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Review Article

A BASIC REVIEW ON VINCA ROSEA

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Abstract

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 cell 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, Anti-Tumor Properties.



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Introduction

There are many naturally grown plants around us which may be used for medicinal purpose. Among those *Catharanthus roseus* is the plant which is globally found in tropical areas. *Catharanthus roseus* Linn is a perennial plant which are mostly found in southern Asia, tropical countries and are native to Madagascar [1,2]. *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*. It is used for ornamental purpose which has different colors of pink, purple and white and it is also used as a medical plant. *Kemunting Cina* is the name which is locally called in Malaysia. The oldest group of the plant alkaloids groups that used to treat cancer are the *vinca alkaloids* [3]. The stem of *vinca rosea* which produces a milky sap has a source of over 70 different indole alkaloids. Among them there are two anti-neoplastic compounds derived from plants of *vinblastin* and *vincristine* [4]. For Hodgkin's lymphoma, *vincristine* is used as a chemotherapeutic regime and for childhood leukemia, *vinblastin* is used. The *vinca alkaloid* inhibits the metaphase of the cellular mitosis and their main side effects are peripheral neuropathy, hair loss, hyponatremia and constipation [5]. They are mainly used for hypertension, diabetes, blood cancer, malaria, non-small-lung cancer, Hodgkin's lymphoma, improve memory. It also has antimicrobial activity, antioxidant activity, anti-diarrheal activity, hypolipidemic activity and also wound healing activity.

HISTORY

Linnaeus created the genus *Catharanthus* (from the Greek *katharos* (pure) and *anthos* (flower)). The Scottish botanist George Don determined the botanical name of *vinca* was *Catharanthus roseus* which has been the subject of numerous questions and polemic debates about its denomination. Carl von Linné, a Swedish naturalist in 1759 was named under *Vinca rosea*, which was the first of his genus. In 1828, the German botanist Heinrich Gottlieb Ludwig Reichenbach proposed the genus name *Lochnera*. The species was renamed *Lochnera rosea* by an Austrian botanist, Stephan Ladislaus Endlicher in 1838. William Stearn confirmed the botanical name *Catharanthus roseus* as the correct appellation of the Madagascan periwinkle. In addition, Stearn points out in his chapter "Synopsis

of the Genus *Catharanthus*" that the genus name *Lochnera* is not valid because it is too close to the name of another genus, *Lochneria*, published in 1777 by the naturalist Giovanni Antonio Scopoli.

CLASSIFICATION

Table 01: Scientific Classification of Vinca Rosea

KINGDOM	PLANTAE
DIVISION	Magnoliophyta
CLASS	Magnoliopsida
ORDER	Gentianales
FAMILY	Apocynaceae
GENUS	Catharanthus
SPECIES	Roseus

VERNACULAR NAMES

Table 02: Vernacular Names of Vinca Rosea

ASSAMESE	NAYANTARA, PIRALI KUNWORI
BENGALI	Nayantara
ENGLISH	Madagascar Periwinkle
HINDI	Sadabahr, sadaphuli, sadahagi
MALAYALAM	Shayam naari
MARATHI	Sadaphuli
TELUGU	Billaganneru
TAMIL	Nithyakalyani
OTHERS	Savanari, Periwinkle, Nithyakalyani, Cape periwinkle.

SYNONYMS

Table 03: Synonyms of Vinca Rosea

<i>Ammocallis rosea</i> (L.) Small
<i>Lochnera rosea</i> (L.) Rchb.
<i>Lochnera rosea</i> var. <i>flava</i> Tsiang
<i>Pervinca rosea</i> (L.) Gaterau
<i>Vinca gulielmi-waldemarii</i> Klotzsch
<i>Vinca rosea</i> L.
<i>Vinca rosea</i> var. <i>albiflora</i> Bertol.
<i>Vinca speciosa</i> Salisb.

DESCRIPTION

A Periwinkle is very common plant that is found in India. It is botanically named as *Catharanthus roseus* and belongs to Apocynaceae family. It is a shrub that grows to a height of 1-3 feet having smooth, glossy, dark green leaves and flowers throughout the year. The periwinkle flowers are found in different colours blue, purple, violet, pink and white. These plants are native to North America, Europe, India, China. Almost all parts of periwinkle plant have medicinal properties. Periwinkle is a plant of immense medicinal value. All part of the plant is medicinally important however alkaloids are mostly concentrated in roots bark. These include three important alkaloids of Rauwolfia group which are ajmalicine, reserpine and serpentine. In addition to these the other important alkaloids found are vindoline, vincristine, vinblastin. The *vinca rosea* used both in Ayurvedic medicine and Chinese medicine.

