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A scientific review on *Sadaphuli* in Ayurveda

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ABSTRACT

Sadaphuli is a small shrub found everywhere in Indian gardens. It has flowers throughout the year and so it is called as Sadabahar. *Catharanthus roseus* natively called as "Periwinkle" in English is a common ornamental plant grown in the gardens of residential and official compounds. The (Periwinkle) Sadabahar is believed to be native of the West Indies but was originally described from Madagascar. It is cultivated as an ornamental plant almost throughout the tropical and subtropical area. It has been used internally for hypertension, loss of memory, Cystitis and gastritis, raised blood sugar levels, and diarrhoea. Traditionally this drug is used for Diabetes, Hypertension, Cardiac disease, Dysmenorrhoea etc. In India and other countries, it is commonly available varieties of *Catharanthus* (*Sadabahar*) are with red and white flowers. *Catharanthus* is a rich source of alkaloids, which gives the scientific platform to this drug as it contains Vincristine, Vinblastine etc.

Key words: *Sadaphuli*, *Catharanthus roseus*, *Aushadha*, *Rasapanchaka*.

INTRODUCTION

Ayurveda is traditional health care system using various plant drugs is successful from very early times in various disorders for healthy life and longevity.^[1] The knowledge about medicinal plants in the early period was documented systematically and organized scientifically in various Ayurvedic Samhitas, Nighantus. *Aushadha* is also known as *Bheshaja* and it plays an important role in treatment of all the eight branches of Ayurveda. Plants which have one or more of its organs containing substances that can be used for the therapeutic purpose, are called medicinal plants.^[2] *Catharanthus roseus* natively called as "Periwinkle" in English is a common ornamental plant grown in the gardens of residential and official

compounds. This is a small shrub found everywhere in Indian gardens. It has flowers throughout the year and so it is called as Sadabahar. Drought stops the growth of plants but it does not seem to affect *Vinca* which remains green and flourishing when everything else is withering for want of water. It grows up to 75 cm high becoming sub woody at the base and profusely branched.^[3] It also has been used internally for hypertension, loss of memory, Cystitis and gastritis, raised blood sugar levels, and diarrhoea.^[4] This plant produces a diverse array of secondary metabolites that are pharmaceutically important and used as chemotherapeutic agents in the treatment of several types of cancers.^[5]

OBJECTIVES

To critical review on Pharmacodynamic action and therapeutic uses of *Sadaphuli* (*Catharanthus roseus*).

METHODOLOGY

Source of Data: Conceptual review of *Sadaphuli* has been done from Various *Nighantus* and Ayurvedic Pharmacopeia of India (API) and other classical Ayurveda books, published paper in international journals. Information regarding the drug *Sadaphuli* is also collected from available e-Nighantus.

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REVIEW ON SADABAHAR

Taxonomic Position of the Plant *Sadabahar*:^[6]

- Kingdom - Plantae
- Division - Phanerogamae
- Class - Dicotyledonae
- Subclass - Gamopetalae
- Series - Bicarpellatae
- Order - Gentianales
- Family - Apocynaceae
- Genus - *Catharanthus*
- Species - *Roseus* (L)



Figure 1: *Sadafuli, Catharanthus roseus*

Origin and Distribution

The (Periwinkle) *Sadabahar* is believed to be native of the West Indies but was originally described from Madagascar. It is cultivated as an ornamental plant almost throughout the tropical and subtropical area. It is abundantly naturalized in many regions, particularly in acid coastal locations. The plant *Sadabahar* (*Catharanthus*) is an erect, bushy perennial herb of the Apocynaceae family, it grows up to 75 cm high becoming sub-woody at the base and profusely branched, the stems containing some milky latex, leaves are opposite in pairs, smooth, oblong-oval, blunt or rounded at the apex, 2.5 to 9 cm long and 1.5 to 4 cm wide, short petioled. Flowers borne

throughout the year in upper leaf axils, are tabular, 1.5 to 4 cm long, five lobed, flaring to a width of 5 cm, colour may be white with a yellow eye, white with a crimson eye or lavender pink with a crimson eye.^[7]

Chemical Composition

The plant is a rich source of alkaloids which are distributed in all parts of the plant. The presence of total alkaloids in both varieties of Periwinkles is given in below table no. 1.

