

REVIEW ARTICLE ON A BRIEF STUDY ON CATHARANTHUS ROSEUS

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ABSTRACT

The traditional Indian medical system known as Ayurveda places a strong emphasis on the body's ability to heal. Herbal remedies are a boon to humans since they are employed either directly or indirectly to treat both establishment and developing ailments. The plant *Catharanthus roseus* is widely known. It has anticancer, antidiabetic, antioxidant, antibacterial, and antimutagenic properties according to Ayurveda. Higher plants with the highest degree of success in chemotherapy for cancer use the alkaloid *Catharanthus roseus*, which is also referred to as Madagascar periwinkle. A species of blooming plant in the Apocynaceae family – which includes dogbanes – is the rosy periwinkle. The island of Madagascar is where this evergreen shrub originally evolved. The flower's colors can range from pink to purple, and its leaves are arranged in pairs on opposite sides. It produces about 130 alkaloids, mostly rubusidin, ajmalicine, vincenine, vinblastine, vincristine. Vinblastine and vincristine are used to treat a variety of cancers, including skin, breast, and Hodgkin's disease. It has significant therapeutic potential that requires further research.

Keywords: Alkaloid, *Catharanthus roseus*, Vincristine, Vinblastine, Anticancer, Periwinkle.

I. INTRODUCTION

Catharanthus roseus is a perennial flowering plant with an expanded lifespan. The Latin term *kanthos* (pure) and *anthos* (flower), which indicate the beauty of the blossom, are combined to make *Catharanthus* L.G. Don. *Roseus*, on the other hand, indicates red rose or pink. *Rhododendron roseus* L.(G) Don is a dicotyledonous angiosperm belonging to the family Euphorbiaceae. The Apocynaceae family. The dicotyledonous angiosperm plant produces the terpenoid alkaloids vinblastine and vincristine, which are employed in the treatment of cancer. Peckolt (1990) describes the use of an infusion of leaves to treat bleeding scurvy in Brazil. British related species have also been used to treat ulcers and diabetes, and an infusion of leaves has been used as a mouthwash for toothaches and to heal and clean chronic wounds in the West Indies. Although the plant's hypoglycemic and antibacterial properties have not been shown, ajmalicine, one of the alkaloids isolated from it, has been shown to temporarily lower arterial blood pressure. The plant has proliferated throughout India's tropical and subtropical regions, growing wild in the lower foothills of the country's hills in the north and south. Locally, it is referred to as kemunting Cina in Malaysia. Using the periwinkle logo, the National Cancer Council of Malaysia hopes to give cancer patients hope. The drug's primary negative effects include constipation, hair loss, peripheral neuropathy, and inhibition of the metaphase of cellular mitosis through binding to tubulin. Oncovin and Velban, the two most important anticancer drugs made from *Catharanthus roseus*, are marketed for a total of \$100 million in the United States.

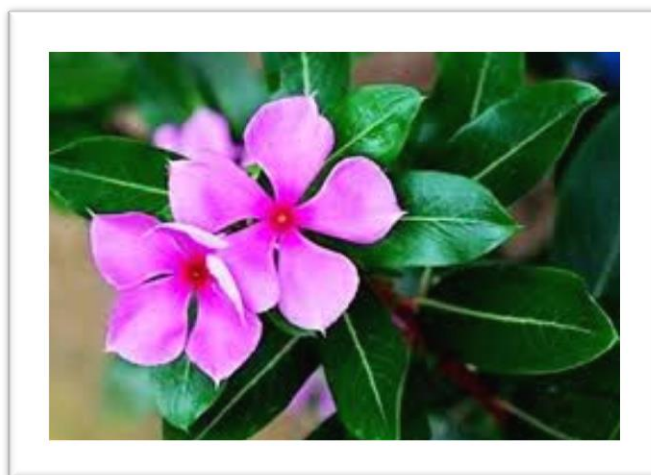


Fig 1. *Catharanthus roseus*.

