

**A REVIEW ON PHARMACOLOGICAL ACTIVITY OF
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• ABSTRACT

Nature had donated the most valuable thing that is lots of medicinal plant. Medicinal plant is very important and widely available resources for primary healthcare and complementary system. An Ayurveda consulate that any one part or almost whole plant which used as medicine, in that one which catharanthus roseus family Apocyanaceae, discovered by Scottish botanist "George Don" contain 200 important alkaloids its around eight known species widely found elsewhere and ornamental places in garden it show anti-tumor activity. Cancer is abnormal growth of cells in anywhere in the body begin to divide uncontrolled. There are 200 different known cancers which affect the human. uncontrolly growth occurs in solid tissue. In Chemotherapy anti-cancerous drug which treat tumor but they have side effect if not limited usages that's why use of plant sources for anti-cancerous start in 1950 and then discovery of catharanthus roseus (vinca alkaloid)

vinblastine as an anti- cancerous agent.

• **KEYWORD:-** Catharanthus rose us, Anti-tumor, Subs herb.

- **INTRODUCTION**

Catharanthus roseus is an evergreen and herbaceous plant. The word Catharanthus roseus derives from Greek language meaning “Pure Flower” is commonly known as “Bright Eye” and English known as “Periwinkle”.^[2]

It grows in semi-shade (light woodland) or non-shade up to 39 inches 1 m throughout all the season that's why is known as “Sadhaphuli” in Marathi. It has a well-drained soil, warm temperature (20-30°C) and full sun is required if the temperature will be below the 5°C whole plant die. It blooms throughout the year in tropical condition pollinated by butterflies and moths. It widely naturalized in subtropical, tropical areas around the world.^[2,5]



Catharanthus roseus flower.

- **Species^[2]**

- 1) Catharanthus coriaceus
- 2) Catharanthus lances
- 3) Catharanthus langifalius
- 4) Catharanthus ovals
- 5) Catharanthus pastilles
- 6) Catharanthus roseus
- 7) Catharanthus stimulus
- 8) Catharanthus trichophyllus.

- **Scientific classification^[3]**

Domain	Eukaryotes
Kingdom	Plantae
Sub Kingdom	Tracheabionta
Davison	Magnoliophyta

Class	Magnoliosida
Order	Gentianales
Family	Apocynaceae
Sub family	Rauvolfioideae
Tribe	Vinceae
Genus	Catharanthus G. Don
Plant form	Herb, subshrub
Plant Type	Annual perennial
Botanical name	Catharanthus roseus

- **Appearances of catharanthus roseus**

- Leaves are oval to oblong broad, glossy and green up to 2.5-9 cm broad arranged in opposite pair.
- Flower have a five petal like lobes it look likes white to dark pink with darker red center, the basal tube 2.5 cm long and corolla 2.5 cm broad.
- Petiole is 1-1.8 cm long.^[11,12,13,14]



Catharanthus roseus growing plant.

Chemical constituent

- Linoleic acid ethyl ester (43.3 %)
- Steric acid (10.6%)
- Photo (7.3%)

In modern study Microwave Assisted Extraction (MAE), Soxhlet Extraction method used for extraction purpose as compared to Soxhlet Extraction (MAE) is more efficient for extraction of **Vinblastine** with the help (HPLC) High Performances Liquid Chromatography.^[6]

- Method for extraction

Collect the leaves and dried under shade and finely grounded, weight 1g of *Catharanthus roseus* powder, place in vial each time



Weigh 10 ml solvent (Ethanol, water) added in a beaker + 1g of powder + 0.2 ml HCl covered with polythene bag to avoid evaporation.



Placed at different power like 500W, 700W, 900W and time series arranged from 30sec, 60sec, 90sec.



Solvent (Ethanol, Water) used separately for extraction



Extract is placed in pre-weighted vials each time. keep under fan for drying



A dry extract store at 4C fridge for phytochemical screening.

Table no. 1: Extraction of *Catharanthus roseus* leaves by using microwave assisted extraction at different Power and Time.

Sr. no	Time factor	Power(W)	Weight of extract
1	30	500	0.39
	60		0.31
	90		0.28
2	30	700	0.31
	60		0.25
	90		0.17
3	30	900	0.43
	60		0.20
	90		0.16

Microwave Assisted Extraction of *Catharanthus roseus* produced maximum (0.43g) extract per gram of plant while using lesser time of extraction (30) sec in 900W.

