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"A Brief Review: on catharanthus Roseus"

Miss.Niharika Sudhir Patil, Prof.Prachi k. Dusane
(Final Year B-Pharmacy / viith Semester)
Assistant professor
(Dept. Quality Assurance) Submitted To
P.S.G.V.P. Mandal's College of Pharmacy, Shahada,
Dist.: Nandurbar,
KAVAYITRI BAHINABAI CHAUDHARYNORTH MAHARASHTRA UNIVERSITY, JALGAON
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ABRIEFREVIEW ON CATHRANTHUS ROSEUS

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History :
Peckolt, in 1910, described the use in Brazil of an infusion of the leaves to control hemorrhage and scurvy, as a mouthwash for toothache, and for the healing and cleaning of chronic wounds. In Europe related species have been used for the proprietary suppression of the flow of milk . In the British West Indies it has been used to treat diabetic ulcer and in has been reported as being an effective oral hypoglycemic a agent. More recently,Chopra et all.have reported that the total alkaloids possess a limited antibacterial activity as well as a significant and sustained hypotensive action. The hypoglycemic and antibacterial activities have not been confirmed, although one of the alkaloids isolated from this plant, ajmalicine, has been reported to possess transient depressor action on arterial blood pressure,[1]

I. INTRODUCTION:

Catharanthus roseus, commonly known commonly known as bright eyes, Cape periwinkle, graveyard, Madagascar periwinkle, old maid, pink periwinkle rose prewinkle,is a species of flowering plant in the family Apocynaceae. It is native and endemic to Madagascar, but grown elsewhere as an ornamental and medicinal plant. It is aSource of drugs vincristine and vinblastine, used to treat cancer,[2]It was formerly included in formerly, Vinca as Vinca rosea Medicinal plants have a long history of usage in traditional Medicine. Ethno-botanical information on medicinal plant and their usage by indigenous cultures is useful in the conservation of traditional cultures,health care and drug development. Catharanthus roseus L.(G) Don is an important medicinal plant belonging to the Apocynaceas family; this plant is a dicotyledonous angiosperm and synthesis two terpene indole alkaloids:vinblastin and vincristine that are used to fight cancer,[3]

Fig No.1:Catharanthus Roseus.

Scientific Name :
Botanical name :-catharanthus disease (Linnaeus) G.Don. **Domain:-**Eukarya : eukaryotes.
Kingdom:-plantas: plants.
Subkingdom:-Tracheobionta: vascular plants.
Subdivision:-Spermatophyte: seed plants.
Division:-Magnoliophyta: flowering plants.
Class:-Magnoliopsida: dicotyledon.
Subclass :- Asteridea.
Suborder :-Gentiananae.
Order :-Gentianales.
Family :-Apocynaceae.
Subfamily:-Rauvolfiodeae.
Tribe :-Vinceae.
Genus :-Catharanthus G. Don.
Species :-Roseus, [7]
❖**Vernacular names :**

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English : cayenne jasmine, old maid, periwinkle.
Hindi : sada bahar, sadabahar.
Kannada : batla hoo, bili kaasi kanigalu, ganeshana hoo**,** kempu kaasi kanigalu.
Malayalam: banappuvu, nityakalya,savanari.
Marathi : sadaphool, sadaphul, sadaphuli.
Sanskrit : nityakalyani, rasna, sadampuspa, sadapushpi.
Tamil : cutkattu malli, cutukattu malli, cutukattuppu.
Telugu : billaganneru. **Gujarati :** Barmasi.
Bengali : noyontara,[8]

Morphology:

- Catharanthusroseus is a perennial small herb or sub-shrub, up to 90 cm in height.
- Stem is erect, lax branching with flexible long branches, purple or light green.
- Leaves are simple, cauline, opposite, ex-stipulate, petiolate, elliptic ovate to oblong, 4-10 by 2-4 cm glabrous to pubescent, base acute or cuneate, apex obtusely apicula te and lateral nerves 10- 12 pairs.
- Petiole in 1.0 cm. Catharanthus Roseus in a evergreen subherb or herbaceous plant growing to 1mm tall.

