

## Research Article



## Phytochemical Analysis of *Bougainvillea Glabra Choisy* by FTIR and UV-VIS Spectroscopic Analysis

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### ABSTRACT

The present study was carried out to characterize the bioactive constituents present in flower extracts of *Bougainvillea glabra choisy* using UV-VIS, FTIR. The extract was examined under Visible and UV light for the proximate analysis. The crude extracts of *Bougainvillea glabra* were scanned in the wavelength ranging from 200-1100 nm by using Perkin Elmer spectrophotometer system and the characteristic peaks were detected. FTIR method was performed on a Perkin Elmer spectrophotometer system, which was used to detect the characteristic peak values and their functional groups. As the result UV-VIS profile showed the peaks at 324.00nm and 290.00nm for flavonoid and FTIR spectra showed the peak at 3364.58cm<sup>-1</sup> for OH group.

**Keywords:** *Bougainvillea glabra Choisy*, FTIR spectrum, UV-VIS spectrum, bioactive constitute.

### INTRODUCTION

Medicinal plant research includes much more than the discovery of new drugs. This field has been expanding to also include diverse subjects as negotiation of power based on medicinal plant knowledge.<sup>1</sup> The different phytoconstituents present in plants include anthraglycosides, bitter drugs, flavonoids, alkaloids, saponins, coumarins, phenol carboxylic acids and terpenes. These phytoconstituents confer specific characteristics and properties to plants. Therefore, the analysis of these constituents would help in determining various biological activities of plants. Natural products, either as pure compounds or as standardized plant extracts, provide unlimited opportunities for new drug.<sup>2</sup>

The determination of phytoconstituents is largely performed by relatively expensive and often laborious techniques such as gas (GC) and liquid (LC) chromatography combined with specific detection schemes.<sup>3, 4</sup> Analysis of small amounts of chemicals has become easier and more cost-effective owing to the development of hyphenated chromatographic techniques such as GC or LC-MS. GC-MS analysis can identify pure compounds present at less than 1 mg.<sup>5</sup>

However, simple, cost-effective and rapid tests for detecting phytocomponents are necessary. Spectroscopic (UV-Vis, FTIR) methods together or separate can be used in this sense as well as conventional methods.<sup>6, 7</sup>

The Fourier Transform Infrared (FTIR) spectroscopy allows the analysis of a relevant amount of compositional and structural information in plants. Moreover, FTIR spectroscopy is an established time-saving method to characterize and identified functional groups<sup>8</sup>. Ultraviolet-visible spectrophotometry (UV-Vis) related to the spectroscopy of photons in the UV-visible region. UV-visible spectroscopy uses light in the visible ranges or its adjacent ranges. The color of the chemicals involved is

directly affects the absorption in the visible ranges. Molecules undergo electronic transitions in these ranges of the electromagnetic Spectrum<sup>9</sup>.

The leaves of *Bougainvillea glabra* are reported to have anti-inflammatory activities, anti hyperglycemic activity<sup>10</sup> insecticidal activity,<sup>11</sup> anti hyperglycemic activity anti ulcer antimicrobial and anti-diarrheal activity and its antiviral protein was characterized by Balasaraswathi et al., 1998.<sup>12</sup> With this knowledge, the present research work was aimed to produce the UV-VIS and FTIR spectrum profile of *Bougainvillea glabra flower & bract* extract.

### MATERIALS AND METHODS

*Bougainvillea glabra choisy* and *Bougainvillea* California gold flower along with bracts were collected from Guru Govind Singh nursery, Bhopal. The flowers were removed from stalk and weight was taken then the flowers were dried under shade at room temperature. Then the flowers were powdered and weights of powdered were taken and the powders were stored in sterile container for further use.

#### Extraction Preparation

Then dried powder was taken into soxhlet apparatus for 72 hr according to successive solvent extraction using hydroalcoholic (50:50) solvent. Afterwards, the solvents were removed and the extracts obtained were stored

#### Spectroscopic analysis

To detect the UV-VIS spectrum profile of the *bougainvillea glabra flower & bract* extracts, the extract were scanned in the wavelength ranging from 200-800nm by using UV spectrophotometer and the characteristic peaks were detected. FTIR analysis was performed using Perkin Elmer spectrophotometer system which was used to detect the characteristic peaks and their functional groups. The peaks values of the UV-VIS and FTIR were recorded.



