NATURAL DYE PREPARATION AND PHYTOCHEMICAL ANALYSIS FROM CITRUS LEAVES

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A B S T R A C T

Lemon leaves are utilized in many cultures throughout the world. The health benefits of citrus leaves have mainly been attributed to the presence of bioactive compounds. Natural dyes are colorants derived from plants, invertebrates or minerals. The present study was carried out to evaluate the phytochemicals present in the leaf powder of citrus. The phytochemical study showed the presence of terpenoids and anthocyanin in all the four solvent extracts. Preliminary analysis of sample citrus leaves shows determination of pH, weight of moisture content as well as the ash content. In this, the optical density was at various wavelength were recorded in all the four solvent extracts. Infrared spectroscopy was done to determine functional groups in molecules.

Keywords: Citrus leaves, Dye Preparation, Phytochemical tests

Table-1: Preliminary Phytochemical Analysis of Citrus Leaves

Test	Aqueous	Alkaline	Acidic	Alcoholic
Alkaloids	-	-	-	+
Flavonoids	-	+	+	-
Steroids	-	+	-	+
Terpenoids	+	+	+	+
Quinones	+	-	-	-
Phenols	+	+	+	+
Starch	+	-	+	-
Anthocyanin	+	+	+	+
Proteins	-	-	-	-
Carbohydrates	-	-	-	-
Cellulose	+	-	+	+

'+' :- Present '-':- Absent

2.4 Optical Density

Spectrometric is the oldest known technique for determination any colour. The intensity of a substance is in direct proportion to its concentration, which is in terms of transmittance. Concentration of various solution can be determine by colorimetric technique. The absorbance of different concentrated solution was recorded.

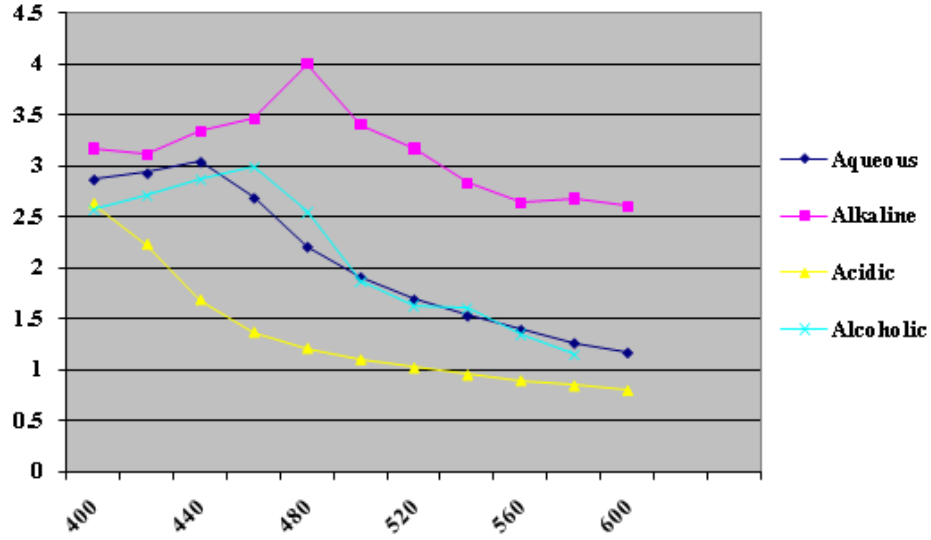

Figure 1: Absorbance of concentrated solution

2.5 IR Spectra

Infrared spectroscopy is the analysis of infrared light interacting with a molecule. This can be analysed in three ways by measuring absorption, emission and reflection. The main use of this technique is in organic and inorganic chemistry. It is used by chemists to determine functional groups in molecules. Approximately 4000-400cm^{-1} may be used to study fundamental vibrations and associated rotational-vibrational structure.