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, uncostate reticulate venation.

INFLORESCENCE

cymose, flower arranged in axillary pairs.

FLOWER

pedicellate, bractate, hermaphrodite, actinomorphic, complete, pink, hypogynous

CALYX [K]

5, polysepalous, glandular, green, inferior, quinquecostate

COROLLA [C]

5, gamopetalous, corolla tube, throat of corolla tube hairy forming a corona, contorted aestivate

ANDROECIUM [A]

5, free, epipetalous, alternate to petals, almost sessile, anthers dorsifixed, yellowish.

GYNOECIUM [G]

2 carpels, bicarpellary, syncarpous, carpel united above in the region of the style and stigma, ovaries free, nectar glands present, unilocular, marginal placentation.

FRUIT

A pair of elongated follicles.

USES

The leaves, flowers and roots are used in Ayurvedic medicine. Chinese medicine uses the extract of the plant for diseases such as diabetes, malaria, leukemia and Hodgkin's disease. In traditional medicine, the leaf juice has been used to treat wasp stings, a gargle is used for sore throats, flower extracts are used for infants eye wash. Periwinkle tea is used to treat diabetes and cough. The leaves and stems are the source of alkaloids that have anti-tumor and anti-cancer properties. The leaves are used to control diabetes and high blood pressure. The alkaloids also offer sedative and tranquilizing properties. It relieves muscle pain and depression because of its property of detoxification and counteracting poison, it is used to relieve wasp stings. This plant controls nose bleed, bleeding gums, mouth ulcers and sore throats. It is useful in treating gastritis, cystitis, enteritis, diarrhea, diabetes etc when taken internally. The *vinca rosea* plant ensures brain health. Its active ingredients improve blood supply to the brain, increase the level of oxygen that the brain can utilize. It also raises serotonin levels and prevents abnormal coagulation of blood. The alkaloid vincamine keeps the blood thin and has memory enhancing properties. It is therefore useful in preventing dementia especially vascular dementia. Periwinkle can be dangerous if consumed orally. The plant should be avoided by pregnant women.

PHARMACOLOGICAL ACTIVITIES**1. ANTI-NEOPLASTIC ACTIVITY**

The leaves and stems are the source of alkaloids that have anti-tumor and anti-cancer properties. Alkaloids inhibit the tumors. Vinblastin is used for the treatment of neoplasm of Hodgkin's

disease,chorio carcinoma.Vincristine is used for the leukemia in children.Vinblastinis sold as Velban or Vincristin as oncovin. drugs. To improve the therapeutic index, Semi-synthetic Catharanthus alkaloids such as vinorelbine and vinflunine were developed. Vinorelbine and vinflunine exert their antitumor effect by binding to tubulin.The alkaloids are also called mitotic spindle poisons they inhibit the metaphase of microtubules which inhibit the mitosis in cell cycle .Hence vinca alkaloida helps in preventing the cancer from further division [6].

2.ANTI-DIABETIC ACTIVITY

Vinca rosea of flowers and leaves have ethanolic extracts which is similar to the standard drug glibenclamide which is a hypoglycemic agent.The Hypo glyceemic action has been arosed due to the result of the increase glucose utilization in the liver [7,8,9].Due to utilization of glucose in liver ,hypoglycemic activity is been observed.Dichloromethane: methanol extract [1:1] has hypoglycemic activity on leaves and twigs of vinca in streptozotocin which induce diabetic rat model at the dose of 500mg/kg which is been admistered orally for 7-15days. . 48.6 and 57.6% hypoglycemic activity was observed and further treatment for a period of 30 days has provided complete protection against STZ challenge (75 mg/kg/i.p.).Glycogen synthase, glucose 6-phosphatedehydrogenase, succinate dehydrogenase and malate dehydrogenase are the enzyme activities which decrease the liver of diabetic animals and it is been improved after the treatment with extract at a dose of 500mg/kg oral for 7 days.it indicates the increase in the metabolized glucose in the rats which are been treated with increased lipid per oxidation levels.

