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Antibacterial Activity of the Roots of Medicinal Plant Catharanthus roseus (L)

Komal Tikariya[1], Rajat Pawar [2], Nisha Mandloi [3], Shivam Soni [4], Kamna Tripathi [5], Rinku Dhakad [6], Shikha Nagle bhati [7], Chanchal Navin Raj [8]

BM College of Pharmaceutical Education and Research, Indore[1]

Swami Vivekanand College of Pharmacy, Indore[2,7]

Faculty of Pharmacy, Medicaps University, Indore[3]

Shri Bherulal Pharmacy Institute, Indore[4]

Indus institute of Pharmacy and Research, Ahmadabad

NMT Gujrati College of Pharmacy, Indore[6]

Shri DD Vispute College of Pharmacy and Reasearch Center, New Panvel, Maharashtra, India[8]

Correspondence Author: **Komal Tikariya**

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ABSTRACT

Medicinal plants have been used in healthcare since time immemorial. Studies have been carried out globally to verify their efficacy and some of the findings have led to the production of plant-based herbal medicines. Many of these herbal medicines have beneficial effects on long- term health when consumed by humans, and can be used to effectively treat human diseases. Thepresent study aimedat, phytochemical screening, Antioxidant activity of ethanolic extract at varying concentration invitroand biological studies of the medicinal plant *Cantharanthus roseus (L*). This plant are very less explored and found in particular region, while large number of plants from this genera have been studied and proven to have number of phytoconstituents and biological activities. The phytochemical screening of Plant roots extract showed the presence of phytochemically active compounds such as tannin, flavonoids, steroids, terpenoids, triterpeniods, alkaloids, anthraquinones, polyphenol,glycosides in higher percentage. The antibacterial studies on the ethanolic extract of plant name *Cantharanthus roseus(L*) have been carried out six pathogenic bacteria including gram positive and negative. They found to have moderate antibacterial activities.

INTRODUCTION

Catharanthus roseus is one plant recognized well in Ayurvedha. It is an evergreen plant first originated from islands of Madagascar (Jai Narayan mishra, 2017). These herbal products are now a day's safety in contrast to the synthetic drugs, that are regarded as harmful to human being and our environment. Although herbs had been used traditionally their unique medicinal, flavoring and aromatic qualities in centuries. Due to the number of disorder and irreversible problems recently people are returning back to the natural plant products with hope of safety and security. It's time to promote them globally. Keeping in view, the present study to investigate the phytochemical analysis and in vitro anti-bacterial activity of *Catharanthus roseus L*. roots.The main objectives are to identify the phytochemicals present in the roots extract of *Catharanthus roseus* through qualitatively and tostudy the in vitro Antibacterial activity of the medicinal plant *Catharanthus roseus* of roots extract.

Materials and Methods

Details choose plants

a) Taxonomy details:
Class: Magnoliopsida. Family: Apocynaceae.
Genus: Cantharanthus.

b) Language:
Telugu: Billaganneru
English: old-maid-flower, rose periwinkle
Hindi: Sadabahar, Baramassi, Ainskati, Ushamanjairi

c) Medicinal uses:
Cantharanthus roseus is used to cure relieving muscle pain, depression of the central nervous systemIt is also used to cure applying to wasp stings and to heal wounds, diabetes to cure of stomach ache. The plant is exploited and studied as a medicinal plant as it was found to produce more than 100 monoterpenoid indole alkaloids that contain the two major vital cytotoxic dimeric alkaloids that areused cure cancer chemotherapy treatment.It is also used to cure anticancer compounds: Vinblastineand Vincristine (Magnotta, 2006). Its also used to cure alkaloid vincristine has a role for treating leukemia in children.

Fig: 1 *Catharanthus Roseus* (L)

Collection of plant materials

The *Catharanthus roseus (*L). roots was authenticated by Dr. S.N Dwivedi, Head of Department of Botany, Janata PG College, A.P.S.University, Rewa M.P.The collected fresh roots were allowed to shade dried for three days and make a fine powder with the help of mixer grinder.

Preparation of extract

20 gram of *Catharanthus roseus* (L) powder roots mixed with 100 ml of ethanol solvent, the extractshake it well for 10 minutes by free hand and wait for 3 days . After the plant extract was filtered using Whatman No.1 filter paper and filtrate used for further analysis.