SCIENTIFIC CLASSIFICATION :-

Botanical Name : Vinca Rosea (Catharanthus roseus)

Family Name : Apocynaceae

Subfamily : Rauvolfiadeae

Kingdom : Plante

Subkingdom : Tracheobinota: Vascular plant

Divison : Magnoliophyta (Flowering plant)

Subdivision : Spermatophyta

Class : Magnoliopsida (Dicotyledons)

Subclass : Asteridea

Order : Gentianales

Genus : Catharanthus

Species : C, roseus

VERNACULAR NAMES :-

English : periwinkle, old maid

Hindi : sada bahar,

Kannada : ganeshana hoo, betla hoo

Sanskrit : rasna, nityakalyani

Marathi : sadaphool, sadaphuli

Tamil : cutukattu mali,cutukattuppu

Gujrati : Barmasi

Bengali : noyontara

Malayalam : usmalari, savanari

Telgu : billaganneru

MORPHOLOGY:-

The herbaceous plant catharanthus roseus is an evergreen subherb that can reach a height of one meter . the stem has flexible , long, purple or green branches that are erect and laxly branching. The leaves are grouped in opposite pairs and are oval to ablong , 2.5-9.0 cm long and 1.35 cm broad they are glossy , green, and hairless, with a pale midrib and a short petiole that is around 1-18 cm long. The flower have five petals that are resemble lobes and is white dark pink with a dark red center . the basal tube is between 2.5 and 3 cm long , and the corolla is around 2.5 cm in diameter . the fruit is pair of follicles that are 3mm wide and 2-4 cm long.



Fig 2. Morphological features of Leaf, stem ,Flower, Fruit.



Fig 3. Morphology of catharanthus roseus.

GEOGRAPHICAL DISTRIBUTION:-

Native to Madagascar’s Indian ocean island of catharanthus roesus. In the wild It was thought to be an endangered plant. It is now common plant in many tropical and subtropical region in the world, including the southern united state.

POTENTIALLY ACTIVE CHEMICAL CONSTITUENTS :-

Researcher looking into its medicinal qualities found that it contains a class of alkaloids that, despite being incredibly toxic, may be useful in the treatment of cancer. From 0.74 to 0.82 percent , alkaloid is the main component vincristine, vinblastine , catharanthamine, and vincolline are important . other alkaloids , such as vincolline deoxyvinblastin, levosine,and other are isolated. Plant are capable of synthesizing a large number of different chemical substances . that are employed for vital biological task and defense against predators including fungi , insect, and herbivorous animals. Catharanthus roseus contain alkaloids, saponins, flavonoids, polysaccharide. the most potentially active ingredient in catharanthus roseus are alkaloids. The plant contain more than 400 alkaloids , which are utilized as pesticide , flavorings, fragrance, and therapeutic agrochemicals. Alkaloids such as vinblastine and vincristine are found in the aerial portion ,whereas ajmalicine ,rubasin is found in the basal stem and root . catharanthus roseus flower contain the anthocyanin pigment known as rosedin.

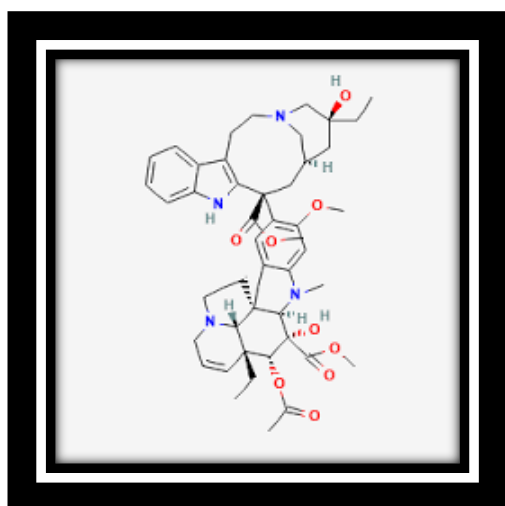


Fig 3. Vinblastine.

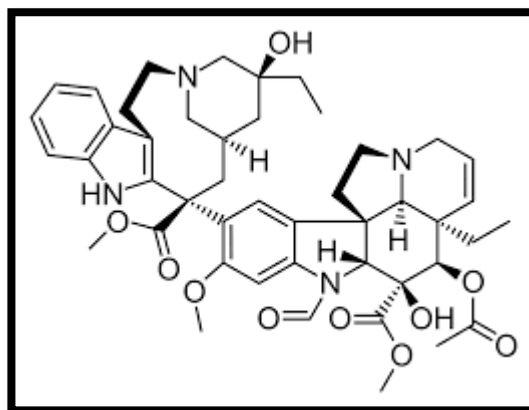


Fig 4. Vincristine.

