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Original Research Article

A comparative analysis of Asian medicinal herbs *Catharanthus roseus* and *Vinca alba* based on their antidiabetic, anticancer and turbidimetric antibiotic efficacies

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ABSTRACT

Background: Being on Northern Hemisphere, India is a geographically established country with a large variety of species variation in terms of animals and plants species. According to geographical location, the land barriers in north and the oceanic barriers in east and west region of India made the differences among medicinal plant species being isolated from different areas.
Aim: To isolate the pharmaceutical values of those species for antidiabetic, anticancer and antibiotic potencies are essential for further drug establishments from Catharanthus roseus and *Vinca alba*.
Materials and M ethods: Turbidimetric Assay or Tube Assay method is used to determine antibiotic efficacy against Vinblastine (VLB) and Vincristine (VCR) Reference standards. Bradford assay is used to identify protein content against standard curve. Polysaccharide and Amino acid assay are used to evaluate unknown concentration of dextrose and glycine against known concentration. Presence of alkaloids are tested by Mayer's test. Thin Layer Chromatography is used to assume presence of Amino acids rich in anticancer peptides.
Result: Both leaf and stem extracts of *Catharanthus roseus* and *Vinca alba* are showing significant amount of polysaccharide content, strong protein content, presence of alkaloids, anticancer peptides, hypoglycemic or antidiabetic and antibiotic efficacies.
Conclusion: The medicinal plant species *Catharanthus roseus* and *Vinca alba* are well known to be helpful for the medical, biological, pharmacological and biochemical studies for human benefits. So, the desire of medicinal plant utility is a certain thing from the ancient era, till from "Ayurveda shastra" that intricates the therapeutic capability of *Catharanthus roseus* and *Vinca alba*.

1. Introduction

The chances of availability of medicinal plants are becoming rare day by day due to climatic hazard ness, so for laboratory experiments this is incompatible to study with those plant species with medicinal issues. Plants with medicinal values may be common, rare or extinct, researchers or biologists still doing their preference to value out the importance of medicinal plants. With respect of greater economical values some plant species with medicinal issues are very commonly found throughout the India rather than the rare species.[1] But still many commonly found medicinal plants are in demand in their local region to those medical composition and utility are unknown and unexplained to many research biologists. To make general concern and awareness between local people about the beneficent reasons of medicinal plants is becoming challenging for their unknowing vision and huge meaningless uses of those species. For this unconscious issues people need to be developed from every corner of sight to assure the specific usefulness of medicinal plants.[2]

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The chances or the opportunities to work with medicinal plants are the greater value with the economical and climatic eases made the true concern of our research biologists. The sources of medicinal plant species are still dependant on the local people, so as a native biologist it is easy to nurture with those species and their locality more than a foreign biologist. Also the Indian medicinal plant species are highly recognizable for its medical characteristics in the world of medical history. Medicinal plants throughout the eastern India are more useful for their local habits and weather. In eastern India West Bengal is a diverse region containing mountainous region of northern Himalaya as well as the Gangetic region of southern low land.[3,4] The climatic change in northern area because of high altitude is the reason for growth of cold-stable species and the southern coastal area wetland for growth of moist species and the dry east land for dry species are involved with the climatic evolution.[5]

Those variety of the species are useful for treatment of many uncategorized diseases. The essentiality of knowing proper utility and facts of those medicinal plants is required to the scientists for the stability of disease free treatments. The chemical composition of those plant parts and specificity of their characters are important for making medicines for particular diseases. The climatic barriers also help to accommodate with nature especially for medicinal plant species is being recognized by their growth and adaptation by means of speciation. So, to know about the each and every medicinal plant species potentiality to work with human benefits is not possible under certain limitations and conditions.[6]

It is very important to assume how those plant extract works, how they stabilizes chronic diseases to a recognition of medical history. Those inborn and hereditary diseases also have the true effects of herbal treatment. From the ancient era it has recognizable usefulness for giving forth to elimination of untreatable diseases from any human ancestry.[7–9] Herbal medicines have a special effect on wound treatment, viral treatment etc. as it works like a miracle. For antibacterial treatment and contamination free treatment herbal medicines have effective resistance in compare to other chemically eliminating reagents. So, herbal treatment shows a greater value from early stage of civilization without any side effects or intellectual obstacles that can hamper human physiology.[10,11]