3.ANTI-MICROBIAL ACTIVITY

Vinca has immense medicinal values which also helps for the creation of novel pharmaceuticals as most of the bacterial pathogenswhich improve the resistance against many of the available anti-microbial drugs. The plants also have the natural chemotherapeutic agents which suggest a broad spectrum of action with the greater emphasis on the preventive action [10].

4.ANTI-OXIDANT PROPERTY

Anti -oxidant property is mainly found in the roots of pink and white flowers which have ethaonlic extracts which is obtained from different assays such

as hydroxyl radical-scavenging activity,uperoxide radical-scavenging activity,DPPH radical-scavenging and nitric oxide radical inhibition method [11].

5.ANTI-HELMINTHIC ACTIVITY

Human beings and cattle are more prone for this chronic illness of helmenthic infections.Vinca has anti -helmenthic property which is been evaluated by experipement model of pherithema postuma and piperazine citrate as standard reference.250mg/ml is the ethanolic extract for anti-helimenthic activity [12].

6.WOUND HEALING PROPERTY

Ethanolic extracts of 100mg/kg/day is given for rats which have wound gealing property.There is a decrease in epithelization period which has high rate of wound contraction,which is marked as an increase in dry weight and hydroxyproline .There is an increase in the tensile strength along with hydroxyproline which helps in management of wound healing together[13].

7.HYPOLIPIDIMIC ACTIVITY

There is a reduction of serum levels liketotal cholesterol,triglycerides,LDL-c,VLDLc, which is a anti-atherosclerotic activity which is by the leaf juice of vinca .Thus resulted as anti-oxidant effect of flavonoid,vinpocetinlike compound present in the leaf juice of vinca. [14].

8.ANTI-DIARRHEAL PROPERTY

Anti-diarrheal property is tested in wistar rats by the ethanolic leaf extracts and castor oil as an experiment of diarrroha has pretreatment extract. The effect of anti-diarrheal was shown by the dose dependent inhibition of the castor oil induced diarrhea[15]. The dose dependent inhibition of the castor oil induced diarrhea is at the doses of 200 and 500 mg/kg as well as inhibition of the gastrointestinal propulsion of charcoal meal. This data corroborates the traditional usage of vinca in the treatment and management of diarrhea [16].

9.ANTI-ULCER PROPERTY

There are two alkaloids which have anti-ulcer property such as Vincamine and Vindoline . Vincamine has activity of cerebrovasodilatory and neuroprotective by the plant leaves but they induced gastric damage in rats [17].

10.HYPOTENSIVE PROPERTY

The hypotensive property is found in the leaf extract which contain 150 useful alkaloids and other which have pharmacologically active compounds. Hypoglycemic and hypotensive activity of the leaf extracts (hydroalcoholic or dichloromethane-methanol) have been reported in laboratory animals [18].

11.ENHANCEMENT OF MEMORY

There is one alkaloid named Vinocetine which has property to improve brain function and memory which is beneficial to Alzheimer's disease. Vinocetine when subjected to a well-tolerated dose up to 60 mg/d in clinical trials of dementia and stroke proved no significant adverse events [19].

12.OTHER ACTIVITES

There is a contraindication with Vinocetine and other blood thinning agents such as warfarin, aspirin along with other dietary supplements such as ginkgo, vitamin E and garlic.

CONCLUSION

Vinca is one of the mostly available plant and its have the life saving property. The most of the trending disease is the cancer , vinca have the anti-cancer and the anti-tumor properties. mostly the at the later satge only cancer is been detected. there will be a failure in the treatment due to the late diagnosis. if the cell are been identified in the body then only the cancer cure is possible. Like vinca there are many plant which many have anit-cancer properties. As the synthetic drug have many side effects but we also have the traditional medicine like vinca which is been used from the ancient times. mostly the vinca rosea is been used as the second line therapy now -a-days. The cytotoxic agents which were been approved by the US are vinblastin , vincristine, vinorelbine. European have been approved the alkaloid , vinflunine which is used for the treatment of second-line transitional cell carcinoma of the urothelium . With rapid advancement in treatment and prolonged research the complete cure for cancer has hope after all and the days of curing cancer are not very far.

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