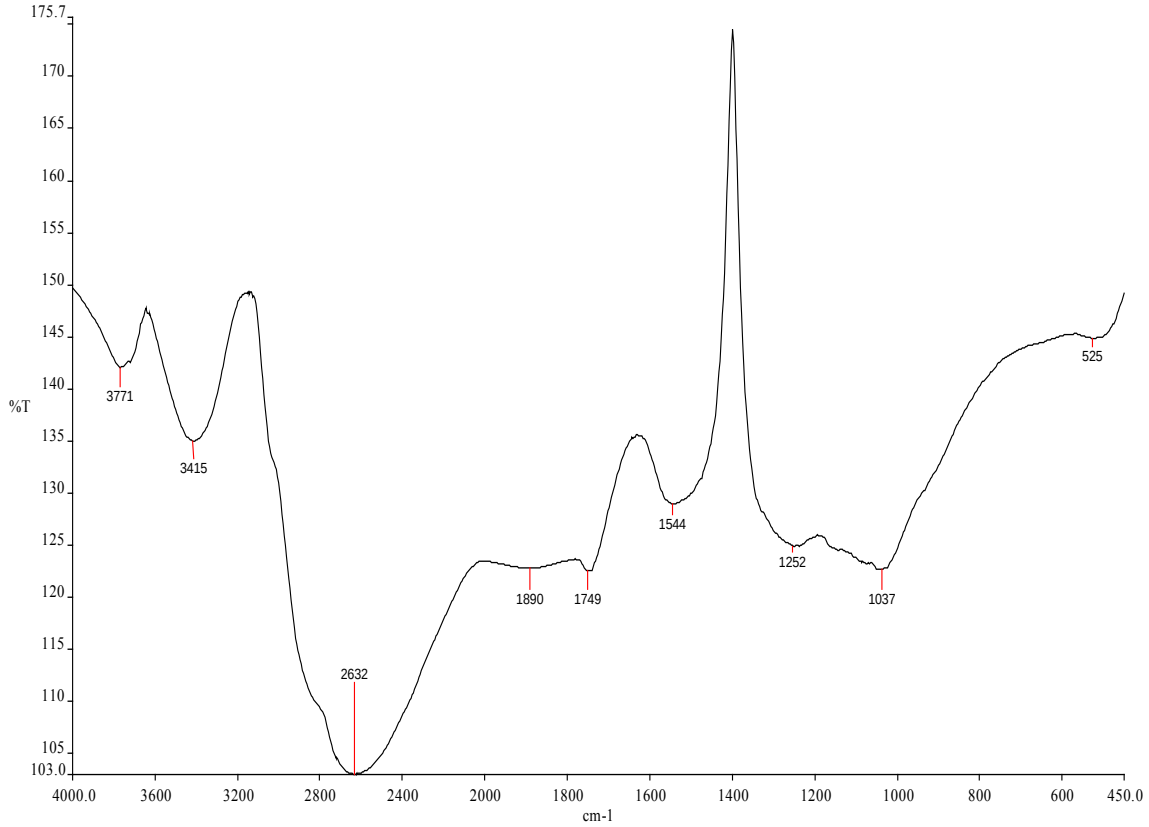

Figure 2: Representative peak in Infrared Spectum

(A) Fresh leaves of citrus plant (B) Dry leaves of citrus plant leave (C) Thin powder of citrus

Figure 3: Collection and processing of Citrus Leaves

3. Result and Discussion

Citrus leaves showed variations and similarities. The leaves are the source of an essential oil, which is used in confectionery, cosmetic and perfumery. They are rich in vitamin C . Lemon leaves were used for dyeing silk fabric. The dyeing of silk can be achieved. It has different mordant and moderating technique.

In the present study, dry leaves of citrus were used for aqueous, alkaline, acidic and alcoholic method. These method give different solvents extract. The fine powder of leaf was analyzed for phytochemical constituents present in it. The leaf powder was dissolved in various solvents and the preliminary phytochemical tests were carried out using Harbone (1984).

The leaf extract were rich in phytochemical activity, as shown in Table 1. In Citrus leaves, terpenoids, phenol and anthocynin were present in all the four different solvent. Whereas, proteins and carbohydrates were absent in all four different solvent.

In today's world artificial dyes predominates the natural dyes because of their fast synthesis and cost of production. But besides that it causes serious effect on environment natural dyes are preferred as it is eco- friendly.

Citrus leaves showed, Peaks in IR spectra and its analysis accordingly

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Peak	Structure
3771	Free O-H group
3415	Intermolecular hydrogen bonded OH Absorption shifts to higher wave number on dilution
2632	Secondary amine (>NH)
1890	Five membered ring (cyclic C=O structure)
1749	Saturated aldehyde C=O structure
1544	C=C and C=N in ring structure
1252	C-O
1037	C-O structure for primary alcohols

4.0 References

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