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Spectro Chemical Analysis of Ethanol Extract Cathranthus Roseus Flower

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Abstract

Plants are considered as rich resources of ingredients which can be used in drug development pharmacopoeia Medicinal, non-pharmacopoeial or synthetic drugs. 100g of each plant part were extracted using different organic and aqueous solvents which have varying polarity (Petroleum ether, EtOAc, EtOH,H20).The extract was filter and the extract was subjected to column tube. Compound from the mixture of compounds collected from column tube. Alkaloid compound that are isolated from *C. roseus* . The isolated alkaloid class of compound was named as vindoline. The isolated vindolinecompound are found to be hypotensive, sedative and possess tranquilising and anti cancerous properties.

Key words: *C. roseus*, Ethanol extract, Vindoline,

Introduction

Plants are considered as rich resources of ingredients which can be used in drug development pharmacopoeia Medicinal, non-pharmacopoeia or synthetic drugs. A part from that, these plants play a critical role in the development of human cultures around the whole world. Plant is an important source of medicine and plays a key role in world health. Herbal medicines proved to be the major remedy in traditional system of medicine. About 90% of the herbs and medicinal plants in India are collected from the forest. The use of plant-based drugs all over world is increasing. Through recent researches on herbal plants or medicine, there have been great developments in the pharmacological evaluation of various plants used in traditional systems of medicine. Chemically prepared drugs may act quickly, but they have side effects which affect human body negatively in the long run, whereas, medicinal plants work in an integrated or pro-biotic with little or no adverse effects on the body .

Review of literature

In the last years, oxidative stress-related diseases/disorders have gained a special attention. Metabolic, neurodegenerative, cardiovascular, mitochondrial diseases and even cancer, are among the most frequent . Numerous studies have been investigating the underlying triggering factors, in order to understand the mechanisms of action of being directly related to the type of solvent used in the extraction, but also with plant origin, growing conditions, harvesting time, and storage conditions.

The study of the antioxidant potential of phenolic extracts derived from plant species in one of the hot topics among the scientific community; however, in vitro studies are the most common,

Catharanthus roseus contains significant amounts of volatile and phenolic compounds including caffeoylquinic acids and flavonol glycosides which are known to possess antioxidant activity1.

The flower and other parts of Catharanthus roseus exhibit antioxidant properties.Thus, phenolic compounds have redox properties that act as reducing agents, hydrogen donors, singlet oxygen quenchers or metal chelators. It has multiple applications in foods, cosmetics, and pharmaceutical industries. Besides antioxidant activity, these compounds exhibit antiallergic, anti inflammatory, antimicrobial, anti-thrombotic, cardio protective and vasodilatory effects2.

Materials and Method

1) Plant Collection

Catharanthus roseus was identified and mature plants were collected in the garden of Arulmigu Palaniyandavar College of Arts and Culture, Palani in the month of March. The plants were washed thoroughly with tap water to avoid dust. Then the plants were shade dried to avoid the loss of bio-active compounds.After complete drying, each part of the plant were subjected to mechanical grinding and collected in an air tight container.

2) Extract Preparation

100g of each plant part were extracted using different organic and aqueous solvents which have varying polarity (Petroleum ether,EtOAc,EtOH,H20).Each 250ml of the solvent were used, with the help of soxhlet apparatus the extract was prepared and stored in clean beakers. Soaking materials with 90% ethanol and leaving the mixture overnight has been used to extract and filter the compound from the mixture of compounds collected from column tube.

phytochemical analysis in *Catharanthus Roseus*

The feather compost treated powdered plant material was subjected for Successive extraction starting from non polar solvents such as petroleum ether, chloroform, Ethanol, and distilled water using soxhlet extracts. The extracts were concentrated to dryness. These extracts were used for preliminary screening of secondary metabolites.

1. **Test for Alkaloids**

To 1 ml of extract added 1 ml of Mayers reagent and few drop of Iodine solution.Formation of yellow colour precipitate indicated the presence of Alkaloids.

2. **Test for Terpenoids**

To 1 ml of crude extract add 1ml of concentrated H_2SO_4 and heated for 2 minutes. A grayish colour indicates the presence of terpenoids.

