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E: ISSN NO.: 2349-980X **Shrinkhla Ek Shodhparak Vaicharik Patrika**

Phytochemical Importance of *Catharanthus roseus* as A Source of Anticancer Agent

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Abstract

Catharanthus roseus also known as "The Madagascar periwinkle" is an important medicinal plant belongs to Apocynaceae family has anticancer properties. In the present study an attempt was made to investigate the phytochemical analysis and anticancer activity of extract of *Catharanthus roseus.*

The *C. roseus* extracts has levels of the anticancer activities. The leaves of *C. roseus* showed good phytochemical importance. The phytochemical analysis of the *C. roseus* shows the presence of alkaloids, terpenoids, steroids, flavonoids and other plant secondary metabolites.The alkaloids like Vinblastine (vincaleucoblastine) and vincristine (leurocristine) are main compounds present in *C. roseus*, which are used in treatment of various human cancers, like lymphatic cancer, leukemia cancer so it is considered as miracle in cancer chemotherapy.

Keywords: *Catharanthus roseus*, Phytochemical, Anti-Cancer, Vinblastine and Vincristine.

Introduction

Medicinal plants contain some organic compounds which provide definite physiological action on the human body because of presence of various bioactive substances such as tannins, alkaloids, carbohydrates, terpenoids, steroids and flavonoids (Paikara *et. al,* 2015). *Catharanthus roseus* is an important plant of Apocynaceae family. It having an anticancer properties (Jaleel *et. al*., 2009).The anticancer alkaloids Vinblastine and Vincristine are derived from stem and leaf of *Catharanthus roseus*. These alkaloids have medicinal value which helps in prevention of cancerous cells growth.Vinblastine and Vincristine are some special alkaloids having chemotherapeutic properties used for inhibiting the growth of cancereous cells and used for the treatment of metastatic testicular cancer, Hodgkin's lymphoma, Kaposi's sarcoma and carcinoma of the breast.

Fig 1: *Catharanthus Roseus*

Phytochemical Analysis

Phytochemicals are basically special type of chemicals present in various medicinal plants and used for the treatment of various disease. On the basis of their function phytochemicals are divided in two groups that are primary and secondary metabolites. Primary metabolites comprise of amino acids, fats, proteins, whereas secondary metabolites alkaloids, flavonoids, and tannins. By the phytochemical screening process of

different crude plant extracts shows the presence of different secondary metabolites for example saponins, flavanoids, tannins, etc.

Extraction and Isolation

The dried leaf materials were washed air-dried at room temperature (26°C) for 2 weeks, after which it was ground to a uniform powder. The dry powder was extracted by reflexed in 100 mL methanol for 24 h. Whatman filter paper, No. 1 is used for filtering of the plant extract. The filtrate was then evaporated and dried at 55°C. Ethanol and distilled water extracts are obtained and all the extracts are preserved. The dried extract which we obtained from the above process stored at 20°C in labelled sterile bottles.

Qualitative Phytochemical screening

Catharanthus roseus with petroleum ether extract were subjected to various qualitative tests for the identification of plant constituents.

Qualitative Analysis of Phytochemicals

Phytochemical Test	Result
1. Test for Alkaloid 1.0ml of plant extract was taken and then 1.0 ml of saturated solution of picric acid was added to plant extract	Yellow colour appears
2.Test for Tannins Take 0.5 g of the plant extract and boiled in 10 ml of water in a test tube and then filter it. And add few drops of $FeCl_3$	Brownish green or blue- black
3 Test for Saponins 1g of plant extract added in 5ml of distilled water in a test tube. The solution was stirred. Then 3 drops of olive oil was mixed and shaken vigorously. Also add H_2SO_4	Stable persistent froth appears. Formation of an emulsion
4 Test for Cardiac Glycosides 0.5g of extract was diluted to 5 ml in water was added 2 ml of glacial acetic acid containing one drop of FeCl3. This was under laid with 1 ml of conc. H_2SO_4	A brown ring at the interface. A violet ring was appeared next to the brown ring. Greenish ring may form just above the brown ring.
5 Test for Tarpenoids 5 ml of test material was mixed with 2 ml of chloroform and 3 ml of conc. H_2SO_4 was added to form a layer.	A reddish brown coloration of the interface was formed.
6 Test for Phenol Take 2 ml of plant extract and add 2 ml of Folin's reagent	Appearance of violet or brown colour.
7 Test for Flavonoids Take test material and add 5 ml of ammonia solution followed by addition of conc. H_2SO_4.	Yellow colour appears
8. Test for Carbohydrates 10 ml H2O was added in 2 ml of extract and 2 drops of ethanolic α-naphthol were added which was followed by addition of 2 ml of conc. H_2SO_4.	Reddish violet ring at the junction appears.

