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COMPARATIVE SCREENING ON PHYTOCHEMICAL ANALYSIS OF *AZADIRACTA INDICA*(NEEM) AND *CITRUS LIMON*(LEMON)

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ABSTRACT

Plants such as Neem (*Azadirachta indica*) and Lemon (*Citrus limon*) leaves contain phytochemicals, which may not have nutritional value but can help to prevent disease. There existence of phytochemicals was investigated utilising qualitative and quantitative methods with various solvents such as petroleum ether, ethyl acetate, chloroform, benzene, and water. Proteins, carbohydrates, phenols and tannins, flavonoids, saponins glycosides, steroids, terpenoids, alkaloids, Phlobatannins fixed oil, and fatty acids are among the phytochemicals tested. Folin-Ciocalteu reagent was used to determine the quantity of phenol in the aqueous extract. To evaluate flavonoid concentration, the aluminium chloride colorimetric method was utilised with certain modifications.

Keywords: *Citrus Limon, Azadirachta Indica*, Phytochemical Screening.

I. INTRODUCTION

Introduction Neem (*Azadirachta indica*) (Meliaceae) is a plant that is commonly referred to as Neem. It's found all over the world and has a lot of medical value (Verkerk R. H. J., 1993). Many biologically active substances can be derived from Neem's chemical constituents, which include alkaloids, flavonoids, and triterpenoids, phenolic compounds, carotenoids, steroids, and ketones (Verkerk 1993). In meliaceae species (*Azadirachta indica* and melia azadirachta), there are biologically active compounds called limonoids; other bioactive compounds include Nimbidin and Nimbin, which are anti-inflammatory, anti-bacterial, and anti- fungal, respectively (Siddiqui and Ali, 1997). Beneficial insects are unaffected by *Azadirachta indica*, which only affects insects that feed on plants treated with these leaves (Khanna, 2001). *Azadirachta indica* is also good for the environment.

Lemon (*Citrus limon*) is a Rutaceae family traditional medicinal herb. It is grown mostly for its alkaloids, which have anticancer properties, and for its seeds. antimicrobial activity of crude extracts from various components (i.e. Lemon (i.e., leaves, stem, root, and flower) There have been reports of clinically significant bacterial strains. (Kawaii and colleagues, 2000). Citrus' prominence can be attributed to its numerous applications. With 102.64 million tones, the global demand is expanding. entire world production, and it is most likely the largest. Citrus juice output is less than half of that of other fruits. huge volumes of byproduct wastes, such as fruit weight Every year, peels are created (Manthey & Grohmann, 2001).

II. METHODOLOGY

Plant Study and Collection Area: From the house garden, fresh healthy leaves of *Azadirachta indica* (Meliaceae) and Citrus limon (Rutacea) were harvested. Plant material extraction: The leaf of *Azadirachta indica* (Meliaceae) was extracted using a soxhelt apparatus and hot percolation. Fractional extraction was carried out using increasing polarity solvents, commencing with non-polar petroleum ether and ending with polar water. Petroleum Ether, benzene, chloroform, ethyl acetate, and water were the chemicals in the series. Each solvent was extracted for 6 to 7 hours at a temperature that was kept below the boiling point of the solvent in question. Re-extraction concentrated then, which were then filtered using Whatmann no. 1 filter paper and kept in screw cap tubes.

Extraction of leaves

Fresh healthy leaves of *Azadirachta indica* (Meliaceae) and *Citrus limon* (Rutacea) were taken from the home

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garden and cleaned with distilled water for leaf extraction. After that, the leaves were dried in the shade for around 4-5 days. Then, using a mixer grinder, they were ground into a fine powder. A double-layered muslin fabric was used to pack the finely powdered 20 gm. of crude sample for extraction, which was knotted with

III. RESULTS AND DISCUSSION

Phytochemical screening (qualitative test): The extract was evaluated for bioactive components using conventional procedures. Alkaloids-test, Mayer's Flavonoids (Shinoda test, Alkaline reagent test), sugar (Benedict's reagent test), Glycosides (Salkowski's test, Liebermann's test, Keller-Killer test), Phenolic compounds test (Ferric chloride test), etc. Are used for photochemical screening (qualitative test) of plant material.