3. **Test for Phenol and Tannins**

To 1 ml of crude extract added 1 ml of FeCl3. A blue colour indicated presence of tannins.

4. Test for flavonoids

To 1 ml of extract added few fragments of magnesium ribbon and added few drops of concentrated HCl drop wise. Appearance of pink scarlet colour confirmed the presence of flavonoids.

5. Test for Saponins

To 1 ml of extract added 2 ml of distilled water shaken weak and formation of 1 cm layer of foam indicates presence of saponins.

6. Test for reducing sugar

To 1 ml of extract added 1 ml of Fehling's B solution. Formation of red colour indicated the presence of sugar.

7. Test for Quinines

To 1 ml of extract added 1 ml of 1% NaOH and mixed well. Apperance of blue green or red in indicates presence of Quinines.

8. Test for protein

To 1 ml of extract added few drop of mercuric chloride. Formation of yellow colour indicated the presence of protein.

9. Test for Steroids:

To 1 ml of extract mixed with 1 ml of chloroform and concentrated H_2SO_4sidwise. A red colour presence at the lower chloroform layer indicates presence of steroids.

RESULT AND DISCUSSION

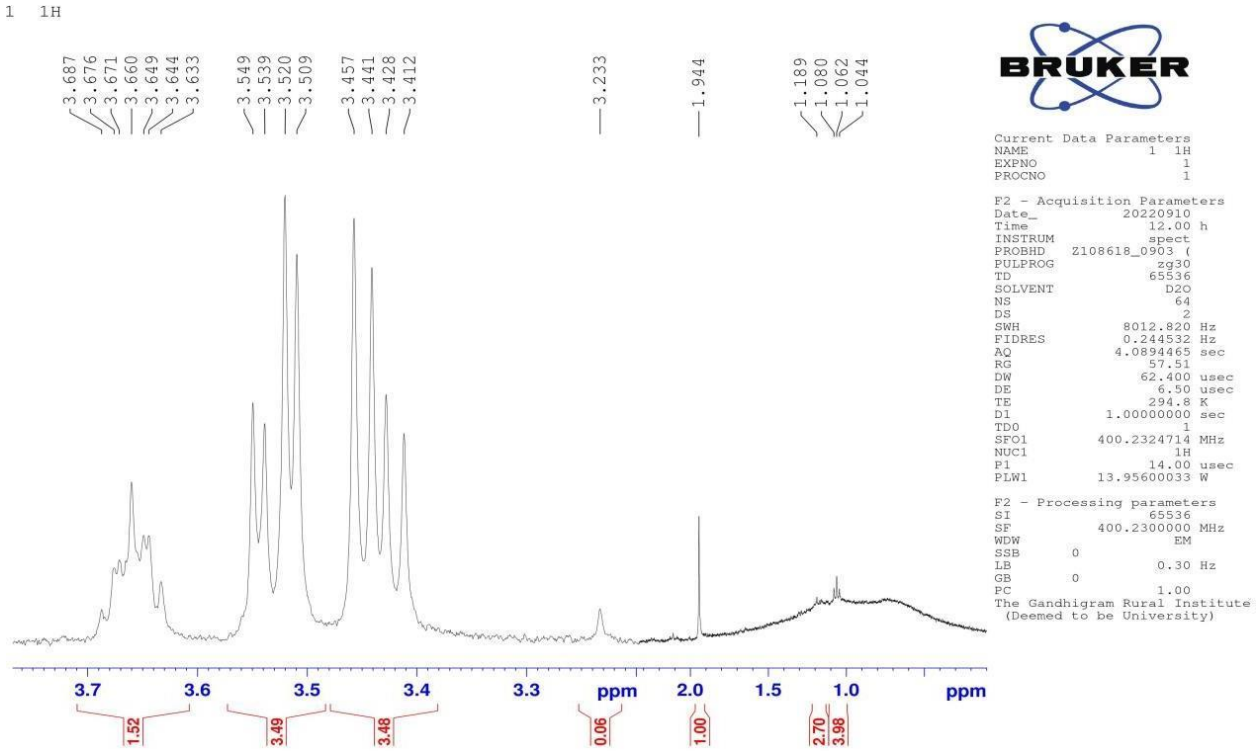
Table-1

S.No	Spectrum	Peaks	Compounds
1	Ultra Violet (wave Number cm-1)	i) 250 nm ii) 300 nm iii) 400 nm iv)700 nm	Poly-Unsaturated and aromatic yellow to green appearance (Toluene) Blue Green (N=O)
2	Infra Red (wave length cm-1)	(i)3403.74 cm-1	O-H Stretch (alcohols, Phenols)