The physiologically important alkaloids are the antineoplastic dimeric alkaloids, Vinblastine and vincristine mainly present in the aerial parts. Ajmalicine is mainly obtained by the catalytic hydrogenation of serpentine. The alkaloids isolated from the plant are presented in below table no 2.

Pharmacodynamic properties of *Sadafuli* has been described in table no. 3.

Therapeutic uses of *Sadafuli* ^[9-12]

Antihyperglycemic Activity

Hot water extract of dried entire plant administered by gastric intubation to rats at a dose of 3.0 gm/kg daily for three days was inactive vs alloxan-induced hyperglycaemia.

Antibacterial activity

Benzene extract of dried flowers, at a concentration of 5.0% on agar plate was active on *Proteus*, *Pseudomonas*, *Shigella* and *Staphylococcus* species; inactive on *Salmonella* species, and *Shigella paradysenteriae*. Benzene extract of leaves at a concentration of 5.0% on agar plate was active on *Proteus*, *Pseudomonas*, *Salmonella*, *Shigella* and *Staphylococcus* species. Ethanol (70.0%) extract of dried leaves on agar plate was active on *Bacillus megaterium* and *Staphylococcus albus* and inactive on *Bacillus cereus* and *Staphylococcus aureus*. Ethanol (95%) extract of fresh root on agar plate was active on *Shigella flexneri*, *Streptococcus faecalis*, and *vibrio cholera* and weak activity on *Corpynebacterium diptheriae*, *Diplococcus pneumonia*, *Salmonella paratyphi A*, *Shigell dysenteriae*, and *Staphylococcus aureas*. Ethanol (95%) extract of fresh shoots on agar plate was active on *Corynebacterium diphylococcus*

aureus pneumoniae and staphylococcus aureus, and weak activity on Salmonella paratyphi B. Total alkaloids of root, at a concentration of 500.0 mcg/ml in broth culture was inactive on Escherichia coli, Salmonella typhosa, and Shigella dysenteriae. Water extract of entire plant on agar plate at a concentration of 1:4 was inactive on Salmonella paratyphi A, Salmonella typhosa, Shigella flexneri; weak activity on Escherichia coli, Salmonella Paratyphi B, Staphylococcus aureus, and Vibrio Cholera.

Anti-diuretic Activity

Alkaloid fraction of the entire plant administered subcutaneously to male rats at a dose of 50.0 mg/kg was active.

Anti-fertility effect: Methanol / water (1:1) extract of dried leaf and stem administered orally to male rats was active.

Anti-hypercholesterolemic activity

Hot water extract of dried leaves administered orally to rabbits was active.

Anti-hypertensive Activity

Total alkaloids of root administered intravenously to dogs at a dose of 4.0 mg/kg were active. There was a drop in blood of 40 to 50% for two hours in hypertension produced by slow intravenous epinephrine infusion.

Anti-inflammatory Activity

Ethanol (95%) extract of dried leaves administered intraperitoneally to rats at a dose of 400.0 mg/kg was active. Edema was inhibited 65%.

Anti-malarial Activity

Chloroform extract of root at a dose of 400.0 mg/kg and water extract at a dose of 4.42 gm/kg administered orally to chicken produced weak activity on Plasmodium gallinaceum.

Antiviral activity (plant pathogens)

Water extract of callus tissue in cell culture was active on Tobacco Mosaic virus.

Cardio tonic Activity

Ethanol (70%) extract of leaf and stem administered intravenously to guinea pigs was inactive.

CNS depressant Activity

Total alkaloids of root administered intraperitoneally to rats at a dose of 120.0 mg/kg were active.