Towards, the starting of medicinal plants study we need to survey the land of recognition for those species is extremely helpful for a biologist's work of concern. As previously discussed, medicinal plants in West Bengal are in demand also involved in our project to redeem our contribution to the journey for medical rejuvenation. Further acclamation of our society to achieve serious welfare among people which can be helpful. Hence, we select a cultivation area like West Bengal for studying or experimenting with a common medicinal plant.[12] The plant known as Nayantara (local name) is very frequently found throughout the West Bengal. The two types of Periwinkle plants known as violet Periwinkle (*Catharanthus roseus*) and white Periwinkle (*Vinca alba*) are the two species accordingly found in Bengal. Those plant species are extremely helpful for my research work, that they can be experimented effortlessly for easy availability.[13] My research is a measurable application based experiment to make the Periwinkle plant extremely helpful for the antibiotic, anticancer and diabetes mellitus treatment among other divergent plant species. The both plant species shows very clear and distinct immunogenic effects on diabetes mellitus.[14,15] As the both species are very affordable, accessible and available in our country so, for the making of antidiabetic medicines is thoroughly acceptable. For drug safety and cause of drug delicacy for a particular disease it has to be approved not only under laboratory environment but also under National Drug Safety Council.[16,17]

In a background of social biology in compare to dependence upon chemically defined medicines, the herbal sources of treatment against diabetes mellitus should be well accepted. After the Periwinkle plants species will be ascertained as a critically demandable medicinal plant then a huge population need to find the sources of being criticized about the disease controllable facts.[18,19] So this is vital to restore all medicinal values and aspects of Periwinkle species by a simple experimental evidence to recreate the medicinal issues among generation for further usefulness. The two species of Periwinkle plants (*Catharanthus roseus* and *Vinca alba*) are extremely helpful for the treatment of a chronic disease diabetes mellitus caused by insulin deficiency, it is a hormone produced by beta cells of pancreatic islets.[4] It leads to hyperglycemia with disturbance in metabolic pathway. In untreated cases severe tissue and vascular damages are observed with common endocrine disorder.[20,21]

Both pancreatic endocrine hormones insulin and glucagon are responsible for controlling adequate blood glucose level in a human body. Beta cells of islets of Langerhans secrets insulin that is responsible for increasing blood sugar level.[22,23] In other way, muscles, red blood cells and adipose tissue cells absorb the blood sugar and accumulate the sugar level at normal. In contrast, alpha cells of pancreatic islets lower the blood glucose level by restoring it during meal and exercise time.[24,25] It stimulates the liver and muscle cells for releasing glucose when in deficit. Diabetes mellitus is categorized in two types: Type1 or Insulin Dependent Diabetes Mellitus (IDDM) and Type2 Non Insulin Dependent Diabetes Mellitus (NIDDM).[26] Type 1 diabetes is responsible for less or no insulin secretory capacity, it needs a replacement therapy of insulin for survival in later stage as it is consequent disease of a childhood stage. Type 2 diabetes caused for

abnormality in insulin secretion and its resistance on an adult stage, over 40 years or more.[27–29] Mainly it occurs in people with increased body weight, obesity, decreased body activity etc. In my way of vision all medicinal plants including Periwinkle should be in emergence to enlarge the scope of medical utility for future incidents is a desirable commitment of my research. In broader aspect, after the treatment of diabetes mellitus, the Periwinkle plants(*Catharanthus roseus* and *Vinca alba*)become more popular then it will be needed to make awareness among general people for being strongly conscious about the values and ethics of a common medicinal plant is a simple action can be taken through my research.[30,31]

2. Materials and Methods

Some materials and methods from a moral background that helped the research based on antidiabetic, antibiotic and anticancer treatment through the utility of medicinal plants are thoroughly discussed. A proper laboratory environment is established by production of a damage free source of equipment and gentle handling of reagents for the standard procedure of determining some derivatives of *Catharanthus roseus* and *Vinca alba*. The required materials are discussed following below:

2.1. Biochemical assay

1. *Preparation of plant extract:* 1gm of fresh leaves and fresh stems of each *Catharanthus roseus* and Vinca alba are weighed on a weighing machine. Each of the four samples are added with 5ml distilled H2O and grinded thoroughly and separately on a mortar pestle. This 4 samples put on 4 separate eppendorf tubes (of 1.5ml or 2ml).
2. *Collection of supernatant:* 4 centrifuge tubes with the sample placed on a centrifuge machine in 10,000 rpm centrifugal force for 10 minutes. After that, about 1ml of supernatant from each tube is collected and put on a separate eppendorf. The precipitate is discarded.
3. *Preparation of Phosphate buffer:* 1M Sodium Phosphate Monobasic Anhydrous [NaH2PO4] (119.98g/mol) acidic in nature is mixed with 20ml distilled water in following calculation:

For 20ml solution: (119.98 * 20 * 0.2) /1000= 0.47gm

So, 0.47gm is mixed thoroughly with 20ml dist. H2O.

1m Sodium Phosphate Dibasic Anhydrous [Na2HPO4] (141.96g/mol) basic in nature is mixed with 20 ml distilled water in following calculation:

For 20ml solution: (141.96 * 20 * 0.2) /1000= 0.56gm

So, 0.56gm is mixed thoroughly with 20ml dist. H2O.

