IJETIR

ISSN (Online) 2583-0554

International Journal of Emerging Technologies and Innovative Research (IJETIR)

Volume 3, Issue 3, March 2023

Impact Factor: 5.731

Extraction and Quantification of Pigments from Indian Traditional Medicinal Plants

Firoj Shaikh, Amanulla Khan, Rahim Bagwan, Javid Khan, Alfiya S. Kureshi,

Department of Botany

Anjuman Islam Janjira Degree College of Science, Murud-Janjira, Maharashtra, India

Abstract: *The pigments which are involved in the process of photosynthesis are called photosynthetic pigments. The pigments are coloured organic compounds. The have capacity to absorb certain wavelength of light and reflect others. According to Maclachlan and Zalic (1953) the chloroplast of higher plants contain four different pigments chlorophyll a ($C_{55}H_{77}O_5N_4$ Mg) and chlorophyll b($C_{55}H_{70}O_6N_4$ Mg) are the green pigments and carotens (C_{40} H_{56}).Chlorophyll benefits the body in a unique and distinctive ways. It is helps to cleanse harmful toxins from the body and it is also uses to fight infection. A recommended and regular intake of chlorophyll can keep the circulatory and digestive systems much healthier. In the present study, the chlorophyll was extracted from the leaves from five medicinal plants and characterized by UV-Visible spectroscopy. Concentration of chlorophyll a and b was calculated using Arnon method. Chlorophyll content was higher in Tecoma stance than other medicinal plants which are used in this study.*

Keywords: Chlorophylls, Carotenoides, Canthiumcoromendelicum, Dalbergiasisoo, Vitexnugundo

I. INTRODUCTION

The photosynthetic pigments Chlorophylls and carotenoids) play and important role in photosynthesis. Chlorophylls are used in preparation of medicines, candles, soaps, tooth paste and oil. The different parts of *Canthiumcoromendelicum* (N Burm) Alstone. used to cure different ailment in human being. The powdered leaves useful for diphtheria, The leaves are diuretic, anthalemintic, and also used against intestinal worm. The powdered leaves useful for cure diabetics in some part of Indo-China. The bark of young branches used as medicine in dysentery. The fruit pulp consists of high carotenoides content. *Vitexnugundo* Linn. Is bitter, astringent, cephalic, stomachic, antiseptic, thermogenic, rejuvenating, ophthalmic, anti-inflammatory useful for bronchitis, asthma and enlargement of spleen. *Dalbergiasissoo* leaf juice for eye ailment, considering the wood and bark as abortifacient, anthelmintic. The wood and bark for anal disorders, blood diseases burning sensation, dysentery, dyspepsia, skin ailments. In the present investigation the attempt has made to study the comparative account of photosynthetic pigment in three medicinal plants. *Samanea Saman* belongs to the Leguminosae family commonly known as rain tree and is native to tropical America. S.saman tree has different parts like a leaf, fruits, pods, seeds, and wood. *S.saman* shows several bioactive compounds which possess various medicinal properties such as antioxidants, antibacterial, anti-diabetic, analgesic, anti-ulcer, insecticidal, antifungal, and cytotoxic activities by (Clarke et al 1993). According to (Ittagi*et al.,* 2014) *Tecoma Stance* used in traditional medicine as a remedy for diabetes mellitus, digestive problems, stomach pain, intestinal worms, and snake bite.

II. MATERIALS AND METHODS

Collection of Plants: Five medicinal plants were selected for this study. These medicinal plants are categorized in two types as Tree and Shrub . These are Tree: *Dalbergiasissoo*, *Samaneasaman,* Shrub: *Canthiumcoromandelicum*, *Vitexnugundo*, and *Tecomastans*. These traditional medicinal plants were collected from Satara (Maharashtra), India. Extraction of Chlorophyll (Arnon, 1949): 100 mg of finely cut fresh leaves were taken and grinded with 15 - 20 ml of 80% acetone. It was then centrifuged at 8000 rpm for 8 min. The supernatant was transferred and the procedure was repeated till the residue becomes colorless. The volume make up has been done up to 50 ml. The absorbance of the solution was taken at 470 nm, 645 nm and 663 nm against the solvent (80% acetone) blank. The process was followed

IJETIR
ISSN (Online) 2583-0554
International Journal of Emerging Technologies and Innovative Research (IJETIR)
Volume 3, Issue 3, March 2023
Impact Factor: 5.731

for all the plant samples. Estimation of Chlorophyll Content: The concentrations of chlorophyll a, chlorophyll b and total chlorophyll were calculated using the following equation (Arnon, 1949):The photosynthetic pigments are estimated the method described by Arnon(1949).The carotenoids were estimated method described by Kirk and Allen (1965).