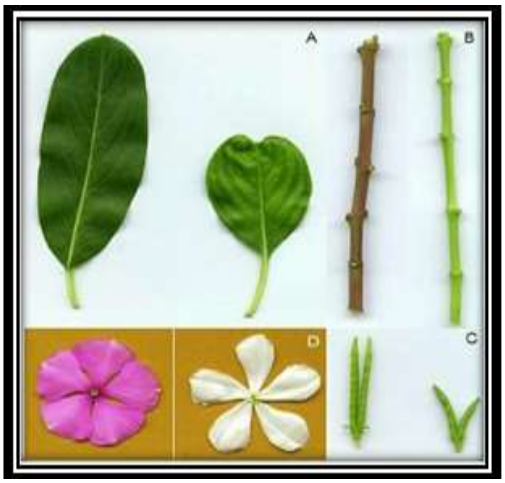

Fig No.2 :Morphological features of Leaf, Stem, Flower, Fruit.

Fig No. 3 : Morphology of catharanthus roseas

A Reviewon
(Flowers, leaves, stem, follicle with seeds, seed
PlantHabits :
Vinca is an erect, ever blooming hue or under shrub which is woody at the base. It is 4080 cm height. The flower are violet, pink or White in colour. The leaves are opposite, oblong and petiolate with entire margins and fruits are divergents follicles,[13].

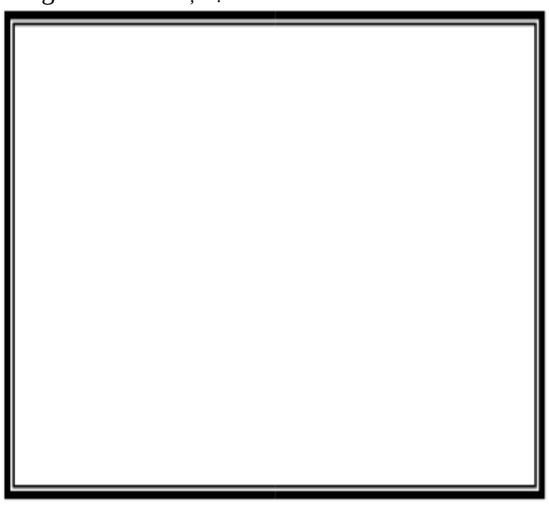

Fig No. 5: Herbs and shrubs of catharathus roseus.

Potentially Active chemicals Consistuents :

Researchers investigating its medicinal properties discovered that it contained a group of alkaloids that, though extremely toxic, had potential uses in cancer treatment. Plants have the ability to synthesize a wide variety of chemical compounds that are used to perform important

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biological functions, and to defend against attack from predators such as insects, fungi and herbivorous mammals. C. roseus posse's 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 plastidemeric, Vinblastine, Vincristine, Vindesine, Vindeline Tabersonine etc. are mainly present in aerial parts whereas ajmalicine, vinceine, vineamine, raubasin, reserpine, catharanthine etc are presentRoseus in$_{14}$ roots and basal stem. Rosindin is an anthocyanin pigment found in the flower of C.

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A Review onVinblastine,Vincristine, and Vindesine :

Vinblastine and vincristineare alkaloidsderived from the periwinkle plant Catharanthus roseus. These compounds have cell cycle-specific activity in the Mphase,which is consistent with their ability to inhibit tubulinpolymerizationand prevent formation of the mitoticspindle.In this manner, they induce a terminal mitoticarrestthat ultimately leads to cell death, [15.]

Vinblastine :

Vinblastine is indicated in the treatment of patients with Hodgkins and non-Hodgkin's lymphomas, breast cancer Kaposi's sarcoma, renal cell cancer,cancer,and testicular cancer.

Fig No.: 6 Vinblastine

Vincristine :

Vincristine (vincristine sulfate, info in solution, vincasar; Eli Lilly, Adria ; 1, 2 , and 5 mg vialsfor injection); compared to other drugs, vincristine is inexpensive and well tolerated.