Now, p H of the two solution is checked over p H meter. One is acidic solution about p H 3-4 and another is basic solution about p H 11-12. Then the acidic solution mixed with basic solution by drop wise manner until the p H get neutral or 7.0. After the p H reached to 7.0 the mixing will stop and the newly mixed solution is a phosphate buffer prepared. The solution will kept in a refrigerator for further use.

Then the two assays are performed on these plant extracts, one is *Polysaccharide assay* and another is *Amino acid assay.*

2.1.1. Preparation of Phenol

5% phenol is needed for polysaccharide assay and it is prepared by following calculation:

For 5 samples: (5 /100) * 5= 0.25ml phenol. It is mixed with 2.5ml Sulphuric acid (H2SO4) and kept in refrigerator for further use.

2.1.2. Preparation of Dextrose/ Glucose

5%Dextrose or Glucose stock solution is prepared by following calculation:

2.1.3. For 10ml solution

(5 /100) * 10= 0.5gm Dextrose or Glucose. It is mixed with 10ml dist. H2O.

2.1.4. Preparation of Ethanol

50% Ethanol is prepared by following calculation:

For 5 samples: (50 /100) * 5= 2.5ml Ethanol. It is mixed with 5ml dist. H2O.

2.2. Glycine stock solution preparation:

500ml of 2 5M Glycine is prepared by following calculation:

(93.8 * 1) /500= 0.1876gm glycine required for 1 ml distilled water. But for making it more diluted 0.1876gm glycine mixed with 10ml dist. H2O.

2.3. Ninhydrin stock solution preparation

8% Ninhydrin stock solution is prepared by following calculation:

2.4. For 5ml stock solution

(8 /100) * 5= 0.4gm ninhydrin is required. It is mixed with 5ml acetone.

2.4.1. Sample preparation

1gm of leaves and stems of each plant *Catharanthus roseus* and *Vinca alba* are weighed on weighing machine. Then these are separately grinded with a mortar pestle by addition of 5ml distilled H2O. Then 4 samples are put on separate eppendorf tubes (of 1.5ml or 2ml). 4 centrifuge tubes then put on a centrifuge machine in 10,000rpm centrifugal force for 10 minutes. After that, about 1ml of supernatant is collected from each tube and stored on

separate eppendorfs. The precipitation will discarded. Then, 20ml phosphate buffer is prepared with the help of acidic Sodium Phosphate Monobasic Anhydrous [NaH2PO4] and basic Sodium Phosphate Dibasic Anhydrous [Na2HPO4].

2.4.2. Polysaccharide assay

In 30μl of each four extract 470μl of phosphate buffer was added followed by addition of 500μl of 5% phenol and 2.5ml of sulphuric acid (H2SO4)(Figure 1). Then the solution was incubated for 30 minutes. Then a polysaccharide 5% dextrose or glucose stock solution is made and then serial dilution takes place. After that, each test tubes are added with 500μl of 5% phenol and 2.5ml of sulphuric acid (H2SO4) and incubated for 30 minutes. Then the absorbance of each 4 sample and the dextrose concentration was made by using spectrophotometer at 488nm. And a calibration curve was prepared by using dextrose as a standard.

2.4.3. Amino acid assay

In 100μl of each four extract, 100μl ninhydrin and 100 μl 50% ethanol was added and mixed well (Figure 1). The samples were then kept in a water bath (80°C) for 15 minutes. The samples were taken out of the water bath and 2ml of distilled water was added to each of the tubes. After that, an amino acid glycine stock solution was prepared and serial dilution takes place. Then, each test tubes are added with 100μl ninhydrin and 100μl of 50% ethanol and mixed well. After that, these were kept in water bath (80°C) for 15 minutes and then each tube was added by 2ml of distilled water. Then the absorbance of each 4 sample and the glycine concentration was made by using spectrophotometer at 570nm. And a calibration curve was prepared by using glycine as a standard. After that, the optical density (O.D) values were plotted on a graph in excel mode to create the relation between the sample concentration using a standard curve.

2.5. Protein estimation

Bradford Assay: 100 μl of each four samples of raw leafs and stems of *Catharanthus roseus* and *Vinca alba* are mixed thoroughly with 400 μl of demineralized water and 2.5 ml of Bradford reagent. After 10 to 15 minutes of incubation O.D is taken at 595 nm wavelength (Figure 2).

2.6. Estimation of alkaloids

Mayer's Test: Each of the four samples of raw leafs and stems of *Catharanthus roseus* and *Vinca alba* are taken in separate test tube. Each sample is taken as 2ml of extract and mixed with 2ml of concentrated HCl and then added by Mayer's reagent in a drop-wise manner until creamy precipitates have been produced (Figure 3).

