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Pallavi
Department of Botany, Patna University, Patna, Bihar, India

RK Mandal
Professor, Department of Botany, Patna University, Patna, Bihar, India

Corresponding Author:
Pallavi
Department of Botany, Patna University, Patna, Bihar, India

Qualitative and quantitative phytochemical analysis and bactericidal activity of *Psoralea Corylifolia* and *Plumbago Zeylanica*

Pallavi and RK Mandal

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Abstract
The beneficial medicinal effects of plant materials typically result from the secondary products present in the plant although, it is usually not attributed to a single compound but a combination of the metabolites. The medicinal actions of plants a unique to a particular plant species or group, consistent with the concept that the combination of secondary products in a particular plant is taxonomically distinct. The screening of plants usually involves several approach; ethno botanical approach is one of the common methods that are employed in choosing the plant for pharmacological study. In the present review paper, antimicrobial study. In the present review paper, antimicrobial properties of various medicinal plants were reviewed. The present review deals with the antibacterial activity of various medicinal plants. The present study investigates the qualitative and quantitative phytoconsituents and bactericidal effect of medicinally important *P. Corylifolia* and *P. Zeylanica*. Preliminary phytochemical screening analysis were determined using standard protocol methods. In addition, antibacterial activities of the leaves extract by disc diffusion method against Gram positive and Gram negative bacteria.

Keywords: Phytochemical screening, primary and secondary metabolities, antibacterial screening *P. Corylifolia* and *P. Zeylanica*

Introduction
In recent years, many plant species have been scientifically evaluated for potential medicinal applications. Traditional medicine systems have become a topic of global importance because they are a rich source of important compounds and are considered safe for human and environmental use. The therapeutic value of plants lies in their phytochemical compounds, which may help in the treatment of human diseases.

Phytochemicals are primary and secondary metabolites naturally present in the leaves and roots of vegetables that provide defense mechanisms and protect against various diseases. The primary metabolites are proteins, carbohydrates, chlorophylls, lipids, and common sugars that are synthesized during photosynthesis, and these organic compounds are essential for the life, growth, and development of plants. Secondary metabolites include tannins, flavonoids, phenols, saponins and alkaloids that are synthesized by plants. During development, it is specific to time, tissue and organ.

Screening of these phytoconstituents may be covered by nitrogenous compounds, acetogens compounds and isoprenoid compounds. These organic compounds allow easy transport across cell membranes to induce various biological activities and physiological activity on the human body. Nitrogenous compounds such as alkaloids and amino acids that are vital to life and perform many functions in metabolism. It is commonly used in food technology and industry. The acetogenin screening included phenolics, flavonoids, tannins, coumarins, emodins, anthocyanidins, anthocyanins, anthraquinones, anthracene derivatives, and fatty acids that exhibit antioxidant, anti-inflammatory, immuno-modulator, anti-tumor, antibacterial activity. Saponins, cardiac glycosides and steroids and carotenoids exert anti-inflammatory activity. In the last few years, plant extracts have been developed to target biologically active compounds and isolates to eliminate pathogenic microorganisms due to the resistance the microorganisms have built up to antibiotics.

Psoralea Corylifolia, commonly known as "Babchi", is a member of the fabaceae family. This is an upright annual plant whose height is 60 to 100 cm. The seeds are surrounded by a sticky, oily pericarp containing psoralein. It is used for cardiac, vasodilator, pigment, antibacterial, cytotoxic and anti-helminthic effects and is used locally for alopecia, albinism, laparoscopy, psoriasis and eczema.

Plumbago Zeylanica, commonly known as Ceylon leadwort plant, doctor's bush or wild leadwort plant (also known as chitrak), is a member of the plumbaginaceae family. *Plumbago Zeylanica* is a perennial shrub that grows 2.5 to 2.5 m. This is the main source of Plumbagin used in traditional herbalism. Indian medicine as an anti-atherogenic agent, heart, liver and nerve tonic. The roots stimulate the central nervous system. The oil prepared from the root is useful for rheumatic joint pain and paralysis.

