

***Catharanthus roseus* (An anti-cancerous drug yielding plant) - A Review of Potential Therapeutic Properties**

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ABSTRACT

Catharanthus roseus (L.) G. Don known as “The Madagascar periwinkle”. It is a popular ornamental plant found in gardens and homes across the warmer parts of the world. *Catharanthus roseus* (L.) G. Don, which also known as “an anticancerous drug yielding plant” is a tropical and subtropical plant belonging to the family Apocynaceae.

This review highlights the marvelous properties of this plant. The alkaloids like Vinblastine and vincristine are mainly present in aerial parts of *C. roseus*, which are used in treatment of various human cancers, so it is considered as mile stone in cancer chemotherapy. Apart from this it shows anti-diabetic, anti-bacterial, anti-oxidant, anti-ulcer and anti-diarrheal properties. Stems and leaves of *C.roseus* have enormous amount of phytochemical constituents. It is found to be endangered so, it is the topic of conservation also.

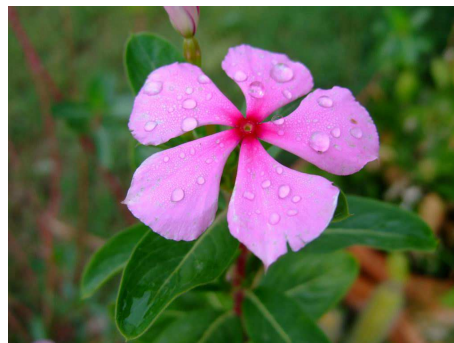
Keywords: - *Catharanthus roseus*, therapeutic, anti-cancer, vinblastine and vincristine.

INTRODUCTION

Catharanthus roseus (L.) is an important medicinal plant of the family Apocynaceae which contains a virtual cornucopia of useful alkaloids, used in diabetes, blood pressure, asthma, constipation, and cancer and menstrual problem. There are about two common cultivars of *C. roseus* which is named on the basis of their flower colour that is the pink flowered “Rosea” and the white flowers “Alba”. *Catharanthus roseus* which is proudly known as the Madagascar periwinkle is found to be a species of *Catharanthus* native and also endemic to Madagascar. The synonyms of the plant name include *Vinca rosea*, *Ammocallis rosea* and *Lochnera rosea*, other English names occasionally used for the plant include Cape Periwinkle, Rose Periwinkle, Rosy Periwinkle and “Old Maid”.

Classification:

Plantae
Angiosperms
Eudicots
Asterids
Gentianales
Apocynaceae
Catharanthus
C. roseus



Bi nomial Name- *Catharanthus roseus* (L.) G. Don

Morphology:

Catharanthus roseus is an evergreen subherb or herbaceous plant growing to 1 m. tall. The leaves are oval to oblong, 2.5- 9.0 cm. long and 1- 3.5 cm. broad glossy green hairless with a pale midrib and a short petiole about 1- 1.8 cm. long and they are arranged in the opposite pairs. The flowers are white to dark

pink with a dark red centre, with a basal tube about 2.5- 3 cm. long and a corolla about 2-5 cm. diameter with five petal like lobes. The fruit is a pair of follicles about 2-4 cm. long and 3 mm broad.

Geographical Distribution:

Catharanthus roseus is native to the Indian Ocean Island of Madagascar. In the wild, it is found to be an endangered plant and the main cause of their decline is the habitat destruction by the slash and burn agriculture however, it is now common in many tropical and subtropical regions worldwide, including the Southern United states.

Cultivation:

C. roseus is best grown as an annual bedding plant in well drained sandy loams in full sun to part shade. Needs regular moisture, but avoid overhead watering. Superior soil drainage is the key to growing this annual well. Starts seeds indoors 12-16 weeks before last frost date. Thrives in hot and humid summer weather. Cutting may be taken from plants in late summer for overwintering so as to provide a stock the following spring. Container plants may be overwintered indoors. May self seed in optimum growing conditions.

Numerous cultivators have been selected for variation in flower colour (white, mauve, peach, scarlet and reddish orange) and also for tolerance of cooler growing condition in temperate regions.

Potentially Active Chemical Constituents:

C. roseus posses carbohydrate, flavinoid, saponin and alkaloids. Alkaloids are the most potentially active chemical constituents of *Catharanthus roseus*. More than 400 alkaloids are present in the plant, which are used as pharmaceuticals, agrochemicals, flavor and fragrance, ingredients, food additives and pesticides. The alkaloids like actineo plastidemic, Vinblastin, Vincristine, Vindesine, Vindeline Tabersonine etc. are mainly present in aerial parts whereas ajmalicine, vinceine, vineamine, raubasin, reserpine, catharanthine etc are present in roots and basal stem. Rosindin is an anthocyanin pigment found in the flower of *C. roseus*.