		ii) 2919.7 iii) 1687.41	C-H Stretch (alkanes) C=O Stretch (carbonyls) O-H Stretch (Phenol)
3	HNMR (wave number TMS)	(i)2.007 to 2.786 ii) 3.4 to 3.5 iii) 3.6 to 3.7	Carbonyl (alpha hydrogen) Ether (R-CH2-OR) Alcohol (R-CH2-OH)2

NMR Measurements

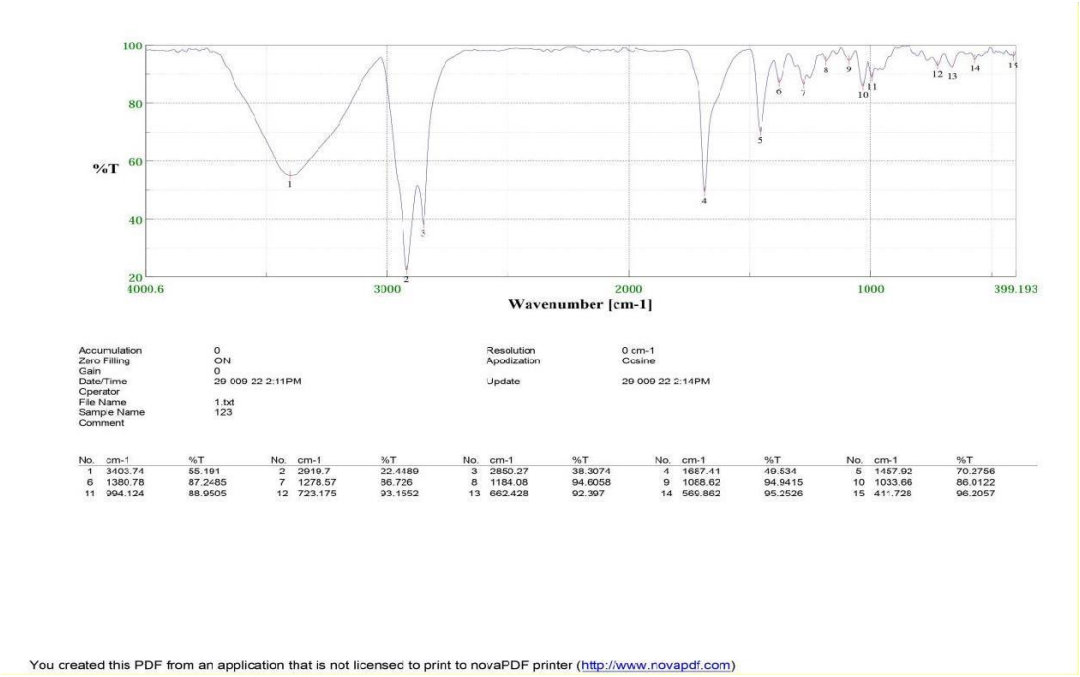
NMR Spectra were recorded on a Bruker AV-400 NMR and DMX 600 spectrometor operating at a proton NMR frequency of 400.2300000 MHz and 600.13 MHz respectively.For each sample, 128 scans were recorder with the following parameters: The spectra were referenced to residual solvent signal of D2O for EtOH extract and TSP at 0.00 ppm for water extract.



Spectrum: 1, olefinic signals of fatty components or terpenoids; 2, OCH3 of C-11 of vindoline; 3, OCH3 of C-22 vindoline.