2.7. Antibiotic Assay

1. **Sample Preparation:** 1 gm of *Catharanthus roseus* and *Vinca alba* raw leaves and stems are separately weighed and mixed with 90% Ethanolic extract.
2. **Bacterial Sample:** There are 5 types of bacteria, Escherichia coli, Bacillus cereus, Staphylococcus aureus, Klebsiella pneumonia, Enterobacter clocae are sub-cultured in 5ml of Luria Broth for each bacterial sample.
3. **Turbidimetric Method Assay:** There are four constraints have been selected (Figure 4), one is positive control with 500 μl Acetone mixed with 4.5 ml of each bacteria, second is negative control with 5 ml of raw bacteria without acetone, third is experimental sample (Figure 5) and fourth is Reference standard by mixing Vinblastine (VLB) and Vincristine (VCR) with bacterial samples. 4.5ml of bacteria is taken in separate test tube and four samples of raw leafs and stems of *Catharanthus roseus* and *Vinca alba*, Vinblastine and Vincristine are taken separately as 500μl and mixed thoroughly with those bacterial culture to make it a total of 5ml content. Then put them into Rotary shaker cum Incubator for 3 hrs of incubation and after that O.D is measured for each test tube at the wavelength of 600 nm. Then after 60 minutes of interval the O.D is measured repeatedly at the total timespan of 180 minutes (Table 1).
4. **Anticancer properties:** There are 4 types of amino acids Arginine, Histidine, Proline and Tryptophan are taken which are present in high amount in samples where anticancer peptides are rich in content (Figure 6). Also amino acid Leucine is taken as a negative anticancer control which is absent or present in very low content in samples where anticancer peptides are very rich.
5. **Thin Layer Chromatography:** In TLC mobile phase is created by preparing an eluent by mixing of 7 ml Ethanol, 1 ml Ammonia and 2 ml demineralized water. In each TLC paper 4 drops of each sample is put and each amino acid as a control is prepared by adding 0.15g of amino acid in 10ml of demineralized water. Then place those TLC paper in the solvent solution for 20 to 30 minutes. After that 0.02g ninhydrin is mixed with 10 ml demineralized water and sprayed over those TLC plates for fumigation after air-drying it. Then Rf values are measured (Table 2).

3. Results

From the previously discussed experiment it can be interpreted that some following data which is a measurable thought out for establishment of medicinal background of a commonly found ornamental plant. The intellectual contribution of the Periwinkle plants *Catharanthus roseus*

and *Vinca alba* to the antibiotic, antidiabetic and anticancer treatment are found, as the responsible data are mentioned below:

3.1. Biochemical assay

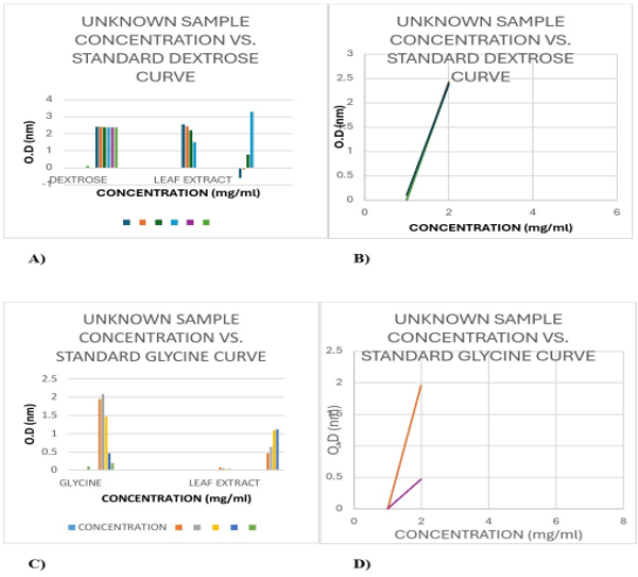

Figure 1: A), B) Polysaccharide Assay and Standard Curve of *Catharanthus roseus* and *Vinca alba*. C), D) Amino Acid Assay and Standard Curve of *Catharanthus roseus* and *Vinca alba*.

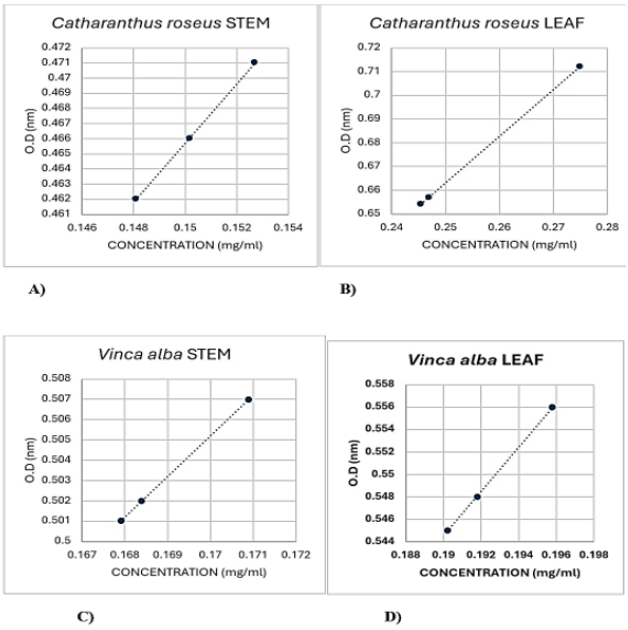

Figure 2: A), B) Bradford Assay of *Catharanthus roseus* Stem and Leaf. C), D) Bradford Assay of *Vinca alba* Stem and Leaf.