III. RESULTS AND DISCUSSION

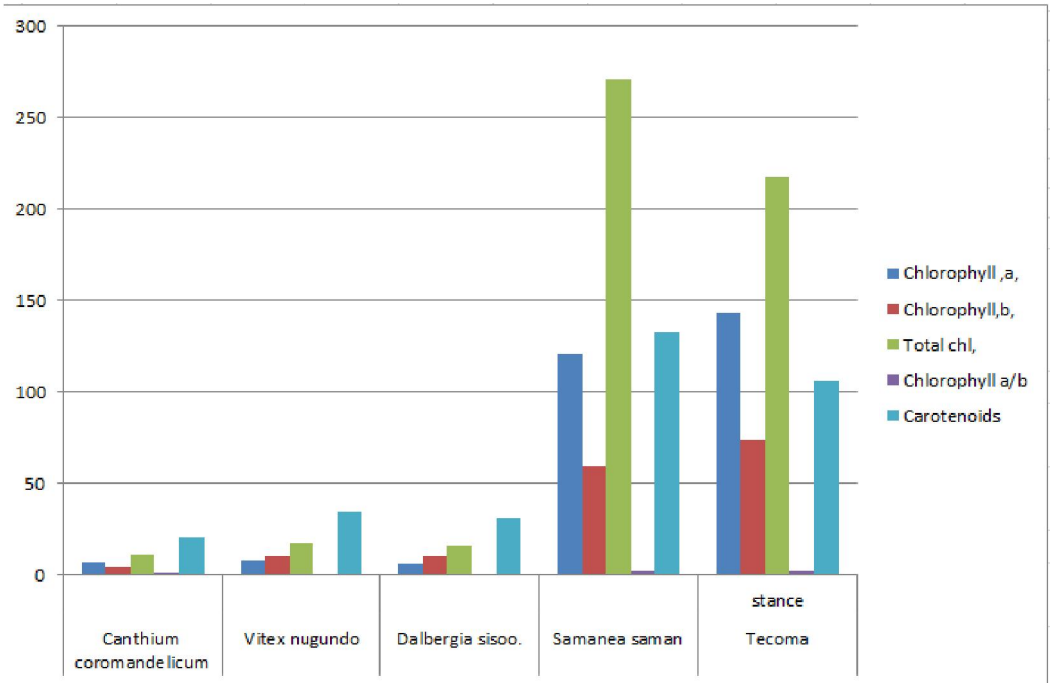
Greens are important sources of protective food which are highly beneficial for the maintenance of good health and prevention of diseases. In this study commonly available plant leaves were used to estimate the chlorophyll content. A total of five plants were selected for this study these include *Canthiumcoromandelicum, Vitexnugundo, Dalbergiasisoo. Samaneasaman* and *Tecoma stance*.

Table 1: Photosynthetic pigment content in the medicinal plants *Canthiumcoromandelicum, Vitexnugudo, Dalbergiasisoo.*

Sr.no	Pigmentes	*Canthiumcoromandelicum*	*Vitexnugundo*	*Dalbergiasisoo.*	*Samaneasaman*	*Tecoma stance*
1	Chlorophyll ,a,	6.584	7.684	5.833	120.89	143.4
2	Chlorophyll,b,	4.15	10.095	10.339	59.7	73.93
3	Total chl,	10.727	17.772	16.165	270.59	217.33
4	Chlorophyll a/b	1.586	0.761	0.564	2.024	2.019
5	Carotenoids	20.64	34.4	30.8	132.59	106.33

Values are expressed in mg/100 gm fresh tissue.

