

Review on Vinca : *Catharanthus Roseus*

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Abstract: *Ayurveda is a conventional Indian medicine system focused on the power of herbal medicine. Catharanthus roseus is a well-recognized plant in Ayurveda. It is known for its antitumor, anti-diabetic, anti-microbial, anti-oxidant and antimutagenic effects. It is an evergreen plant that originated on the islands of Madagascar. The flowers can vary in color from pink to purple and the leaves are arranged in opposing pairs. It produces about 130 alkaloids mainly ajmalcine, vinceine, resperine, vincristine, vinblastine and raubasin. Vincristine and vinblastine are used to treat various types of cancer such as Hodgkin's disease, breast cancer, skin cancer and lymphoblastic leukemia. It is an endangered species and needs to be preserved using techniques such as micropropagation. It has high therapeutic value that needs to be considered in more detail.*

Keywords: Alkaloids, Catharanthus roseus, vinblastine, vincristine, micropropagation.

I. INTRODUCTION

There are many natural plants around us that can be used for medicinal purposes. Among those Catharanthus roseus is the date palm found throughout the tropics. Catharanthus roseus linn is a perennial herb found in sothern Asia, tropics and native Madagascar, catharanthus roseus L. has many common names such as vinca rosea, madagascarperiwinkle, brig: Ayurveda is a common form of Indian medicine. focused on the power of herbal medicine. Catharanthus roseus is a well-known plant in Ayurveda. It is known for its antitumor, anti-diabetic, anti-microbial, anti-oxidant and antimutagenic effects. It is a evergreen plant native to the islands of Madagascar. The flowers can vary in color from pink to purple and the leaves are arranged in opposing pairs. It produces about 130 alkaloids mainly ajmalcine, vinceine, resperine, vincristine, vinblastine and raubasin. Vincristine and vinblastine are used to treat various types of cancer such as Hodgkin's disease, breast cancer, skin cancer and lymphoblastic leukemia. It is an endangered species and needs to be preserved using techniques such as micropropagation. It has a high therapeutic value that needs to be considered in detail. ht eyes, Cape periwinkle, graveyard plant, old maid, pink periwinkle, rose periwinkle myrtle. Kemunting Cina is a local name in Malaysia. The oldest group of alkaloid groups in the plant that treated cancer were vinca alkaloids [3]. The milk-producing vinca rosea stem contains a source of more than 70 indole alkaloids. Among them are two anti-neoplastic compounds found in the extracts of vinblastin and vincristine. For Hodgkin's lymphoma, vincristin is used as a chemotherapeutic regimen and in pediatric leukemia, vinblastin is used. Vinca alkaloid inhibits metaphase cellular mitosis and its most serious side effects are peripheral neuropathy, hair loss, hyponatremia and constipation Mainly used for high blood pressure, diabetes, leukemia, malaria, minor lung cancer, Hodgkin's lymphoma, improves memory. It also has antimicrobial activity, antioxidant activity, anti-diarrheal activity, hypolipidimic activity and wound healing function.

- HABIT- A Perennial herb
- STEM- Erect, Cylindrical, Branched, Solid, Reddish Green, Glabrous
- ROOT- Tap root, rarely branched.
- LEAF - cauline, simple, opposite, decussate, petiolate, exstipulate, entire, mucronate apex, unicostate reticulate venation.
- INFLORESCENCE- cymose, flower arranged in axillary pairs.
- FLOWER- pedicellate, bractate, hermaphrodite, actinomorphic, complete, pink, hypogynous
- CALYX- 5, polysepalous, glandular, green, inferior, quinquecuneate aestivate.
- COROLLA - 5, gamopetalous, fringed corolla tube, throat of corolla tube hairy forming a corona, contorted aestivate



Fig. 1 vinca flower (*Catharanthus roseus*)

Taxonomy

- Kingdom : Plantae
- Division: Magnoliophyta (Flowering plants)
- Class : Magnoliopsida (Dicotyledons)
- Order : Gentianales
- Family : Apocynaceae
- Genus : Catharanthus
- Species : roseus
- Botanical name: Vinca Rosea
- Binomial name: Catharanthus roseus

Cultivation Principles

Catharanthus roseus prefers sunny and tropical conditions and is widely planted in fertile sandy areas where the sun shines to separate shade. The flower blooms during the summer until the snow appears. *Vinca minor* and *Vinca major* are evergreen plants for veining and propagated by cutting. The plant needs normal moisture but avoid over-watering. Seeds are produced in the plant 12-16 weeks before the final frost.

Morphology

Catharanthus roseus is a evergreen or herbaceous plant that grows up to 1 m tall. mude. The leaves are oval to oblong, 2.5- 9.0 cm. length and 1-3.5 cm. wide shiny green hairless with pale midrib and short petiole about 1- 1.8 cm. tall and arranged

Half life: in opposing pairs. The flowers are white to dark pink with a reddish-black center, with a basal tube about 2.5-3 cm. length and corolla approximately 2-5 cm. five-leaf wide as lobes. The fruit is a pair of follicles about 2-4 cm. length and 3 mm wide.