3.2. Protein estimation

3.3. Estimation of Alkaloids

3.4. Antibiotic assay

3.5. Anticancer Properties

4. Discussion

The research summarized that it would be more efficient to worth over conventional treatment of diabetes mellitus, cancer and biotic diseases by potential usage of medicinal plants *Catharanthus roseus* and *Vinca alba*. The interpretation over direct and controversial usage of such medicinal plants is discussed below:

As a commonly found herb Catharanthus roseus and *Vinca alba* are the major available medicinal plants around India and throughout Asia. So, they can be useful as enormous medicinal demands and laboratory based research works. The experimental criterion of these two species are very strongly determined and comes forward with traditional, conventional or nonconventional uses by the local people. Such medicinal plants are always a natural blessings, so with largely found natural resources these species are became truly ethically strong and provides high

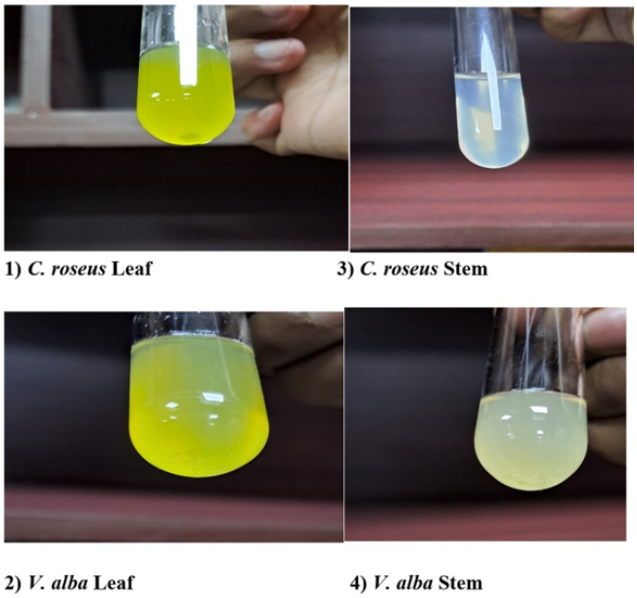

Figure 3: Mayer's test of *catharanthus roseus* and *Vinca alba* Leaf and Stem Extract.

Table 1: A), B) Antibiotic Activity of Bacterial Sample with Acetone (+ve Control) and without Acetone (-ve Control). C), D) Antibiotic Activity of *Catharanthus roseus* Stem and Leaf. E), F) Antibiotic Activity of Vinca alba Stem and Leaf. G), H) Antibiotic Activity of Vinblastine (VLB) and Vincristine (VCR) [Reference Standards]

A) Bacterial Sample (with Acetone)		**O.D (nm)**	
Escherichia coli		0.802	
Bacillus cereus		0.778	
Staphylococcus aureus		0.656	
Klebsiella pneumoniae		0.904	
Enterobacter clocae		0.811	
B) Bacterial Sample (without Acetone)		**O.D (nm)**	
Escherichia coli		1.014	
Bacillus cereus		0.817	
Staphylococcus aureus		0.756	
Klebsiella pneumoniae		1.024	
Enterobacter clocae		0.927	
C) Bacterial Sample	**O.D (nm) (60 min)**	**O.D (nm) (120 min)**	**O.D (nm) (180 min)**
Escherichia coli	0.756	0.003	0.695
Bacillus cereus	0.464	-0.113	0.619
Staphylococcus aureus	0.666	-0.066	0.654
Klebsiella pneumoniae	0.804	0.057	0.715
Enterobacter clocae	0.870	0.123	0.874
D) Bacterial Sample	**O.D (nm) (60 min)**	**O.D (nm) (120 min)**	**O.D (nm) (180 min)**
Escherichia coli	0.845	0.031	0.769
Bacillus cereus	0.680	0.118	0.870
Staphylococcus aureus	0.849	0.181	0.920
Klebsiella pneumoniae	1.044	0.318	1.023
Enterobacter clocae	1.073	0.307	1.017
E) Bacterial Sample	**O.D (nm) (60 min)**	**O.D (nm) (120 min)**	**O.D (nm) (180 min)**
Escherichia coli	0.459	0.115	0.881
Bacillus cereus	0.651	-0.055	0.680
Staphylococcus aureus	0.613	-0.097	0.684
Klebsiella pneumoniae	0.611	1.171	0.906
Enterobacter clocae	0.755	0.119	0.832
F) Bacterial Sample	**O.D (nm) (60 min)**	**O.D (nm) (120 min)**	**O.D (nm) (180 min)**
Escherichia coli	0.796	0.206	0.644
Bacillus cereus	0.800	0.104	0.853
Staphylococcus aureus	0.782	0.083	0.813
Klebsiella pneumoniae	1.038	0.213	0.919
Enterobacter clocae	1.060	0.321	1.045
G) Bacterial Sample	**O.D (nm) (60 min)**	**O.D (nm) (120 min)**	**O.D (nm) (180 min)**
Escherichia coli	0.808	0.154	0.934
Bacillus cereus	0.482	-0.017	0.723
Staphylococcus aureus	0.673	-0.024	0.721
Klebsiella pneumoniae	0.859	0.193	0.940
Enterobacter clocae	0.803	0.100	0.865
H) Bacterial Sample	**O.D (nm) (60 min)**	**O.D (nm) (120 min)**	**O.D (nm) (180 min)**
Escherichia coli	0.862	0.161	0.890
Bacillus cereus	0.717	0.040	0.828
Staphylococcus aureus	0.821	0.070	0.865
Klebsiella pneumoniae	1.034	0.410	1.190
Enterobacter clocae	0.938	0.227	0.999