The quantity of phenol in the aqueous extract was determined using the Folin-Ciocalteu reagent technique with some modifications. 1 ml of plant extract was mixed with 2.5 ml of 10 percent Folin- Ciocalteu reagent and 2 ml of a 2 percent Na2CO3 solution. At room temperature, the resultant mixture was incubated for 15 minutes. The sample's absorbance was measured at 765 nm. To evaluate flavonoid concentration, the aluminium chloride colorimetric method was utilised with certain modifications. 1 ml of sample plant extract was combined with 3 ml of methanol, 0.2 ml of 10% aluminium chloride, 0.2 ml of 1 M potassium acetate, and 5.6 ml of distilled water for 30 minutes at room temperature. At 420 nm, the absorbance was measured. Phytochemical screening (qualitative test): The extract was evaluated for bioactive components using conventional procedures. For photochemical examination (qualitative test).

The phytochemical properties of five Neem and Lemon leaf extracts were investigated and summarised in the following table: 1. The extract contained medically active chemicals, according to the findings.

Quantitative Phytochemical Analysis Tests: Phenolic Content in Total: Table2 illustrates the total phenolic content of five extracts from powdered Neem and Lemon leaves calculated by the Folin- Ciocalteu method, which demonstrates differences in concentrations.

Total Flavonoid Content: Researchers looked at the total flavonoid content of five Neem and Lemon leaf extracts. Table 3 shows the variability in the concentrations obtained.

Table 1. Table showing the results of Qualitative tests

Sr. No.	Test		leaves Extracts				
			Pet. Ether	Benzene	Chloroform	Ethyl Acetate	Water
1	Proteins	Ninhydrin test				+	
2	Carbohydrates	Fehling's test	-	-	+	+	+
		Benedict's test	-	-	+	+	+
		Iodine test	-	+	+	+	+
3	Phenols & Tannins		+	+	+	-	-
4	Flavonoids	Shinoda test	-	+	+	+	+
		Alkaline reagent test	+	+	++	+	+
5	Saponins		+	+	+	++	+
6	Glycosides	Liebermann's test	-	+	+	-	-
		Salkowski's test	-	+	+	-	-
		Keller-Kilani test	-	+	+	-	-

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7	Steroid		-	+	+	-	-
8	Terpenoids		+	-	+	+	+
9	Alkaloids		-	+	+	+	-
10	Fixed oil & Fatty acids	Spot test	-	-	-	-	-
11	Phlobatannins		-	-	-	-	-

In the above table, ++ indicates present in abundance, + indicates present, and - indicates absent/ not observed.

Table 2. Table showing the results of Quantitative tests Total Phenol Concentration in extracts of lemon leaves.

Sr. No.	Leaves Extracts	Concentration in mg/L GAE*
1	Petroleum ether	0.090
2	Benzene	0.080
3	Chloroform	0.100
4	Ethyl Acetate	0.149
5	Water	0.010

*GAE= Gallic Acid Equivalent.

Table 3. Table showing the results of Quantitative tests Total flavonoid Concentration in extracts of lemon leaves.

Sr. No.	Leaves Extracts	Concentration in mg/ml QE*
1	Petroleum ether	0.080
2	Benzene	0.0063
3	Chloroform	0.098
4	Ethyl Acetate	0.0062
5	Water	0.030

*QE= Quercetin Equivalent.

IV. CONCLUSION

Neem (*Azadirachta indica*) and Lemon (*Citrus limon*) leaves are therapeutic herbs used in food and medicine all over the world. Phytochemicals help to increase the number of traditional uses for human wellness. As a result, we concentrated on analysing phytochemicals in (*Azadirachta indica)* and Lemon (*Citrus limon*) leaves using various extracts. Proteins, carbohydrates, phenols, tannins, flavonoids, saponins glycosides, steroids, terpenoids, alkaloids, fixed oils, and fatty acids were found in leaf extracts according to various analyses. This discovery can be used to guide future research into antibiotic activity against various microorganisms and chromatographic assays.

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