can be used for the quantification of St. John's wort powder in routine analysis.

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