Table 2: Thin Layer Chromatography of *Catharanthus roseus* and *Vinca alba* Leaf and Stem Extract

	Distance Travelled by Component (cm)	Distance Travelled by Solvent (cm)	Rf Value
Arginine (+Control)	5	7	0.7142
Catharanthus roseus Stem	4.8	7	0.6857
Catharanthus roseus Leaf	3.5	7	0.5
Vinca alba Stem	4	7	0.5714
Vinca alba Leaf	4.3	7	0.6142
Histidine (+Control)	5.2	7.2	0.7222
Catharanthus roseus Stem	5.3	7.2	0.7361
Catharanthus roseus Leaf	5	7.2	0.6944
Vinca alba Stem	5.3	7.2	0.7361
Vinca alba Leaf	5.4	7.2	0.75
Proline (+Control)	5.6	7.5	0.7466
Catharanthus roseus Stem	5.6	7.5	0.7466
Catharanthus roseus Leaf	4.6	7.5	0.6133
Vinca alba Stem	5.4	7.5	0.72
Vinca alba Leaf	5.5	7.5	0.7333
Tryptophan (+Control)	5.5	7.3	0.7534
Catharanthus roseus Stem	5.4	7.3	0.7397
Catharanthus roseus Leaf	5.2	7.3	0.7123
Vinca alba Stem	5.4	7.3	0.7397
Vinca alba Leaf	5.5	7.3	0.7534
Leuciene (-Control)	4.2	6.3	0.6666
Catharanthus roseus Stem	3.7	6.3	0.5873
Catharanthus roseus Leaf	3.7	6.3	0.5873
Vinca alba Stem	4	6.3	0.6349
Vinca alba Leaf	4	6.3	0.6349

throughput values in market. So, the Catharanthus roseus and *Vinca alba* are surely a purposeful plant species that can be negotiable for the treatment of diabetes mellitus, cancer and biotic diseases.

From the true parameter of laboratory conditions it is observed that the dextrose or glucose content of these species are highly recognizable. So, an overview from that corner can be suggestive that the estimation of the polysaccharide content of the species not only help in antidiabetic treatment but also act as a major source of polysaccharides. It is observed that, in diabetes mellitus patients hypersecretion of insulin from pancreatic beta cell of Langerhans causes the excessive release of glucose leading to glucose deficiency in a human body. So, as a major source of a polysaccharides such plant species can be truly efficient for fulfilling the deficiency of glucose in a diabetic patient. But not only for the antidiabetic treatment, and *Vinca alba* are also used for the treatment of cancer. In this disease several inflammation leading to benign tumor and unregulated growth of cells and tissues causes the cancer. So, as a cancer treatment, increasing peptide rich content in the body can suppress the elevation of cancer growth. As an excessive cell proliferation causes the cancer symptoms in patient, then the higher peptide rich content of such plants can also be a curable resource of the certain disease. So, this is a target that not only diabetes mellitus can be curable but also a bunch of disease can be curable by these medicinal plant derivatives.