Anticancer activity of vinca

The antitumor activity of vincristine and vinblastine is thought to be mainly due to the inhibition of mitosis on metaphase by its interaction with tubulin. Disruption of tubulin / microtubule equilibrium with vinca alkaloids by vinca alkaloids After binding to vinca alkaloids, tubulin dimmers cannot bind to form microtubules. This effectively reduces the pool of free tubulin dimmers found in the microtubule assembly, leading to a change in equilibrium to disintegration.

Like other vinca alkaloid, Vincristin may also interfere with:

1. amino acid, cyclic AMP, glutathione metabolism,
2. calmodulin-dependent Ca^{2+} -transport ATPase activity,
3. cellular respiration, and
4. nucleic acid and lipid biosynthesis

Distribution dose: Within 15 to 30 minutes after an injection, more than 90% of the drug is spread from the bloodstream to the muscle, where it remains firm, but not reversed, bound.

Metabolism: Hepatic. Cytochrome P450 enzyme CYP3A subfamily facilitates vincristine metabolism.

Tract of elimination: The liver is a major organ that excretes feces from humans and animals. 80% of the injected dose of vincristine sulfate exceeds sewage. 10-20% is excreted in the urine.

When intravenously injected into cancer patients, a triphasic serum decay pattern was observed. The initial, middle, and terminal half-lives are 5 minutes, 2-3 hours, 85 hours respectively.

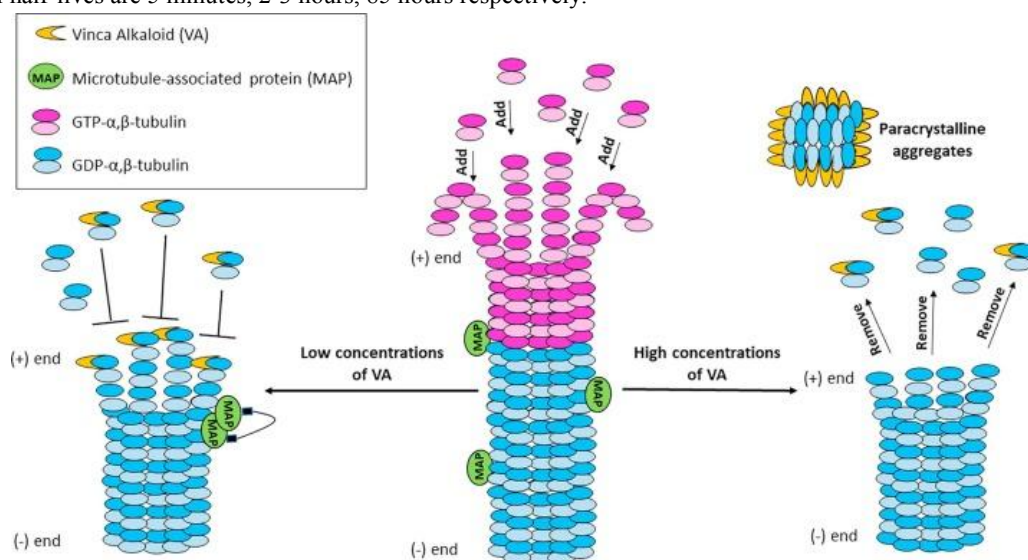


Fig. 2 mechanism of action

Antimicrobial activity of vinca

Raw extracts from different parts of the plant were tested for antibacterial activity. Extraction of leaves showed very high efficiency. The anti-bacterial activity of the leaf of the plant was tested against a microorganism such as *Pseudomonas aeruginosa* NCIM2036, *Salmonella typhimurium* NCIM2501, *Staphylococcus aureus* NCIM5021 and found that the extract could be used as a prophylactic agent in the treatment of many diseases.

Antioxidant Property

The anti-oxidant power of ethanolic extract from the roots of the two types of *C. roseus* i.e., *rosea* (pink flower) and *alba* (white flower) are obtained using a different test system such as Hydroxyl radical-scavenging activity, superoxide radical extraction function, DPPH-radical-scavenging activity and nitric oxide radical inhibition method. The results obtained confirmed that ethanolic extract from the roots of the *Periwinkle* species showed a satisfactory search effect throughout the assay in a concentrated but C-dependent manner. *roseus* was found to have more antioxidant activity than that of *C. alba*.