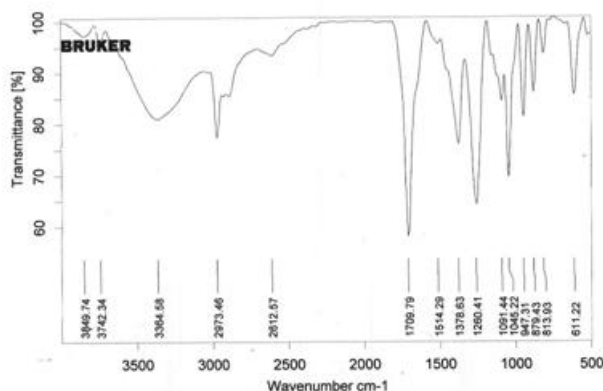
## RESULTS

### Functional groups identification

The FTIR spectrum was used to identify the functional groups of the active components present in extract based on the peaks values in the region of IR radiation. When the extract was passed into the FTIR, the functional groups of the components were separated based on its peaks ratio. The results of FTIR analysis confirmed the presence of alcohol, phenol, alkanes, aldehyde, aromatic compound, secondary alcohol, aromatic amines and halogen compound (fig-1, and table-1).

### Quantitative spectrophotometric analysis

The UV-VIS profile of plant extract was taken at the 200 to 800nm wavelength due to the sharpness of the peaks and proper baseline. The profile showed the peaks at 324.00nm and 290.00nm with the absorption 0.420 and 1.012 respectively (fig-2, and table-2).



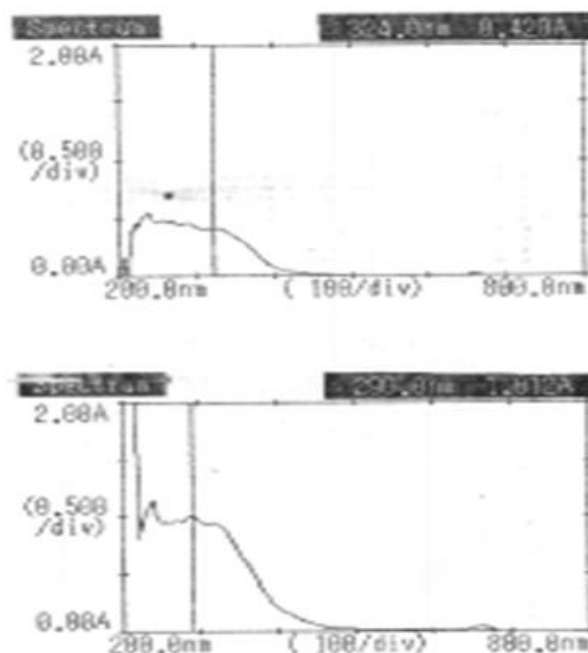
**Figure 1:** FTIR Spectrum of *bougainvillea glabra* flower & bract extract

**Table 1:** FTIR Peak Values of Extracts of *bougainvillea glabra* flower & bract extracts

S. No	Peak values	Functional groups
1	3364.58	Phenol
2	2973.46	Alkanes
3	1709.79	Aldehyde
4	1378.63	Alkanes
5	1260.41	Aromatic amines
6	1045.22	Carboxylic acid
7	947.31	alkenyl
8	879.43	alkenyl
9	813.93	Aromatic p- disubstituted
10	611.22	Halogen compound

**Table 2:** UV-VIS Peak Values of Extracts of *bougainvillea glabra* flower & bract extracts

S. No	Wavelength (nm)	Absorption
1	324	0.420
2	290	1.012



**Figure 2:** UV-VIS Spectrum of Extract of *bougainvillea glabra* flower & bract

## DISCUSSION AND CONCLUSION

An IR spectrum of this plant extract shows the presence of OH group and UV-VIS spectrum of this plant extracts has absorption bands at 324 and 290 nm. These absorption bands are characteristic for flavonoids and its derivatives. The flavonoids spectra typically consist of two absorption maxima in the ranges 230-290 nm (band I) and 300-350 nm (band II). The precise position and relative intensities of these maxima give valuable information on the nature of the flavonoids

Analysis of the flower and bract extract of sample under FTIR and UV-VIS spectroscopic technique showed that the presence of phenolic compound and flavonoid which can be isolated and further screened for different kind of biological activities depending their therapeutic uses. Further research will be needed to find out the structural analysis of flavonoid compound by use of different analytical methods such as NMR and Mass spectrophotometer.

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