DISCUSSION

Catharanthus roseus is one of the important medicinal plants found. Catharanthus is an example of a drug plant which has been introduced into medicine during the last few years. Catharanthus (*Sadabahar*) is an example of a drug plant which has been introduced into medicine during the last few years. Traditionally this drug is used for Diabetes, Hypertension, Cardiac disease, Dysmenorrhoea etc. In India and other countries, it is commonly available varieties of Catharanthus (*Sadabahar*) are with red and white flowers which are botanically identified as *Lochnera rosea* or *Vinca rosea* with red flower variety and *Lochnera alba* or *Vinca alba* with white flower variety. Originally the plant has native of Madagascar but now a days it is available freely throughout the country. Two types of flowers are available. One is white color and the other one is pink color. It is used for the cure of a number of diseases such as diabetes, sore mouth, mouth ulcers, and leukemia. It produces various alkaloids such as reserpine, vinceine, raubasin and ajmalcine. Antileukemic activity is shown by vinblastine and vincristine. Its different parts of this plant produce different amounts of alkaloids.

CONCLUSION

In this era where lots of confusion and controversies are created for correct identity of classical drugs, we have to search a simple remedy available and which fulfilling the criteria of *Sampannata Aushadha* (an ideal drug). Catharanthus (*Sadabahar*) finds no mention in Ayurvedic lexicons. Catharanthus is a reach source of alkaloids, which gives the scientific platform to this drug as it contains Vincristine, Vinblastine, Reserpine group. Further research is needed for its evidence-based drug establishment for therapeutic efficacy.

Table 1: Alkaloid content of different parts of Periwinkle.

Part	Habitat	Pink - flowered cultivar	White - flowered cultivar	Cultivar no indicated
Roots	Jammu	1.08	1.34	1.18
Roots	Trivandrum	-	-	1.22
Roots at Flowering	Pune	-	-	2.57
Root bark	Trivendrum	9.0	4.5	-
Root bark	Lucknow	2.54	3.43	-
Root wood	Lucknow	0.27	0.17	-
Leaves (cultivated, 1-year old)	Jammu	0.82	0.74	-
	Lucknow	0.32	0.38	-
	India	-	-	0.26-0.31
Stems	Lucknow	0.09	0.12	-
	India	-	-	0.005-
Flowers	Malagasy	-	-	0.84
Fruits	Egypt	-	-	0.40
Seeds	Egypt	-	-	0.18
Ref. Wealth of India 1999				

Table 2: Alkaloids of *Catheranthus Roseus*.

Alkaloid	Molecular formula	m p(°C)	Alkaloid	Molecular formula	m p(°C)
Ajmalicine (raubasine, 8-yohimbinc, vinceine, vincainc, tetrahydroscrpnlinc)	C ₂₁ H ₂₄ N ₂ O ₃	253-54	4-Desacetoxy-3'-hydroxyvinblastine ⁵ Dihydrosiurikinc	dimeric C ₂₁ H ₂₈ N ₂ O ₃	— 215
Akuammicinc	C ₂₀ H ₂₂	181-82	Fluorocarpa	C ₂₀ H ₂₂	—