Fig No.7 : Vincristine.

Vindesine :

Vindesine, also termed Eldisine, is a semisynthetic vinca alkaloid derived from the flowering plant Catharanthus roseus.Like the natural (e.g. vinblastine and vincristine) and semisynthetic vinca alkaloids (e.g. vinorelbine and vinflunine) derived from this plant.

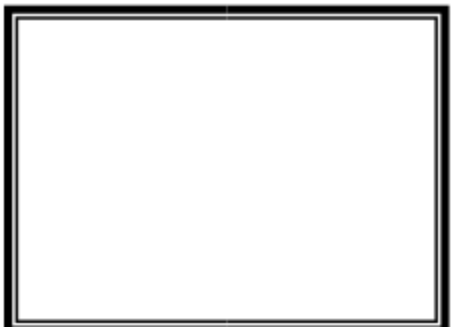

Fig No. 8: Vindesine.

Tabrosonine :

Tabersonine is a terpene indole alkaloid found in roseus and also in the genus Voacanga(both taxa family Apocynaceae the medicinal plant Catharanthus belonging to the alkaloid-rich

Fig No. 9 : Tabersonine

Biosynthesis ofVinblastine, vincristine,Vindesine and Tabersonine :

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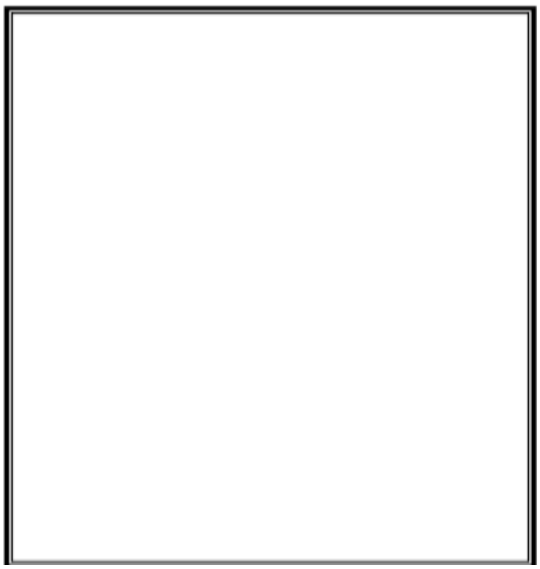

Fig No. 10 : Biosynthesis of Vinblastine, Vincristine, Vindesine, Tabersoline.

PharmacologicalActivities :

Catharanthus roseus,which is a potent medicinal plant many of the pharmacological actions such as antimicrobial, antioxidant, anthelmintic, antifeedant, antisterility, antidiarrheal, antidiabetic effect etc. That is used to treat many of the fatal diseases. Alkaloids were the major phytochemical constituent of the above medicinal plant and have different types possessing various medicinal uses.

Anti-canceractivity :

The plant has been called a miracle in the prevention of childhood leukemia and cancer treatment. To protect Madagascar periwinkle is to protect the future of your children in the opinion of many. It has been suggested that, instead of using the site effects causing chemical drugs, people should use use Catharanthus roseus extraction, [21].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.

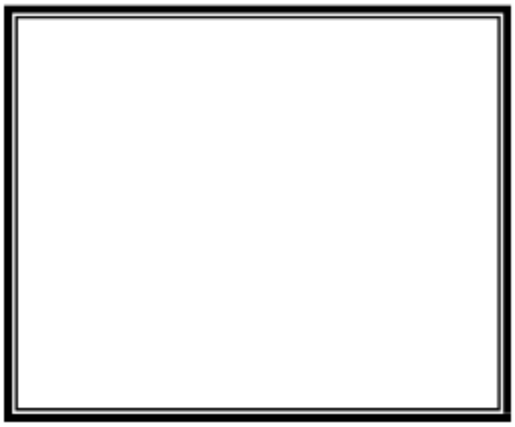

Fig No.11 : The Madagascar periwinkle (Catharanthus roseus) makes anti-cancer compound vinblastine.