Therefore, it is desirable to study the phytochemicals of these plants in medicinal plants. Therefore, it is necessary to establish a scientific basis for its therapeutic action, which can serve as a source for the development of effective drugs. Keeping this in mind, efforts are being made to better understand the qualitative and quantitative chemical composition and to investigate the antibacterial activity of organic solvent extracts of *Plumbago Zeylanica* and *Psoralea Corylifolia*.

Materials and Methods

Collection of Plants: Fresh plants leave *P. Corylifolia* and *P. Corylifolia* zeylanica was collected from Patna Botanical Gardens, Bihar, India. The leaves were thoroughly washed with normal tap water and then with sterile distilled water. Then the leaves were dried in the shade at room temperature. The leaves were ground into powder using a grinder. The powder was stored at 4°C in an airtight bottle.

Preparation of solvent extracts for qualitative phytochemical analysis: The ground material of *P. Corylifolia* and *P. Zeylanica* was filled in the thimble and extracted successfully with 250ml of methanol using soxhlet extractor for 32h at a temperature not exceeding boiling point of the solvent for each extraction. For aqueous extraction the content where kept in Shaker at 37 degree centigrade for 24 hours. All the extracts where the filtered using Whattman No 1 filter paper and then concentrated in vacuum 40°c using rotary evaporator.

Qualitative analysis of phytochemical screening: The extracts where subjected to phytochemical screening to test presence of metabolites such as flavonoids, phenol, tannins, saponins, reducing sugar glycosides where qualitatively analysed.

Quantitative analysis of metabolites: Primary metabolites are compounds synthesized in plants that are directly involved in normal growth, development and reproduction and provide an idea of the nutritional potential of plant parts. Primary metabolites such as protein, carbohydrate, chlorophyll, and lipids were determined according to standard methods. Testing the properties of plants and evaluating their potential for use in industry. The content of total phenols was determined using Foline ciocalteu method. Flavonoids were estimated following an aluminum chloride colorimetric method.

Antibacterial activity: The efficacy of extract of *P. Corylifolia* and *P. Zeylanica* leaves were evaluated against staphylococcus aureus, E. coli, bacillus, streptococcus using disc diffusion method. Muller-Hinton Agar plates were inoculated eighth different bacterial strain and sterile whatman filter paper disc (3mm) were containing different extract of *P. Zeylanica* and *P. Corylifolia* sterile discs were placed on the plates and the plates were incubated at 37°C for 24 hr in an incubator and observe zone of inhibition.

Statistical analysis: The result were expressed in mean+- standard deviation. The statistical analysis was performed using Graphpad prism 6.0. All the assay were performed in triplicate.

Results

Qualitative and quantitative analysis: In the present study of primary metabolites of different solvent *P. Corylifolia* and *Plumbago Zeylanica* were qualitatively analysed. The extract of *Plumbago Zeylanica* and *P. Corylifolia* showed diverse phyto profile with reference to the solvent. In the case of methanolic extract of P. Corylifolia, contains tannins,phenol, glycosides, steroids terpenoid, reducing sugar, flavonoids, alkaloids were present and methonolic extract of *Plumbago Zeylanica* contains saponin,phenol, glycosides, flavonoids, tannins, steroids, terpenoid, alkaloids, reducing sugar were present. Whereas aqueous extract showed presence of flavonoids, saponins, steroid, glycosides, terpenoid and reducing sugar and in aqueous solvent of *P. Zeylanica* presence of tannin, saponin glycoside, stero, steroid, terpenoid, flavonoid alkaloids in (Table 1.1 and Table 1.2) respectively. The presence and absence of the phyto constituents depend on the solvent medium used for extraction and the physiological property of individual taxa.