	N ₂ O ₂		mine ¹⁴	N ₂ O ₃	
Akuammine(vin camajoridine)	C ₂₂ H ₂₆ N ₂ O ₄	258-60	Fluorocarpa mine-N-oxide ¹⁴	C ₂₀ H ₂₂ N ₂ O ₄	—
Alstonine	C ₂₁ H ₂₀ N ₂ O ₃	hydrochloridc,	Gomaline ^{6,23b}	C ₂₀ H ₂₂ N ₂ O ₃	—
Ammocalline	C ₁₉ H ₂₂ N ₂	281-82 >335(dc comp)	19-Hydroxytabcrsonine ^{25,23c} Isositsirikinc	C ₂₁ H ₂₄ N ₂ O ₃ C ₂₁ H ₂₆ N ₂ O ₃	sulphate.
Ammorosine	-	221-25			263.5
Amotin	-	—	Z-Isositsirikine, 16-epi- ¹⁶	C ₂₁ H ₂₆ N ₂ O ₃	181
Carosine	C ₄₆ H ₅₆ N ₄ O ₁₀	214-18	Leurosidine-N'b-oxide ¹⁷	C ₄₆ H ₅₈ N ₄ O ₁₀	215-18
Catharanthamine	C ₄₆ H ₅₆ N ₄ O ₉	—	Leurostne(vi nleurosine)	C ₄₆ H ₅₆ N ₄ O ₉	202-05
Catharanthine	C ₂₁ H ₂₄ N ₂ O ₂ H ₂ O	126-28			(dcco mp)
Caiharicinc	C ₄₆ H ₅₂ N ₄ O ₁₀	231-34	Leurosinc, 21'-oxo- ^{19a}	C ₄₆ H ₅₄ N ₄ O ₁₀	212-15
		(dcco mp)	Lcurosinonc ⁷	-	—
Catharine	C ₄₆ H ₅₄ N ₄ O ₁₀	271-75	Leurosivine	C ₄₁ H ₅₄ N ₃ O ₉	sulphate.
Cathovaline	C ₂₄ H ₃₀ N ₂ O ₅	88-90			(deco mp)
Coronaridinc	C ₂₁ H ₂₆ N ₂ O ₂	hydrx: hloridc, 235(dcc omp)	Lochrovicine Lochrovidine	C ₂₀ H ₂₂ N ₂ O ₃ C ₂₂ H ₂₆ N ₂ O ₄	234-38 213-18
Dcaccioxyvinblastine	C ₄₄ H ₅₆ N ₄ O ₇	183-90	Lochrovinc	C ₂₃ H ₃₀ N ₂ O ₃	258-63
Deacetylvincaleukoblastine	C ₄₄ H ₅₆ N ₄ O ₈	sulphate	Maandrosine	-	sulphate,
N-Deformylvincristine	C ₄₆ H ₅₆ N ₄ O ₉	sulphate,			(deco mp)

U.S-Dehydroepimorphine	-	—	Pericathidine	-	(decomp)
N-Demethylvinblastine	C ₄₅ H ₅₆ N ₄ O ₉			-	-
Deoxyvinblastine(isoleurosine)	C ₄₆ H ₅₈ N ₄ O ₈	202-06			
Pericyclivine	C ₂₀ H ₂₂ N ₂ O ₂	228	Vincadioline	C ₄₆ H ₅₈ N ₄ O ₁₀	—
Perimivine	C ₂₁ H ₂₂ N ₂ O ₄	292-93	Vincaline II	-	165-67(bp)
Perivine	C ₂₀ H ₂₄ N ₂ O ₃	180-81	Vincarodine	C ₂₂ H ₂₆ N ₂ O ₅	235-38
Perosine	-	sulphate,			(decomp)
Pteiocarpamine	C ₂₀ H ₂₂ N ₂ O ₂	159			320(decomp)
Pteurosine (leurosine -)	C ₄₆ H ₅₆ N ₄ O ₁₀	191-94	Vincolidine	C ₂₃ H ₂₆ N ₂ O ₃	165-70
Pseudovinblastinediol	C ₄₄ H ₅₆ N ₄ O ₈	—	Vincoside	C ₂₇ H ₃₄ N ₂ O ₉	-
Rcserpine	C ₃₃ H ₄₀ N ₂ O ₉	264-65	Vincristine (Icurocrisline)	C ₄₆ H ₅₆ N ₄ O ₁₀	218-20
Rhazimol	C ₂₁ H ₂₄ N ₂ O ₃	—	vincalurocristine		(decomp)
Rosamine	C ₂₁ H ₂₄ N ₂ O ₃	amorph	Vincubine	C ₉ H ₁₇ N O	—
Roseadine	-	—	Vindolicine	C ₅₁ H ₆₆ N ₄ O ₁₂	265-76
Rosicine	C ₁₉ H ₂₀ N ₂ O ₃	—	Vindolidine	C ₄₈ H ₆₄ N ₄ O ₁₀	244-50
Rovidine	-	sulphate			(decomp)
Serpentine	C ₂₁ H ₂₂ N ₂ O ₃	156-57			210-13 (decomp)

