Phytochemical Potential of Vinca rosea

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Abstract

This research aims to tell about what phytochemicals are present in *Vinca rosea.*

The attempt of this review reveals that *Vinca rosea*, many naturally grown plants around us which may be used for medicinal purposes. *Catharanthus roseus Linn* is a perennial plant that is mostly found in southern Asia, tropical countries and are native to Madagascar *Catharanthus roseus L*. has many common names like *vinca rosea*, Madagascar periwinkle, bright eyes, Cape periwinkle, graveyard plant, old maid, pink periwinkle, rose periwinkle myrtle. *Vinca* is one of the most available plants and it has the life-saving property.

Most of the trending disease is cancer, *vinca* has the anti-cancer and the anti-tumor properties mostly the at the later stage only cancer is been detected. there will be a failure in the treatment due to the late diagnosis. if the cells are been identified in the body then only the cancer cure is possible. Like vinca, there are many plants that may have anti-cancer properties. As synthetic drugs have many side effects but we also have traditional medicine like vinca which is been used from ancient times.

Keywords: *Vinca rosea*, Tropical countries, Phytochemical properties

Introduction

Catharanthus roseus, commonly known as *Vinca rosea*, is a commonly cultivated woody herb characterized by large pinkish to red flowers.

Due to their outstanding pharmacological properties, *Vinca* alkaloids (which are derived from the Madagascar periwinkle plant), have attracted a lot of interest in the fields of medical chemistry and pharmacology.

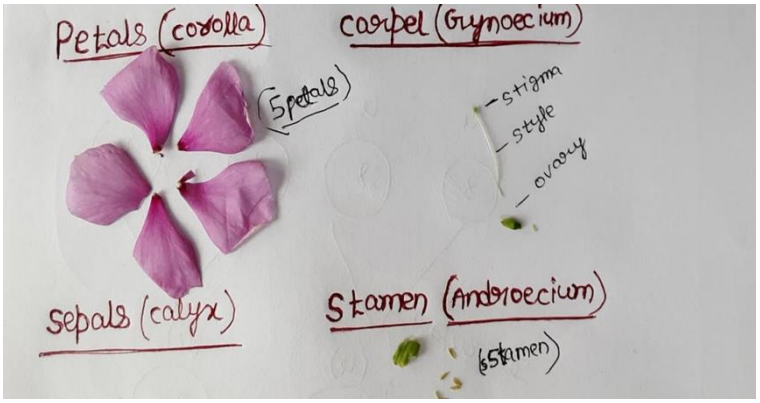
They are being Extensively investigated for many years.

The Madagascar periwinkle, known for its lustrous green foliage and vivid pink or white blooms, is indigenous to Madagascar but has been globally grown for its decorative allure and therapeutic properties.

The origins of *Vinca* alkaloids are done by indigenous societies that have long been using extracts.

Botanical Classification

Taxonomic Rank	Classification
KINGDOM	PLANTAE
DIVISION	Magnoliopsida (Flowering plants)
CLASS	Magnoliopsida (Dicotyledons)
ORDER	Gentianales
FAMILY	Apocynacea
GENUS	*Cathranthus*
SPECIES	*C.Roseus*



Applications

1.*Vinca rosea* (*Catharanthus roseus*), also known as Madagascar periwinkle, has significant applications in oncology, traditional medicine, and agriculture.

2. The plant is the primary source of vinca alkaloids, specifically vincristine and vinblastine, which are critical chemotherapeutic agents.

3. Extracts are used in Ayurveda and traditional systems to manage diabetes (hypoglycemic effects) and hypertension (ajmalicine is an approved antihypertensive agent).

4. Recent studies highlight its potential as a natural antifungal agent against wheat pathogens like *Fusarium graminearum*.

5. It is useful in treating gastritis, cystitis, enteritis, diarrhea, diabetes etc. when taken internally. The *vinca rosea* plant ensures brain health. It's natives ingredients improve blood supply to the brain, increase the level of oxygen that the brain can utilize.

Materials and Method

Multiple techniques were used (maceration, sonication, Soxhlet extraction) to prepare extracts, here we have used maceration method and their phytochemical screening was done to analyze different bioactive compounds, showing the presence of alkaloids, phenols, flavonoids, tannins, and saponins as bioactive compounds in this plant.

Plant Extraction Method

To deduce antifungal properties of *Vinca rosea* plants, it is very necessary to extract chemical components of our interest.

Step1- Includes a preliminary washing, drying, and crushing of leaves in the process for obtaining equivalent sample. During the extraction procedure, all the potentially active components must be maintained.

Step2- The plant material petals of *Vince rosea* were brought, then dried it under shade and by using mortar and pestle dried leaves were crushed to form a powder and stored in an air tight plastic container until used.

Step3- Using Maceration extraction method respective extracts were obtained. Then concentrated to dryness, residues obtained were preserved at 4ºC. For further in-vitro studies of antifungal activity these extract were used.