Graph no.1:



Arnon's (1949) equation and the amount of chlorophyll a,chlorophyll b and total chlorophyll were estimated and tabulated. The highest total chlorophyll content (a + b) was detected in *Samaneasaman*, followed by*Tecoma stance*, *Vitexnugudo, Dalbergiasisoo* and *Canthiumcoromandelicum*. showed that amount of leaf chlorophyll a and total chlorophyll a, and carotenoids increased *Tecoma stance. Samaneasaman* and *Vitexnugudo* as compared to *Canthiumcoromandelicum* and *Dalbergiasisoo.* Dougherty *et al.* (1966) termed the leaf pigment of the higher plants

IJETIR
ISSN (Online) 2583-0554
International Journal of Emerging Technologies and Innovative Research (IJETIR)
Volume 3, Issue 3, March 2023
Impact Factor: 5.731

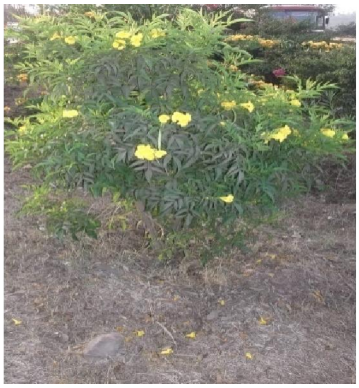
and green algae as Chlorophyll. Chlorophyll serves as an indicator of photosynthetic activity, growth, development, production as well as biochemical aspects of plant species thus providing valuable information about the physiological status of plants (Sims and Gamon, 2002).

The chlorophylls and carotenoids contents in leaves of *Canthiumcoromandelicum* are recorded above in graph. The higher level of carotenoids is noticed in leaves. A noticeable increase in the chlorophyll 'a' than in the chlorophylls 'b' was also observed. Ghosh*et al.,(*2018) reported chlorophyll content in 7 shrub plants. In our results also similar pattern is noticed, in case of chloropylla andchlorophylls 'b'.

According to (Fauziya Basri*et al* 2014),traditionally medicinal use of *Vitexnugundo* have multifarious activities such as analgesic, anti-inflammatory, antioxidant, insecticidal, antimicrobial, anticancer, galactogogue, tonic, febrifuge, expectorant and diuretic properties. Ghosh*et al*(2018)., reported that total carotenoids containing in *Dalbergiasissoo* is 0.295mg/g as compared to similar to that value of our work. Bhavya Doddavarapu*et al*., (2021)estimated 4.548mg/g chlorophyll a and 3.495 mg/g chlorophyll b from *Albiziasaman* leaves. In our results also similar pattern is reported, in case chl a and chl b and ratio of chl a and b.

Canthiumcoromandelicum (N.Burm) Alston.

Dalbergiasisoo Roxb.



Tecoma stance

Samaneasaman

REFERENCES

[1]. Arnon, D. I. (1949). Cupper enzymes isolated chloroplasts: Polyphenol oxidase in Beta vulgaris. *Plant Physiol*., 24: 1-15.

[2]. Bhavya Doddavarapu et al(2021)Comparative studies on chlorophyll concentrationin some important plant families.*Journal of Pharmacognosy and Phytochemistry*; 10(3): 214- 220.

[3]. Dougherty, R.C., Strain, H.H., Svec Walter, A., Uphaus, R.A. and Katz, J.J. (1966). Structure of Chlorophyll c. Journal J. Am. Chem. Soc.88 (21): 5037–5038.

[4]. FauziyaBasri*et al.,* (2014).A Review of ethnomedicinal plant-*Vitexnegundo* Lin .*International Journal of Advanced Research*, Volume 2, Issue 3, 882-894.

[5]. Ghose *et al* (2017)extraction and quantification of pigments from Indian traditional medicinal plants: a comparative study between tree, shrub and herb.*International Journal of Pharmaceutical Sciences and Research*.; Vol. 9(7): 3052-3059.

[6]. Ittagi S., *et al.,*(2014)Cardioprotective effect of hydroalcoholic extract of Tecomastans flowers against isoproterenol induced myocardial infarction in rats. *Asian Pac. J. Trop.* Dis.;4:S378–S384. doi: 10.1016/S2222-1808(14)60474-6.

[7]. Kirk, J. O. T. and Allen, R. L. (1965). Dependence of chloroplast pigment on actidione Arch. *Biochem.Biophys. Res. Commun*. 21: 523-530.

[8]. Sims, D.A. and Gamon, J.A. (2002). Relationships between leaf pigment content and spectral reflectance across a wide range of species, leaf structures and developmental stages. *Remote Sens Environ*, 81: 337-354.