Another disease caused by biotic sources can also be cured by the derivatives from such plants. Cancer is an incurable disease at all, but lung cancer caused by several intake of carbon di-oxide (CO2), carbon monoxide (CO) and dust or smog particles is a harmful disease of a human also leading to a death. So, by transport of glucose soluble in the body, disease like lung cancer can be temporarily undertaken from being malignant. So, high polysaccharide content of such plants can be a measurable temporary treatment for lung cancer that is also a benefit to that level by the experimental evidence to come out as a medicinal issue of substance. Not only lung cancer, but also endocrine cancer caused by ulceration and allergic syndromes also can be temporarily controllable through high polysaccharide resources. And as these plants have high content of dextrose or glucose also would be effective for that disease, but not only polysaccharides of the species *Catharanthus roseus* and *Vinca alba* but also they have some special derivatives or components accumulated in their body can be a major compromising agents for cancer treatment.

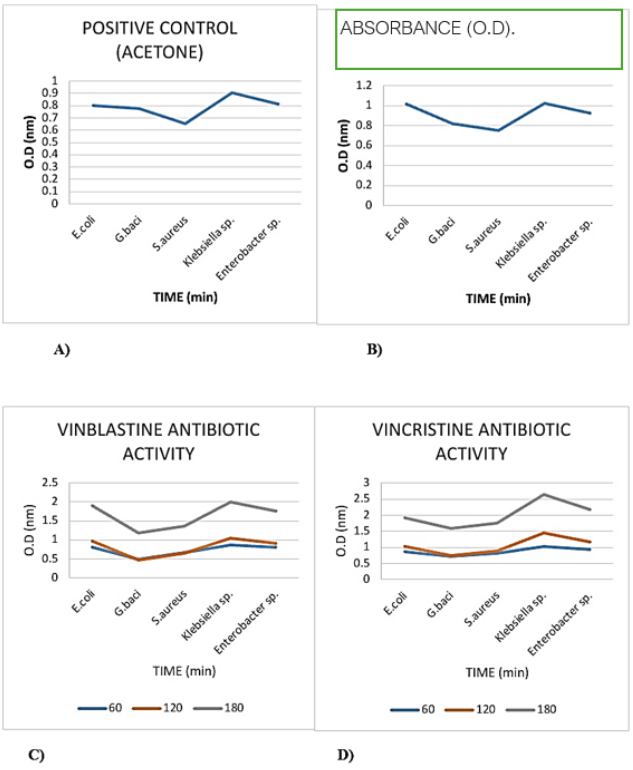

Figure 4: A), B) Antibiotic activity of bacterial sample with acetone (+ve Control) and without acetone (-ve Control). C), D) antibiotic activity of vinblastine (VLB) and vincristine (VCR) [Reference Standards]

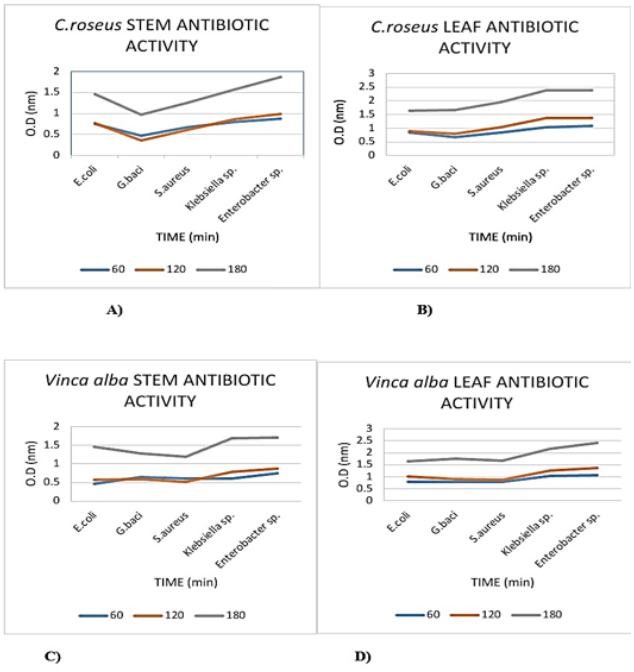

Figure 5: A), B) Antibiotic Activity of *Catharanthus roseus* Stem and Leaf. C), D) Antibiotic Activity of *Vinca alba* Stem and Leaf