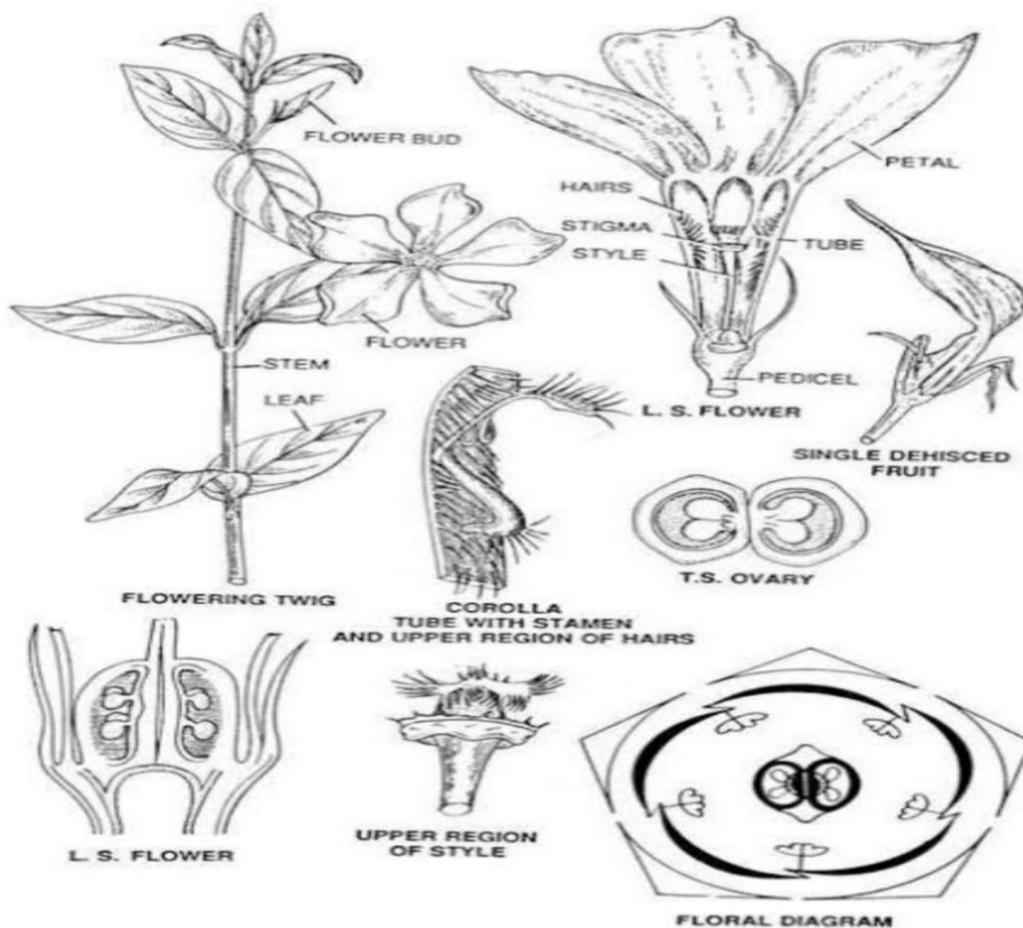


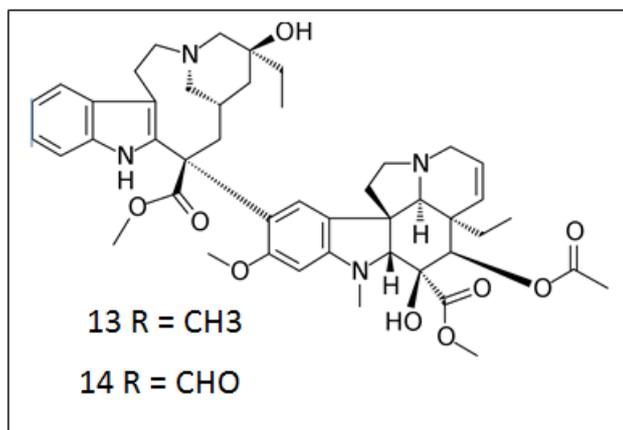
Fig. 19.1. Apocynaceae. *Lochnera rosea*; Syn. *Vinca rosea* Linn.

Diagram of catharanthus roseus

Table no. 2: Qualitative analysis of phytochemical s.

Phytochemical	Chemical test name	Observation	Result
Alkaloid	Mayer’s reagent	Yellow colored precipitated	Positive
Flavonoids	Shined test	Pink scarlet color	Positive
Anthraquinone glycoside	Borntragers test	Red color in ammonia layer	Positive
Terpenoids	Salkawski test	Reddish brown coloration at the interferences	Positive
Steroid	Liebermann’s reaction	Blue color	Positive
Carbohydrate	Mulish test	Reddish violet ring at the junction	Positive

Catharanthus roseus commonly known as Vince Alkaloid is initially extracted from the Catharanthus roseus, sometime called Catharanthus alkaloid plant contain 190 alkaloids including “ **Vinblastine** “ which treat Cancer.^[8,9,10,11]

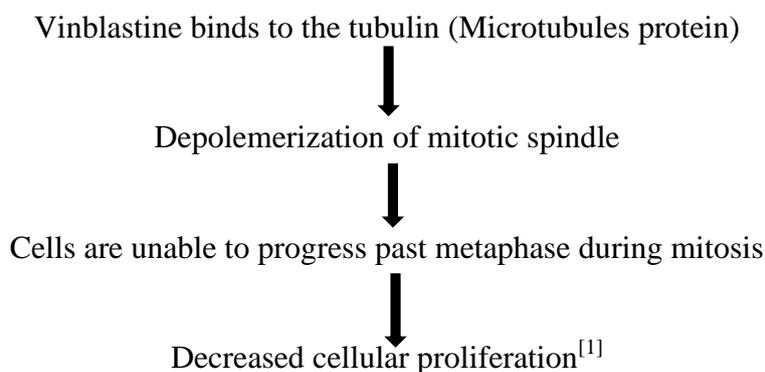


- **Structural activity relationship (SAR)**

- Heterocyclic or aryl compound decreases the activity of drug
- Charged group or strongly polar group decreases the activity.
- If polarity of the substituent decreases then produces more active Analogues of the drug.
- The lipophilic linker such as thither introduces which can Restore the activity of the drug.
- Small and unchanged molecules can increase the activity and show the best result.^[2]