1.Anti-oxidant properties :

Changes in antioxidant potentials and indole alkaloid, ajmalicine, production were studied in Catharanthus roseus (L.) G. Don. plants under treatment with gibberellic acid (GA(3)). The GA(3) treatments were given in two ways, foliar spray and soil drenching methods on 30, 45, 60 and 75 days after planting (DAP). The plants were uprooted randomly on 90 DAP and separated into root, stem and leaves and used for analyses.

3. Anti-Diabetic Activity:

In control rats, fed with the experimental leaves did not show any hypoglycaemia effect and no significant body weight changes were found indicating that Catharanthus roseus has anti-diabetic activity. found indicating that Catharanthus roseus has anti- diabetic activity. glucose level, Plasma lipid, [25] .Diabetes was induced by intraperitoneal injection of streptozotocin (STZ, 55 mg/kg body wt) to male Wistar rats.

4.Anti-MicrobialActivity :

The antimicrobial activity of Vinca rosea was evaluated against pathogenic bacterial strains (Bacillus subtilis, B. licheniformis and Azotobacter sp.) and fungal strains (Asprgillus niger, Alternaria solani and Rhizopus oryzae) using agar well diffusion method. Methanolic extracts of in vivo leaf, in vitro leaf, in vitro calluses of leaf, nodal and fruit explants were used and exhibited antimicrobial activity as indicated by minimum inhibitory concentration (MIC), [27].

5.Anti-Diarrheal Activity :

The in vivo antidiarrheal activity of C. roseus ethanolic leafextract in Wistar rats. Castoroil was used to induce experimental diarrhea in rats

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pretreated with extracts administered at 200 and 500 mg/kg to determine antidiarrhealeffect. Loperamide and atropine sulphate were used as standard drugs in the two experiments.

6. Anti-UlcerActivity :

Vincamine and Vindoline alkaloids of the plant showed antiulcer property. The alkaloid vincamine, present in the plant leaves shows cerebrovasodilatory and neuroprotective activity. The plant leaves proved for anti-ulcer activity against experimentally induced gastric damage in rats, 30.

7.Anti-Helminthic Activity :

Catharanthus roseus has been traditionally used as an anthelminthic agent. To justify the ethnomedical claims, the anthelminthic property of Catharanthus roseus was evaluated using Pherithema posthuma as an experimental model. Piperazine citrate was used as the standard reference

8. Hypotensive property :

Catharanthus roseus leaves extract and commercial drug Atenolol were administered through intraperitoneal (i.p) route for one week. Different biochemical parameters such as heart weight, blood glucose level, serum cholesterol level, serum triglyceride level, body weight and the relationships between them were measured. Catharanthus roseus leaves extract at a dose of 30 mg/155+/-15 gm of body weight was injected in rat at every morning during the treatment period. The dose of Atenolol was determined according to its pharmacokinetic parameters.

9.Hypolipedimic property :

The significant enhancement in plasma total cholesterol, triglycerides, LDL and VLDLcholesterol, and the atherogenic index of diabetic rats were normalized in diabetic-treated rats. Decreased hepatic and muscle glycogen content and alterations in the activities of enzymes of glucose metabolism (glycogen phosphorylase, hexokinase, phosphofructokinase, pyruvate kinase, and glucose-6-phosphate dehydrogenase), as observed in the diabetic control rats, were prevented with C. roseus administration. Our results demonstrated that C. roseus with its antidiabetic and hypolipidemic properties.

10. Wound Healing property :

Wound healing activity was determined in rats, after administration (100 mg kg^{-1} day^{-1}) of the ethanol extract of C. roseus flower, using excision, incision and dead space wounds models. The animals were divided into two groups of 6 each in all the models. In the excision model, group 1 animals were topically treated with carboxymethyl cellulose as placebo control and group 2 received topical application of the ethanol extract of C. roseus at a dose of 100 mg/kg body weight/day.