Table 2: Phytochemical Evaluation of *Catharanthus roseus*

S.No	Phytochemical	Results
1	Tannins	+
2	Cardiac Glycosides	+
3	Alkaloids	+
4	Flavanoids	+
5	Carbohydrate	-
6	Terpenoids	+
7	Proteins	-
8	Saponins	+

Anticancer Properties of *Catharanthus Roseus*

The alkaloids such as Vinblastine and Vincristine which derived from *Catharanthus roseus* having medicinal values and these show inhibition effect on some human cancers. Vinblastine is used for treatment of metastatic testicular cancer, Hodgkin's lymphoma, Kaposi's sarcoma and carcinoma of the breast. Vincristine another important alkaloids is used for treatment of skin and blood cancer. Plant extracts of *Catharanthus* shows the significant anticancer activity against various cancer. Vinblastine is also named as Velban and Vincristine as oncovin.

Fig 2: Vinblastine

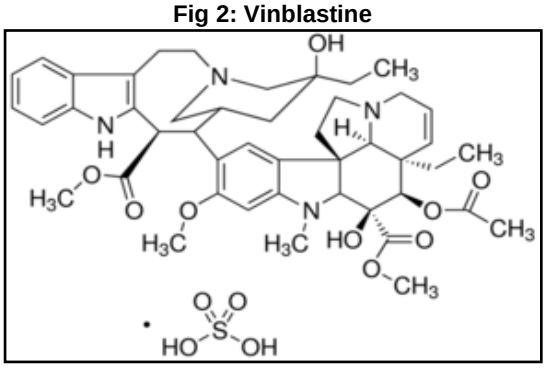
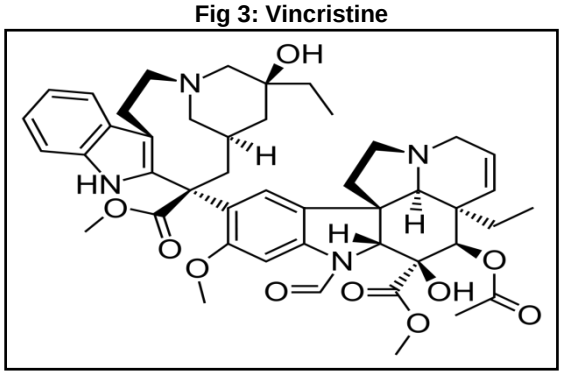


Fig 3: Vincristine



Conclusion

Various medicinal plants were being investigated for their medicinal value. There is presence of thousands of phytochemicals in medicinal plants which is used for the estimation of plants medicinal value .Above study showed Phytochemical analysis of *Catharanthus roseus* indicated the presence of tannins, alkaloid, flavonoid, terpenoid and glycosides.

These phytochemicals are biologically active compounds found in medicinal plant parts which are precursors for clinically useful drugs .The potency of medicinal plants is attributed to the action of the phytochemical constituents. These are actually produced by plants as secondary metabolites in response to environmental pressure or as a defence mechanism *Catharanthus roseus* contains alkaloids such asvinblastine, vincristine. Vincristine is used as the chemotherapeutic agent for Hodgkin'slymphoma, while vinblastine is used for childhood leukemia. Vinblastine is used for treatment of metastatic testicular cancer, Hodgkin's lymphoma, Kaposi's sarcoma and carcinoma of the breast. Vincristine another important alkaloids is used for treatment of skin and blood cancer.

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