Table 1.1: Phytochemical analysis conducted in different extract of P. Corylifolia

S. No.	Phytochemicals	Methanolic extract	Aqueous extract
1	Tannins (Braymer's test)	+	+
2	Flavonoids (Alkaline reagent test)	+	+
3	Phenolics (Ferric chloride test)	+	+
4	Saponins (Foam test)	-	-
5	Terpenoids (Salkowki's test)	+	+
6	Streiods (Liebermann-Burchard test)	+	+
7	Gylosides (Liebermann's test)	-	+
8	Reducing sugar (Benedict's test)	+	+
9	Alkaloid (Wagner's regent)	+	+

Table 1.2: Phytochemical analysis conducted in different extract of *P. Zeylanica*

S. No.	Phytochemicals	Methanolic extract	Aqueous extract
1	Tannins (Braymer's test)	-	+
2	Flavonoids (Alkaline reagent test)	+	+
3	Phenolics (Ferric chloride test)	+	+
4	Saponins (Foam test)	+	+
5	Terpenoids (Salkowki's test)	+	+
6	Streiods (Liebermann-Burchard test)	+	+
7	Gylosides (Liebermann's test)	+	+
8	Reducing sugar (Benedict's test)	+	+
9	Alkaloid (Wagner's regent)	+	+

Table 2.1: Quantification of Secondary metabolites of P. Corylifolia

Secondary Metabolites	Methanolic extract	Aqueous extract
Total Phenolic contents (GAE mg/gm)	74.35±0.70	1.48±0.55
Total Flavoind contents (QE mg/gm)	60.63±0.66	0.47±0.26

Table 2.2: Quantification of Secondary metabolites of *P. Zeylanica*

Secondary Metabolites	Methanolic extract	Aqueous extract
Total Phenolic contents (GAE mg/gm)	28.25±0.01	0.68±0.02
Total Flavoind contents (QE mg/gm)	2.41±0.02	0.87±0.05

Bacterial resistance of *P. Corylifolia* and *P. Zeylanica*: The possibility of producing antimicrobial drugs from higher plants seems to be useful because it can lead to the production of botanical drugs that act against microorganisms. The antibacterial activity of plant extracts showed an inhibitory effect against S. Aureuns, Escherichia coli, Bacillus and Streptococcus, which depends not only on the tested microorganisms but also on the solvent used for extraction.

Table 3.1: Minimum inhibitory concentration (MICs) of different solvent extract of P. Corylifolia

Tested organisms	Zone of inhibition (mm)	
	Aqueous extract	Methanolic extract
S. aureus	-	14.6
E.coli	9.2	10.6
Bacillius	9	15.1
Streptococcus	8.5	12.2

Table 3.2: Minimum inhibitory concentration (MICs) of different solvent extract of *P. Zeylanica*

Tested organisms	Zone of inhibition (mm)	
	Aqueous extract	Methanolic extract
S. aureus	11.8	14.5
E.coli	10.1	12.4
Bacillius	-	10.2
Streptococcus	13	11

Discussion

Preliminary phytochemical screening of medicinal plants is important to identify bioactive components, which are new sources of compounds of therapeutic and industrial value that can lead to drug discovery and development. Extraction is a key step in extracting desired chemical compounds from plant materials using polar and non-polar solvents. Quantitative evaluation is an important parameter in determining the standards of herbal medicines. Ideally, solvent extraction can be a means of providing basic information about the quality of pharmaceutical products. Tannins are considered as food from plants and vegetables. Tannins reduce bacterial growth by blocking key enzymes in microbial metabolism, so plants containing the highest levels of tannins can act as.

Conclusion

Therefore, this result indicates that *P. Corylifolia* and P. Zeylanic contain more effective substances such as carbohydrates, proteins, lipids, phenols, flavonoids and tannins and these plant compounds are effective against various diseases. The drug is encouraged and helps to increase the better value of *P. Corylifolia* and P. Zeylanic. This study will provide preliminary scientific evidence for herbal and traditional uses of *P. Corylifolia* and *P. Zeylanica*. In addition, biological testing is needed to search for the active parts of the methanolic extracts of these plants and to determine the ultimate activity and toxicity of access.

Conflicts of Interests: Declare None

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