Phytochemical screening

Chemical tests were carried out on the extract using standard procedures to identify the constituents as described by Sofowara (1993), Trease and Evans (1989) and Harborne (1984 and 1998).

RESULTS AND DISCUSSION

Phytochemical Screening

The results of the phytochemical screening of the plant *Catharanthus roseus* are presented here. The ethanolic extract of the roots of *Catharanthus roseus* showed the presence of phytochemicallyactive compounds such as tannin, flavonoids, polyphenol and coumarins present in higher quantities (David. M. Pereira., 2010). The presence of metabolites in the extracts is indicated through ' + +'symbol. The metabolite saponin, steroids, terpenoids, triterpenoids, alkaloids, anthraquinones andglycosides that are present in moderate concentration in the extract is indicated through '+'symbol.

The details are given in the below Table:1

Table:1 Qualitative phytochemical analysis of *Catharanthusroseus*

S. No	Phytoconstituents	Ethanolic extract *Catharanthus roseus*
1	Tannin	++
2	Saponin	+
3	Flavonoids	++
4	Steroids	+
5	Terpenoids	+
6	Triterpeniods	+
7	Alkaloids	+
8	Anthraquinones	+
9	Polyphenol	++
10	Glycosides	+
11	Coumarins	++

Note: (+) Presence, (++) High concentrations and (-) Absences

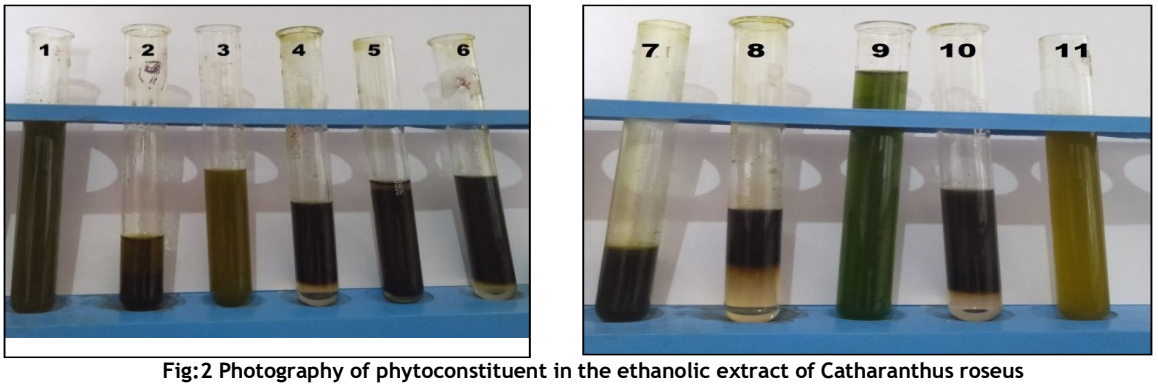


Fig:2 Photography of phytoconstituent in the ethanolic extract of Catharanthus roseus

(Fig:2 1. Tannin, 2.Saponin, 3.Flavonoids, 4.Steroids, 5. Terpenoids, 6. Triterpenoids,7. Alkaloids, 8. Anthraquinones, 9. Polyphenol, 10. Glycoside and 11. Coumarins)