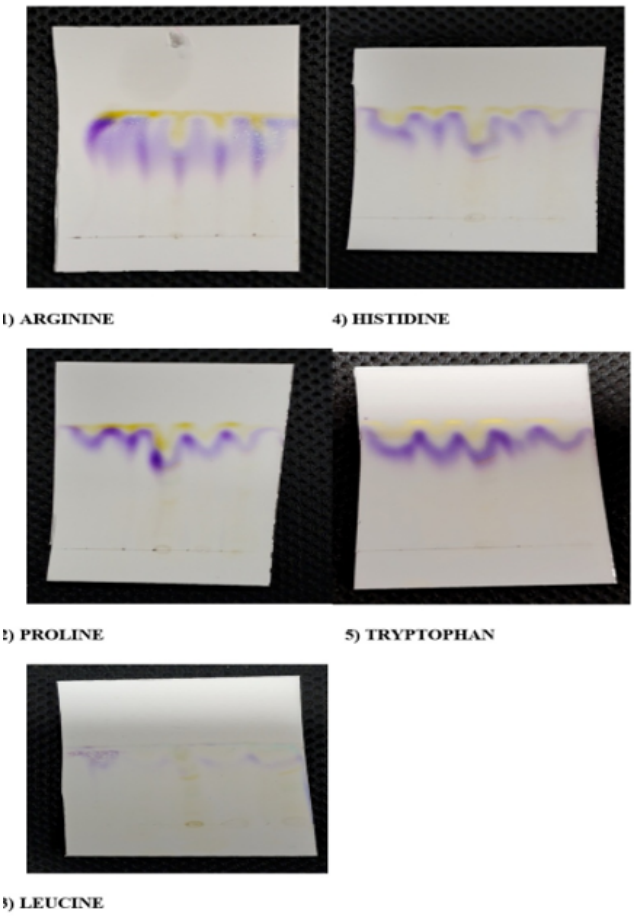

Figure 6: Thin Layer Chromatography of *Catharanthus roseus* and *Vinca alba Leaf* and stem extract

Also for the sterilization process such plant extracts have a prospect to maintaining the sterility of any wound infection, allergy or irritation. The disinfectant properties of these plants also have a mesmerize capability for the categories under medicinal herbs. Now, it can be estimated that the high polysaccharide content of such plants are truly effective for many diseases. But the less amino acid content also has a potency for the treatment of some diseases. As this content is less but not being totally underestimated because of the medicinal property of the plants not only based on the polysaccharides but also the amino acid derivatives are important for the medicinal properties. Amino acids are the building blocks of proteins so less amount of amino acids are also important for the source of proteins and these plants can help in this source of protein in a negligible amount for the diabetic or cancerous patients. So, it concerns about the medicinal efficacy of the species *Catharanthus roseus* and *Vinca alba* and it is subjective to fulfil the aims and objectives in terms of desired laboratory experiments and affordable market value in the society. For the desired laboratory experiments, it should alter all the experimental

conditions and chemical compositions of the reagents to redeem the biochemical capacity for a better medicinal output. And for affordable market price to gain more sources of these plants, convincement to the local people about the ethical and medical values of the species is important. After a general awareness created by people a survey based on all laboratory cum experimental projects should be established by reclaiming the medicinal uses of a commonly found herb *Catharanthus roseus* and *Vinca alba*.

5. Conclusion

The conclusion part has suggested that:

The leaf and stem extract of Periwinkle plants (*Catharanthus roseus*) and (*Vinca alba*) have high polysaccharide content in comparison to standard dextrose concentration. But the Periwinkle plants (*Catharanthus roseus*) and (*Vinca alba*) have very less amount of amino acid content in comparison to standard glycine concentration. So, this proves that Periwinkle plants are the major source of polysaccharides and their hypoglycemic properties are huge acceptable for the treatment of diabetes mellitus.

From the Bradford assay, it is proved that leaf and stem extract of Periwinkle plants (*Catharanthus roseus*) and (*Vinca alba*) have very strong protein content which is a measurable remedy for any anticancer, antidiabetic or antibiotic treatment.

From Mayer's Test it shows comparative amount of alkaloid contents in different plant parts like in leaf and stem of Periwinkle plants. In *Catharanthus roseus* leaf extract the alkaloids are present in very significant amount but in *Catharanthus roseus* stem extract the alkaloids are very less in amount. Similarly, in *Vinca alba* leaf and stem extract both shows moderate amount of alkaloid content.

In the turbidimetric antibiotic assay or tube assay method, it is known that how much turbidity is high, similar to that O.D is also high, which represents the higher amount of antibiotic activities that is present in the sample. In both leaf and stem extract of *Catharanthus roseus* and *Vinca alba* are showing moderate amount of antibiotic activities in comparison to the positive control i.e. acetone treatment. But the leaf and stem extract of *Catharanthus roseus* and *Vinca alba* are showing highest amount of antibiotic activities at the endpoint of 180 minutes and moderate antibiotic activities at the endpoint of 60 minutes and 120 minutes in comparison to Vinblastine (VLB) and Vincristine (VCR) Reference standards.

For anticancer properties, the leaf and stem extract of Periwinkle plants (*Catharanthus roseus*) and (*Vinca alba*) have very rich amount of amino acids like Tryptophan, Histidine and Proline and moderate amount of Arginine but less amount of Leucine which is negligible or absent. It proves that both leaf and stem of Periwinkle plants (*Catharanthus roseus*) and (*Vinca alba*) are rich in anticancer peptides.

6. Ethical Approval

Not needed for this work.

7. Conflicts of Interest

The author has declared no conflicts of interest.

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