Therapeutic Properties/ Uses:

1. **Anti cancer property-** The anticancer alkaloids Vinblastine and Vincristine are derived from stem and leaf of *Catharanthus roseus*. These alkaloids have growth inhibition effect to some human tumors. Vinblastine is used experimentally for treatment of neoplasmas and is recommended for Hodgkins disease, chorio carcinoma. Vincristine another alkaloids is used for leukemia in children. Vinblastine is sold as Velban or Vincristine as oncovin.
2. **Anti diabetic property-** The ethanolic extracts of the leaves and flower of *C. roseus* showed a dose dependent lowering of blood sugar in comparable to the standard drug. Lowering of blood sugar in comparable to the standard drug gliben clamide. The Hypo glycemc effect has appeared due to the result of the increase glucose utilization in the liver.
3. **Anti bacterial property-** Crude extracts from different parts of the plant was tested for anti bacterial activity. Extract from leaves showed significantly higher efficacy. The anti bacterial activity of the leaf extract of the plant was checked against micro organism like *Pseudomonas aeruginosa* NCIM2036, *Salmonella typhimuruim* NCIM2501, *Staphylococcus aureus* NCIM5021 and was found that the extracts could be used as the prophylactic agent in the treatment of many of the disease.
4. **Anti oxidant property-** The anti oxidant potential of the ethanolic extract of the roots of the two varieties of *C. roseus* namely rosea (pink flower) and alba (white flower) was obtained by using different system of assay. The result obtained proved that the ethanolic extract of the roots of Periwinkle varieties has exhibited the satisfactory scavenging effect in the entire assay in a concentration dependent manner but *C. roseus* was found to possess more antioxidant activity than that of *C. alba*.
5. **Anti helminthic property-** Helminthes infections are the chronic illness, affecting human beings and cattle. *Catharanthus roseus* was found to be used from the traditional period as an anti helminthic agent. The anti helminthic property of *C. roseus* has been evaluated by using

Pherithema postuma as an experimental model and with Piperazine citrate as the standard reference. The ethanolic extract of the concentration of 250 mg/ml was found to show the significant anti helminthic activity.

6. **Anti ulcer property-** Vincamine and Vindoline alkaloids of the plant showed anti ulcer property.
7. **Hypertensive property-** Extract of leaves of the plant made significant change in hypotensive.
8. **Anti diarrheal property-** The anti diarrheal activity of the plant ethanolic leaf extracts was tested in the wistar rats with castor oil as a experimental diarrhea inducing agent in addition to the pretreatment of the extract. The anti diarrheal effect of ethanolic extracts *C. roseus* showed the dose dependant inhibition of the castor oil induced diarrhea.
9. **Phyto remediation-** Exposed *C. roseus* bioaccumulates heavy metal like cd etc., so it is used in phyto remediation.
10. **Folkloric uses-**
 - In India- The juice of leaves is used as application to bee sting/ wasp sting.
 - In Philippines- Decoction of leaves is used in diabetes and decoction of young leaves is used in stomach cramps, root decoction is used for intestinal parasitism. Infusion of leaves is used for treating menorrhagia. Crude leaf extracts and root has anti cancer activity. Roots used for dysentery.
 - In Madagascar- The bitter and astringent leaves are used as vomitive, roots used as purgative, vermifugl, depurative, hemostatic and toothache remedies.
 - In Mauritius- The juice of leaves is used for indigestion and dyspepsia.
 - In West Indies and Nigeria- The plant is used in diabetes.
 - In Cuba and Jamaica- Flower extract is used for eye wash in infants.
 - In Bahamas- Decoction of flower is used in asthma, tuberculosis and flautlence.
 - In Malaysia- The plant is used in diabetes, hypertension, insomnia and cancer.
 - In Hawaii- Extract of boiled plant is used to arrest bleeding.
 - In America- Gargle of plant is used to ease soarthroats, chest ailments and laryngitis.
 - In Africa- Leaves are used for menorrhagia and rheumatism.

Catharanthus roseus is used in plant pathology as experiment host for phytoplasmas. This is because it is easy to infect with a large majority of phytoplasmas and also often has very distinctive symptoms such as phyllody and significantly reduced leaf size.

CONCLUSION

Medicinal plant is the most exclusive source of life saving drugs for majority of the world's population. They continue to be an important therapeutic aid for alleviating the ailments of human kinds. The search for defence mechanism, longevity and remedies to relieve pain and discomfort drove early man to explore these immediate natural surroundings. It led to the use of plants, animal products and minerals etc., and the development of a variety of therapeutic agents. Today, there is a renewal interest in traditional medicine and an increasing demand for more drugs from plant sources because green medicine is safe and more dependable then costly synthetic drug, many of which have adverse side effects.

Catharanthus roseus was investigated from the ancient time for their phytochemical components and their therapeutic effect. The plant contains enormous phytochemical constituents of various medicinal applications. The plant also possess various property such as anti cancerous, anti diabetic, anti helminthic, anti diarrheal, anti microbial etc. Hence most work could be done on the above plant to reveal the unknown mysteries which would help the need of the present pharmaceutical world.

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