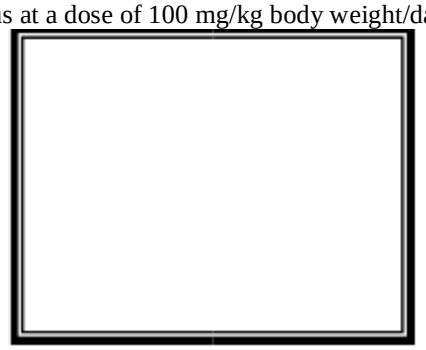

Fig No.13 : Use and preparation of catharanthus Roseus.

MedicalProperties OfCatharanthus Roseus:

- **Leaves :**

1. Used in diabetic. (enhanced secreted of insulin).
2. Vomitive.
3. Young leaves for stomach cramps.
4. Alkaloid anti-cancers (cytochrome P450 oxidation enzyme inhibition).
5. Application to wasp, been stings.

- **Roots :**

1. Purgative, Vermifuge, hemostatic, depurative.
2. Dysentry.
3. Antibacterial, Antifungal, Antiviral.

• **Flowers :**

1. Extract use for eye wash in infants.
2. Asthma, [36] .

Varities of Catharanthus Roseus:

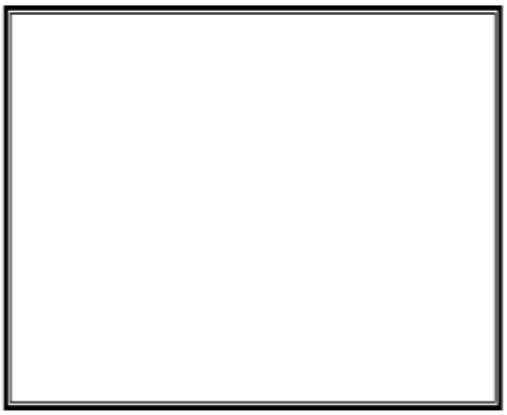

Fig No. 14 : Photographs of eight varieties of catharanthus roseus. (a) Patricia White (PW); (b) First Kiss Polka Dot (FKD); (c) First Kiss Peach (FKW); (d) Experimental Rose Pink (ER); (e)

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Experimental Deep Pink (ED); (f) Cooler Orchid (CO); (g) Victory Red (VR); (h) Blue (BP), [37].

II. CONCLUSION:

Medicinal plants were the potent source of various novel pharmaceutical products that shows ect causing potent pharmacological effect on the human beings. Instead of using the side effects causing chemical drugs, the ancient medicine could be explored to identify the novel drug formulations that are more effective with lesser side effects and also cheaper cost. Though, many of the traditional drugs were used without understanding the basic mechanism, their effect could be proved further with the help of the present technology and tools. The active compound that is responsible for the pharmacological effect could be found very easily and also commercialized as a drug product itself with proper approval from the respective organizations. Catharanthus roseus is one of the 21000 important medicinal plants found. It is used for the cure of a number of diseases such as diabetes, sore mouth, mouth ulcers, and leukemia. It produces about 130 alkaloids such as reserpine, vinceine, raubasin and ajmalcine. Anti-leukemic activity is shown by vinblastine and vincristine. Different parts of this plant produce different amounts of alkaloids, out of which root bark produces the maximum i.e. nearly 1.79%. There are a number of reports supporting its anti-microbial activity against Staphylococcus albusi, Bacillus megatarium, Shigella, Pseudomonas, etc. Its anti-oxidant and antimutagenic effects have also been reported. Further studies Its anti-oxidant and antimutagenic effects have also been reported. Further studies need to be done to explore its anti-tumour effectsneed to be doneexplore its anti-tumour effects. Catharanthus roseus is one of the important medicinal herb with numerous biological properties. Lot of work is still in process to identify new bioactive compounds, understanding the methodology of transformation of bioactive compounds in one form to another form, new extraction technique such as green extraction and improving the drying method such as solar drying.

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