For testing the potential of medicinal plants sample were prepared in polar solvent methanol.

Maceration Method:

Dried leaf powder (50 g) is soaked in 100 mL of a polar solvent (e.g., methanol) and kept at room temperature for 72 hours with occasional stirring. The mixture is then filtered using Whatman filter paper no. 2, and the solvent is removed under rotary evaporation to obtain the crude extract.

The nutritional value of Sadabahar (*Catharanthus roseus*) leaves is listed below:

Macronutrient	Value
Energy	354 Kcal
Protein	5.2 gram
Fat	3.3 gram
Fibre	2.4 g
Calcium	340 mg
Iron	27 mg
Vitamin C	0.02 mg

Beside these macronutrients, the leaves and flower petals are rich in flavonoids, alkaloids, carbohydrates, and phytochemicals such as vincristine, vinblastine, and vindesine.

Phytochemicals present in *Vinca Rosea*

Vinblastine - Vinblastine, sold under marketed brand *Velban* is a chemotherapy medication. It is used to treat various variety of cancer includes non-small cell respiratory organ cancer, Hodgkin's malignant neoplastic disease, bladder cancer, brain cancer, seminoma and malignant melanoma. It is administered by injection into a vein.

Vincristine- Vincristine is also called Leurocristine and sold under brand name *Oncovin* and is used in chemotherapy. It is used to treat different types of cancer. These include acute lymphocytic disease, small lung cancer etc.

Vindesine- Vindesine is sold under brand name *Eldisine*. Vindesine is a semi-synthetic vinca alkaloid chemotherapy agent. It is used in treatment of breast cancer, lymphomas etc. It functions as a microtubule inhibitor.

Vindoline- Vindoline is a chemical precursor of Vinblastine. Vindoline is formed through biosynthesis from Tabersonine.

Phytochemical Analysis

Phytochemical analysis refers to the testing of chemical compounds, known as phytochemicals, obtained from plants, mainly focusing on the detection and quantification of various secondary metabolites through specific screening methods.

Test for Alkaloids

To test for alkaloids, combine 1.0 ml of the extract with 2.0 ml of concentrated hydrochloric acid, followed by a few drops of Mayer's reagent. the formation of yellow precipitates indicates the presence of alkaloids.

Test for Amino acids

For amino acid identification, 2.0 ml of extract is treated with 2% copper (ii) sulphate drop and 1.0 ml of 95% ethanol. adding excess potassium hydroxide pellets results in a pink layer in the ethanol solution, confirming the presence of amino acids.

Test for Carbohydrates

To detect carbohydrates, boil 1.0 ml of the plant extract with 1.0 ml of each of Fehling's solutions A and B. the presence of carbohydrates is confirmed by the formation of a red precipitate.

Test for Flavonoids

Add 2.0 ml of dilute sodium hydroxide to 1.0 ml of extract to test for flavonoids. adding 3.0 ml of dilute hydrochloric acid turns the yellow solution colour less, indicating flavonoids.

Test for Glycosides

Glycosides were detected by adding 1.0 ml of extract to 2.0 ml of chloroform and 2.0 ml of concentrated sulphuric acid. a reddish-brown ring indicates glycosides.

Test for Phenols

Add 3–4 little drops of ferric chloride to 2.0 ml of the extract for phenols. a dark green colour signifies the presence of phenols.

Test for Tannins

Detect tannins by treating 2.0 ml of extract with 10% alcoholic ferric chloride solution. the appearance of a dark blue or greenish-grey colour indicates tannins.

Test for Terpenoids

Mix 1.0 ml of extract with 1.0 ml of chloroform and layer with concentrated sulphuric acid for terpenoids. a reddish-brown interface indicates terpenoids.

Test for Cardiac glycosides

Mix 5.0 ml of the extract with 2.0 ml sodium picrate reagent to test for cardiac glycosides. a yellow-orange colour indicates their presence.

Conclusion

Catharanthus roseus is highly used for its abundant phytochemical composition and powerful anti-cancer properties, making it a significant player in the field of cancer therapy.

The breakthrough in *vinca* alkaloids from *Catharanthus roseus* has brought about a significant advancement in cancer treatment.

These powerful chemotherapeutic agents have proven to be highly effective in combating various types of malignant.

This plant extract contain various phytochemicals which are not only helpful in treatment of cancer but are used in treating anti-fungal, gastric problems, anti-microbial diseases etc.

Future Aspects:

Vinca rosea (Madagascar periwinkle) attains significant future potential as a sustainable, multi-purpose resource in pharmaceuticals, agriculture, and environmental remediation.

This approach aims to maximize therapeutic efficiency and minimizing any potential toxicity.

Exploring new possibilities in research involves studying and understanding the unique properties of bioactive compounds found in *Catharanthus roseus* that have shown potential in fighting cancer.

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