Invitro Antibacterial activity

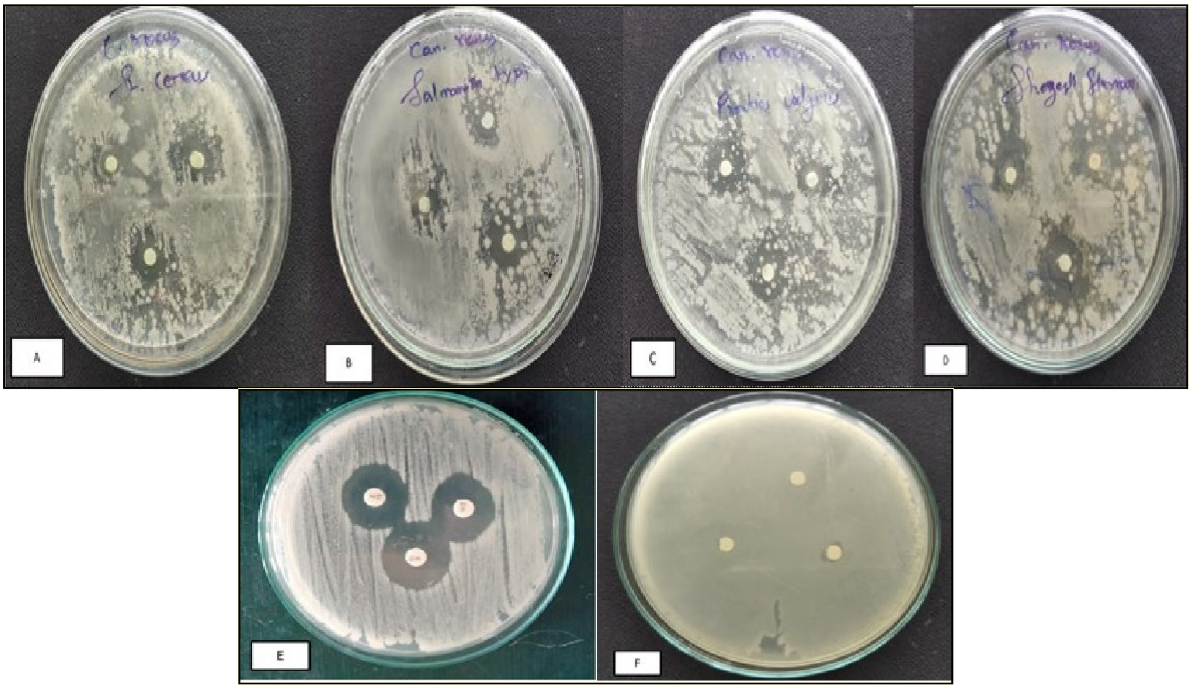
Fig:2 Photography of phyto constituent in the ethanolic extract of Catharanthus roseus

Table: 2 Antibacterial screening of leaf extracts of on pathogenic bacteria by Disc diffusionmethod- *Catharanthus roseus*

Inhibition zone diameter in mm (Mean±SD)				
S.NO	Test Bacteria	Ethanol extract	Positive Control	Percentage(%)
Gram Positive Bacteria				
1	*Staphylococcus lentus*	9±5.19	25.6±0.5	35%
2	*Staphylococcus haemolyticus*	10±5.2	30±0	33%
3	*Staphylococcus aureus*	14±6	19.6±0.5	71%
Gram negative Bacteria				
1	*Salmonella typhi*	11±2.64	21±0	52%
2	*Proteus vulgaris*	11.3±1.15	22±0	51%
3	*Shigellaflexneri*	13.6±1.1	19.6±0.5	69%

Among these six pathogenic bacteria's (Fig:3) the zone inhibition of four bacteria's *Staphylococcus aureus*, *Salmonella typhi*, *Proteus vulgaris* and *Shigella flexneri* similar to the zone inhibition of positive control.

Fig:3 Photography of six pathogenic bacteria's the zone inhibition



A. *Staphylococcus aureus.*
B. *Salmonella typhi.*
C. *Proteus vulgaris.*
D. *Shigella flexneri*
E. *Positive bacteria.*
F. *Negative bacteria*

CONCLUSION

Plants used for traditional medicine contain a wide range of substances that can be used to treat chronic as well as infectious diseases. The medicinal value of the chosen plant *Catharanthus Roseus*
L. roots has not been extensively worked out. Plant based drugs have been used worldwide in traditional medicines for treatment of various diseases Therefore, the present study was to investigate the phytochemical screening and antidiabetic activity of *Catharanthus Roseus* L. roots extract. The phytochemical screening of *Catharanthus roseus* roots extract showed the presence of phytochemically active compounds such as tannin, flavonoids, steroids, terpenoids, triterpeniods, alkaloids, anthraquinones, polyphenol, glycosides and coumarins present in higher percentage.
The In vitro antibacterial activity of *Catharanthus roseus* roots proved by inhibition of chloramphenicol activity. Overall, it can be concluded from the present study that *Catharanthus roseus* roots contains rich source of phyto chemicals and possess potential antibacterial activity. The antibacterial activity of the plant due to the phytochemicals such as phenol, flavonoids, steroids etc present in the *Catharanthus roseus* roots.

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