- **Mode of action**

Vinblastine is anti-tumor drug. which used in chemotherapy that act on the metaphase of mitotic cell and arrest the metaphase.^[4,5]



- **Pharmacological activity**

Cathranthus roseus are used as an essential oil extracted by stem distillation from flower and leaves. Catharanthus roseus which potent medicinal plant shows various pharmacological actions such as anti-cancer, anti-diabetic, anti-microbial anti-diarrheal activity. It also shows anti-oxidant, anthelmintic, anti-feedant, anti-sterility activity.

- **Anti- cancers activity**

Cancer is an abnormal and uncontrolled division and growth of cells. Than form a tumor and invades adjacent tissue Cancer can be treated by radiation, surgical intervention, chemotherapy. In chemotherapy treat whole body is used in combination with surgical or radiation to ensure all tumor are removed. The anti –cancer alkaloid vinblastine derived from leaves and flower of *C. roseus* these alkaloid have growth inhibition effect t to human tumor, is used experimentally for treatment of neoplasm.

- **Anti-diabetic activity**

Vinca roseus have good anti- diabetic activity the leaves of *Catharanthus roseus* potentially used in various regions in the world including India, for healing of diabetics mellitus. Leaf and other part of *C.roseus* also used for the treatment of diabetes^[22] in earlier report extract indicate lowering blood glucose level inhibiting glucose 6 –phosphate dehydrogenase^[7] Alcoholic extract of *vinca roseus* show anti-hyperglycemia activities without change in body weight and improve the condition of Diabetes Mellitus as well as show regeneration of beta cell . *C.roseus* changed the action of insulin in tissue & release of insulin, glucose and uptake of glucose is very essential to throw light on its anti-diabetic activity. Improves glycaemia control by enhancing Insulin sensitivity in liver and muscle decrease HDL- cholesterol elevated total cholesterol in diabetic group. High dose (500mg/kg) is more effective as compared to low dose (300mg/kg) of methanol whole plant extract after 14 days treatment. And also effect than standard drug that's "gilbenclamide" (5mg/kg).

The action of this extract on pancreatic beta cell where acute toxicity may offer a new hope to the diabetics in future.

- **Anti- Microbial activity**

Vinca roseus shows anti-microbial activities against pathogenic bacterial strains *Bacillus subtilis*, *B. Licheniformis* & *Azobacter S.P* for this used agar well diffusion method and to determine minimum inhibitory concentration (MIC) of different plant extract against Gram negative (*Escherichia coli*) *Salmonella enteritidis* & Gram positive bacteria (*Bacillus Cereus*, *Staphylococcus Aureus*) also, to carried out the screening of this plant for which part to be shows anti- microbial activities. Methanol extract of in vivo leaf, in vitro leaf used and exhibited anti-microbial activity but in vitro extract showed better result as compared to in vivo extract. extract of different part of *C. roseus* (Leaf, Flower root, Stem) used but all this

extract did not show anti- microbial activities further root extract against staphylococcus aureus which also shows broad spectrum anti- microbial activity against Salmonella typhi and S. bodydil. Bacterial resistances to antibiotic is major therapeutic problem to overcome this scientist search toward the herbal medicine.

- **Anti-diarrheal activity**

Ethanol extract of *Catharanthus roseus* possesses anti- diarrheal effect and corroborate the use of this herbal remedy for treatment of diarrhea in folk medicine this extract was tested in the waster rat with castor oil as an inducing agent in experimental diarrhea *C.roseus* extract containing phytochemical tannins and flavonoids are present which is responsible for anti-diarrheal activity by increasing electrolyte reabsorption and colonic water. *C. roseus* showed the dose dependent inhibition of the castor oil induced diarrhea at the dose of 200-500 mg/kg.^[52]

- **Dose**

- 1mg/ ml for injectable solution
- 10 mg powder for injection

- **Market preparation**

- Vinblastine sulfate injection 1mg/ml

- **CONCLUSION**

Catharanthus roseus shows rich medicinal plant pharmacologically it prove that flower and leaves of this plan have pharmacological activities. This plant are found in India, Austria, Malaysia, Pakistan, Bangladesh, as compared to standard drug the leaf extract are sensitive to the cancer cells. This vinca alkaloid extracted by using Microwave Assisted Extraction.

Catharanthus roseus Vinca alkaloid (**vinblastine**) which damage the microtubules thus it shows anti- tumor activity in addition it used to treat Hodgkin lymphacima, acute leukemia in children, Will's tumor also.

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