II. PHARMACOLOGICAL ACTIVITIES

1) Anti-cancer activity :-

The anticancer properties of catharanthus roseus are attributed to the main indole alkaloid , vinblastine, which slow down the growth of the tumors, lymphomas , and leukemia . several in vivo and in vitro investigation have show that vinblastine and vincristine , as well as their derivatives, such as cathahunine , vinflunine , cathranthine and veneoreblin are also targetd against leukemia, carcinoma, breast cancer, lung cancer, and

solid tumor. It was discovered that varying percentage of catharanthus methanolic crude extract exhibited notable anticancer activity against many cell types. Vincristine is marketed as Oncovin and vinblastin as velban. Recent studies have show that catharanthus roseus root and stem extract has strong in vitro antitumor action against a range of cancer illness. Catharanthus methanolic crude extract demonstrated potent antitumor efficacy against the multidrug resistant tumor at different concentrations.

2) Anti-diabetic activity:-

The ethanolic extract of catharanthus roseus leaves exhibit a dose-dependent reduction in blood sugar that is similar to that of a prescription medication. Blood sugar reduction is similar to that of the common medication glibenclamide. The increased utilization of glucose in the liver has resulted in the hypoglycemic activity. The fact that control rats given the experimental leaves did not exhibit any hypoglycemia effect or noticeably alter their body weight suggests that catharanthus roseus does not have antidiabetic properties.

3) Anti-ulcer activity :-

The plant's alkaloids vincamine and vindoline demonstrated anti-ulcer properties. The plant's alkaloids vincamine exhibits neuroprotective and cerebrovasodilatory properties. The plant's leaves demonstrated anti-ulcer properties when they protected rats' stomachs from experimentally caused damage.

4) Wound healing property:-

Rat's ability to heal wounds was assessed using excision, incision, and dead space wound models following daily administration of ethanol extract of catharanthus roseus flowers at a dose of 100mg/kg. The animals were split into two groups of six in each of the models, and wound contraction, together with the enhanced tensile strength and hydroxyproline content, support the use of catharanthus roseus in the management of wound healing. Animals in group 2 were applied topically with an ethanol extract of catharanthus roseus at a dose of 100mg/kg, while animals in group 1 received topical treatment with carboxymethyl cellulose as a placebo control. Body weight was recorded each day.

5) Anti-helminthic activity :-

Historically, catharanthus roseus has been employed as an anthelmintic. Using *Pherithemaposthuma* as an experimental model, the antihelminthic property of catharanthus roseus was assessed in order to support the ethnomedical claims. The standard reference utilized was piperazine citrate.

III. CONCLUSION

Many innovative pharmaceutical medicines with strong pharmacological effects on the body have been derived from medicinal plants. People rather than employing chemical medications that have adverse effects, research into traditional medicine may reveal novel drug compositions that are less expensive, more effective, and have less negative effects. Even if many traditional medications were utilized without a fundamental understanding of their mechanisms, the effects of these drugs might be further demonstrated with the use of modern technology and equipment, with the appropriate approval from the relevant authorities, the active ingredients that cause the pharmacological effect may be located quite readily and also sold as a drug product itself. One of the 21,000 significant medicinal plants is catharanthus roseus. It is utilized to treat a variety of illnesses, including leukemia, oral ulcers, diabetes, and painful mouths. It yields over 130 alkaloids including ajmalicine, rubasin, vincine, and reserpine. Vitamin B and vitamin C exhibit anti-leukemic action. The plant contains varying levels of alkaloids in different places; the highest quality, or almost 1.79% is produced in the root bark. Numerous investigations back up its antimicrobial action against many microorganisms including *Shigella*, *Pseudomonas*, *Bacillus megaterium*, and *Staphylococcus albus*. There have also been reports of its antimutagenic and antioxidant properties. The further investigation of its antitumor properties, more research is required. Must be completed investigation. Among the catharanthus roseus significant medicinal plants with a wide range of biological characteristics, there is still much effort to be done to determine, new bioactive compounds, comprehending how bioactive compounds change from one form to another, developing novel extraction techniques like green extraction, and enhancing drying techniques like solar drying.

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