Anti-Diabetic Activity

Diabetes mellitus is a leading cause of death nowadays a large population depends on herbal drugs for curing of diseases. Several authors have reported that *Catharanthus rosea* was used for controlling diabetics. It has been reported that vinculin a plant derived natural remedy used for curing of diabetes was isolated from *C. roseus* which showed hypoglycemic activity and has been marketed commercially. Anti hyperglycemic activity is significantly showed by whole plant.

alcoholic extract at a (500 mg/kg) of high dose. Blood sugar level and the beta-cell number were reversed effectively due to extract of *C. roseus*. The phyto constituents responsible exactly for the antidiabetic effect were not yet known. Leaf and flower ethanol extract showed reduction in blood glucose and is comparable to the standard drug. Reduction of blood sugar is similar to the standard drug glibenclamide. In the liver hypo glycemic effect has observed due to the result of the enhanced glucose utilization. In laboratory animals it has been observed that leaf extract of *C. rosea* possess antihyperglycemic and hypo-tensive activity. The fresh leaf juice of *C. rosea* helps to reduce blood glucose levels in normal and alloxan diabetic rabbits. The hypoglycemic activity was observed after administration of leaves and twigs of *C. rosea* in streptozocin induced diabetic rats. Venter et al., studied that plant extract was used for stimulated glucose utilization in hepatocytes. Aqueous leaf extract of *C.rosea* showed hypolipidemic effects in alloxan induced diabetic rats. Muralidharan reported antidiabetic activity of dichloromethane extracts of leaves and twigs of *C. rosea* in streptozotocin (STZ) induced diabetic rat model.

Wound Healing Activity

Nayak et al., [63] reported that the ethanolic extract of *Catharanthus roseus* has healing properties when treated with injured rats and this area was due to the strong increase in strength and hydroxyproline content of granulation tissue. Supports the use of an extracted plant to control wound healing. *C* leaf juice *C. roseus* has been reported to be effective in lowering the levels of cholesterol, triglycerides, LDL-c, VLDL in serum levels and aortic history of liver and kidney aorta and showed significant atherosclerotic activity. Singh et al., [65] reported that methanol leaf extract of *C. rosea* has shown wound healing function in Streptozotocin-induced diabetic mice in concentrations of 200 and 400mg / kg.

II. CONCLUSION

Vinca is one of the most widely available and unique plants have life-saving properties. A lot of a cancerous disease, vinca has anti-cancer and anti-tumor properties. especially at only the latest stage was found. that it will be a failure in treatment due to sunset diagnosis. when a cell appears in the body then only cancer treatment is possible. Like vinca there are many more plants with anti-cancer properties. As synthetic drugs have many facets results but we also have similar traditional medicines vinca that has been used since ancient times. especially vinca rosea is used as Second-line treatment now -days. Cytotoxic US-authorized agents vinblastin, vincristine, vinorelbine. European have permitted alkaloid, vinflunine i.e. used for second-line treatment of change urothelium cell carcinoma. Soon advances in treatment and long-term research A complete cure for cancer is hopeful too days of cancer healing are not far off.

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We would like to express my special thanks of gratitude to our college Samarth Institute of Pharmacy for their able guidance and support for publication of this paper. we specially thank our honorable principal and all the teaching staff. There are many natural plants around us that can be used for medicinal purposes. Among those *Catharanthus roseus* is the date palm found throughout the tropics. *Catharanthus roseus* linn is a perennial herb found in southern Asia, tropics and native Madagascar, *catharanthus roseus* L. has many common names such as vinca rosea, madagascarperiwinkle, brig: Ayurveda is a common form of Indian medicine. focused on the power of herbal medicine. *Catharanthus roseus* is a well-known plant in Ayurveda. It is known for its antitumor, anti-diabetic, anti-microbial, anti-oxidant and antimutagenic effects. It is a evergreen plant native to the islands of Madagascar. The flowers can vary in color from pink to purple and the leaves are arranged in opposing pairs. It produces about 130 alkaloids mainly ajmalicine, vinceine, resperine, vincristine, vinblastine and raubasin. Vincristine and vinblastine are used to treat various types of cancer such as Hodgkin's disease, breast cancer, skin cancer and lymphoblastic leukemia. It is an endangered species and needs to be preserved using techniques such as micropropagation. It has a high therapeutic value that needs to be considered in detail. ht eyes, Cape periwinkle, graveyard plant, old maid, pink periwinkle, rose periwinkle myrtle. Kemunting Cina is a local name in Malaysia. The oldest group of alkaloid groups in the plant that treated cancer were vinca alkaloids [3]. The milk-producing vinca rosea stem contains a source of more than 70 indole alkaloids. Among them are two anti-neoplastic compounds found in the extracts of vinblastin and vincristine. For Hodgkin's lymphoma, vincristin is used as a chemotherapeutic regimen and in pediatric leukemia, vinblastin is used. Vinca alkaloid inhibits metaphase cellular mitosis and its most serious side effects are peripheral neuropathy, hair loss, hyponatremia and constipation. Mainly used for high

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