Sitsirikine	C ₂₁ H ₂₆ N ₂ O ₃	239-41	Vindolinine-N-oxide	C ₂₁ H ₂₄ N ₂ O ₃	—
Tabereonine	C ₂₁ H ₂₄ N ₂ O ₂	(decomp) hydrochloride 196-98	19S-Vindolmine 19S-Vindolinine-N-oxide	C ₂₁ H ₂₄ N ₂ O ₂ C ₂₁ H ₂₄ N ₂ O ₃	200 -
		(decomp)	Vindorosine (demethoxy)	C ₂₄ H ₃₀ N ₂ O ₅	167
Tetrahydroalstonine	C ₂₁ H ₂₄ N ₂ O ₃	230-31	vindoline)		
Venalstonine	C ₂₁ H ₂₄ N ₂ O ₂	140-42	Vinosidine	C ₄₄ H ₅₂ N ₄ O ₁₀	253-57
Vinamidine(catharinine)	C ₄₆ H ₅₆ N ₄ O ₁₀	amorph	Vinsedine	mol wt 780	(decomp) 206
Vinaphamine	-	229-35	Vinsedine	mol wt 778	198-200
Vinaspine	-	235-38	Virosine	C ₂₂ H ₂₆ N ₂ O ₄	258-61 (decomp)

Table 3: Rasapanchaka^[8]

Rasapanchaka	Lochnera rosea	Lochnera alba
Rasa	Tikta	Tikta
Guna	Laghu, Ruksha, Sheeta	Laghu, Ruksha, Sheeta
Virya	Sheeta	Sheeta
Vipaka	Katu	Katu

REFERENCES

- Sharma PV. Ayurveda ka Vajnanikaltihasa Abridged edition. Varanasi; Chaukhambha orientalia. 4th edition 2001, p-13.
- Sofowora A. Medicinal Plants and Traditional in Africa. Chichester John Wiley and Sons, New York. 1993;p-97-145.
- PKK Nair. Glimpses in plant research. V-4, 1979,p160.

4. Dr Hemamalini Balaji. Versatile Therapeutic effects of *Vinca rosea* Linn. International Journal of Pharmaceutical Science and Health Care. 2014;4(1):59-76
5. Senthilraja P, Kayitare John, Manivel G, Manikandaprabhu S, Anand Krishnamurthy. Potential compound derived from *Catharanthus roseus* to inhibit non-small cell lung cancer (NSCLC). Int J Res Ayurveda Pharm. 2015;6(2):265-271
6. Nejat N, Valdiani A, Cahill D, Tan Y, Maziah M, Abiri R. Ornamental Exterior versus Therapeutic Interior of Madagascar Periwinkle (*Catharanthus roseus*): The Two Faces of a Versatile Herb. The Scientific World Journal. 2015;1-19
7. Sain M, Sharma V. *Catharanthus roseus* (An anticancerous drug yielding plant) - A Review of Potential Therapeutic Properties. Int J Pure App Biosci. 2013;1(6):139-142.
8. Yadavaji Trikamji Acharya (ed). Sushruta Samhita. Varanasi: Chaukhamba Orientalia. 7th edition, 2002;207-8 verse 45/132-142.
9. Asma Nisar, Awang Soh Mamat, Md Irfan Hatim, Muhammad Shahzad Aslam, Muhammad Syarhabil Ahmad. Phytochemical and pharmacognostic study of *Catharanthus roseus* using deep eutectic solvents. Int J Res Ayurveda Pharm. Jul-Aug 2016;7(Suppl 3):141-146.
10. Punia Sandeep, Kaur Jagjit, Kumar Raman and Kumar Kuldeep. *Catharanthus roseus*: A medicinal plant with potent Anti-tumor properties. Int J Res Ayurveda Pharm. 2014;5(6):652-656.
11. M Santhosh Aruna, M Surya Prabha, N Santhi Priya, Ramarao Nadendla. *Catharanthus Roseus*: Ornamental Plant is now Medicinal Boutique. Journal of Drug Delivery & Therapeutics. 2015; 5(3):1-4.
12. S Satish, DC Mohana, MP Ranhavendra, KA Raveesha. Antifungal activity of some plant extracts against important seed borne pathogens of *Aspergillus*. J of Agricultural Technology. 2009;3:109-119.

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