IR Measurements

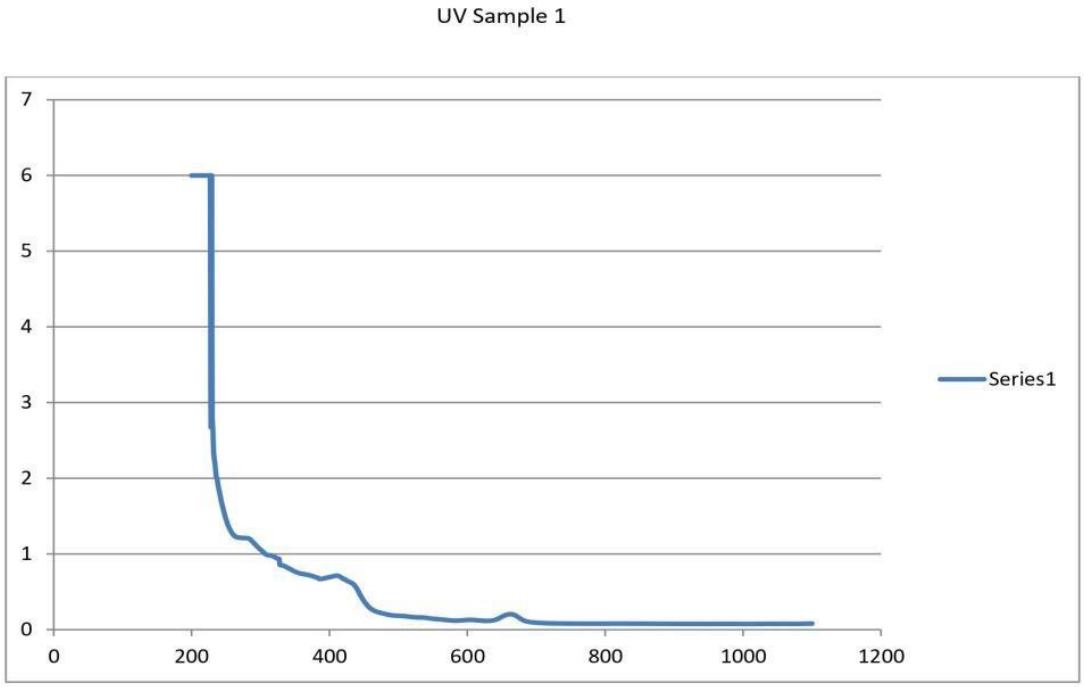
IR spectra were recorded on datas in wavelength of 4000.6 cm-1 to 399.193cm-^{1}. Comparision of these spectra with those of several other Vinca rosea alkaloids, notably catharanthine and vindoline, clearly indicated a close interrelationship between these compounds.



Spectrum: 2, Methoxy group (H3Co), 2, Acetoxy group components (-OCOCH3), 3, Aromatic compound C-H, 4, double bond stretching in secondary amine

UV Measurements

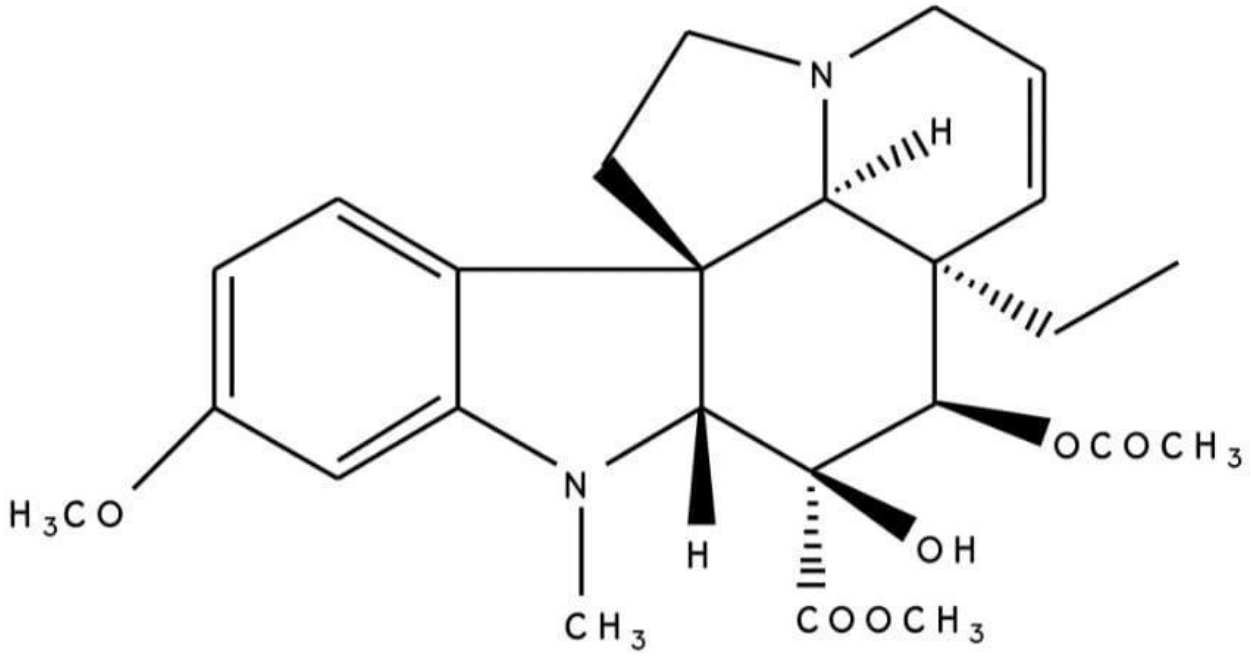
UV-Visible spectrometer were recorded in wave number(CM-1).(UV-vis spectrophotometer, modal UV-1800).UV-visible spectra was analysis of data taken as Wave number of (700CM-1 and 400CM)



Spectrum:3, (200 cm-1) poly unsaturated and aromatic (C=O, H-CH=O), 2, (400 cm-1)
Violet visible light uv rays, 700cm-1 of colour of absorbing in blue and green (N=O, N-->N *

STRUCTURE

For the identification of indole alkaloids of vindoline and fatty components, the signals of *catharanthus roseus* flower in spectra analysis of ethanol extract find out the compound of vindoline.



Vindoline

Medical uses of Vindoline

❖ Alkaloids that are isolated from *C. roseus* are found to be hypotensive, sedative and possess tranquilising and anti cancerous properties. Traditionally, the plant has been used for relieving muscle pain, depression of the central nervous system and wasps stings. It is used in the cases of nose bleed, bleeding gums, mouth ulcers and sore throats. It has also been used internally for the treatment of the loss of memory, hypertension, cystitis, gastritis, enteritis, diarrhoea and the raised blood sugar levels.

❖ It's application ranges widely from the prevention of cancer,cancer treatment, antidiabetic, stomachic etc. *Catharanthus roseus* was the highly exploited and studied medicinal plants as it was found to produce more than 100 monoterpenoid indole alkaloids (MIAs) that26 includes the two major commercially important cytotoxic dimeric alkaloids that are used in the cancer chemotherapy.

❖ *C. roseus* was also found to be a good source of the non-enzymatic and enzymatic antioxidants. From the Traditional period itself, the plant has been used to cure diabetes and high blood pressure as it was believed to promote the insulin production or to increase the body's usage of the sugars from the food in case of diabetes.

❖ *C. roseus* was found to possess a large number of chemicals in the alkaloid class. Alkaloids are the bitter-tasting plant compounds that contains mostly of nitrogen many of them was found to possess pain relieving or the anticancer properties. Especially two major alkaloids in C. roseus such as vinblastine and vincristine was developed into the prescriptions for the anticancer drugs. These injectable drugs and

its derivatives such as vinflunine acts in several pathways and was found to interfere with the division of the cancer cells.

❖ Catharanthus roseus L. is found to be an important source of the indole alkaloids that are present in all plant parts. The plant has been used for the treatment of diabetes, fever, malaria, throat infections, chest complaints, regulation of menstrual cycles and as a euphoriant. The physiologically important antineoplastic alkaloids such as vincristine and vinblastine are present in the flower and the antihypertensive alkaloids are found in the roots such as various types of lymphoma and leukemia.

CONCLUSION

The bacteria Aspergillus niger was mostly inhibited by ethanolic extract of flower of *Catharanthus Roseus*. The extract was showed most potent activity against Aspergillus niger bacteria. The alkaloid class of compound was identified and isolated. This alkaloid is vindoline find in flower of *catharathus roseus*. This Vindoline is may be cause for the treatment of various type of cancer in medicine. The ethanolic extract of flower was showed potent antibacterial of antiviral activity. The extract of the alkaloid compound will be helpful in future research.

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