



Study of Methanolic Extract of Leaves *Calotropis gigantea* (L.) As an Anti-Solar



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Abstract

Objective: The present study aimed at the phytochemical examination and anti-solar activity of *Calotropis gigantea* L. (leaf) methanolic extract has more flavonoid content based on this chemical substance photo protective activity was evaluated using UV visible spectrophotometry, where the method is diffused transmittance and the range of UV-visible about 200-400nm.

Methods: The pulverized dried *Calotropis gigantea* L. leaves were extracted with Methanol using soxhlet apparatus. Methanol extract were filtered & evaporated to dryness. The photo protective activity was evaluated by using UV visible spectrophotometry, where the method it is diffused transmittance and the range of UV-visible about 200-400nm for absorption.

Results: The UV scanning absorption spectra of the extract showed very strong absorption at 0.273A with max at 397nm.

Conclusion: The extract has an ability to absorb in the entire UV range.

Keywords: *Calotropis gigantea* L.; Soxhlet apparatus; Methanolic extract; UV radiation; Anti-solar

Introduction

Many of the exposure of skin to sunlight is enjoyable, excessive will effective ones through both heat and ultraviolet radiation (UV) it generates. UV radiation which has a short wavelength than visible light is responsible for harmful effects like blistering sunburn and long term problems like photo-carcinogenesis, photo aging and photosensitivity. To avoid these harmful effects, there are many of the products one it known as sunscreens. Sunscreens are chemicals which absorb sun's ultraviolet (UV) radiation on the skin exposed to sunlight and prevent the UV radiation from reaching in to the skin [1,2]. There are sunscreens which absorb following different types of UV radiation such as UV-A (320-400nm), UV-B (290-320nm), UV-C (100-290nm) and Vacuo UV (10-100nm) [3,4]. The use synthetic sunscreens as photo protective's restricted their use at cellular level and this limited use is because of their potential toxicity in humans and ability to interfere only in selected pathways of the multistage process of carcinogenesis. These rays have a lower energy level and a longer wavelength than UV-C. Their energy is not sufficient to split an ozone molecule; hence some of them extend down to the earth's surface. UV-A (315-400) rays do not have enough energy to break apart the bonds of the ozone, so UV-A rays passes the earth's atmosphere almost unfiltered and causes cancer. The ozone layer depletion decreases our atmospheres natural protection from the sun's harmful ultraviolet radiation. The UV radiation causes skin cancer, premature aging, cataracts

and other eye damage, immune system suppression. As both UV-B and UV-A can be detrimental to our health, it is important that we protect ourselves. This can be done through a variety of ways. The sun protection products including sunscreen creams and lotions are available in the market to absorb or reflect the sun's UV radiation to protect the skin for such damages. The natural substances like anthraquinones, flavonoids and polyphenols have been considered as sunscreen agents because of their ultra violet radiation absorption [5] and antioxidant activities [6] various herbal formulations and chemicals are available to block UV rays and always prevent all types of skin from various types of damages. Our objective is to find out such leaves that are widely used as sunscreen from ancient time. *Calotropis gigantea* L. is a traditional medicinal plant it belongs to the family of Asclepiadaceous [7,8] are widely distribute in Asia and Africa [9-11] Asian countries that includes India, Indonesia, Malaysia, Thailand, Srilanka and China. It is commonly known as milkweed and laticiferous shrub [11]. The plant grows up to 2-4.3 meters long. It has oral, light green leaves and milky stem. The leaves are very much succulent in nature. [12] Plants contain many biologically active molecules with different medicinal properties [13,14]. It is popularly known because it produces large quantity of latex and known as milkweed or swallowwort. Latexes are source of various biologically active compounds, including glycosides, tannins and many proteins,

among others [15,16]. Humankind first utilized materials found in environment an empirical basis to cure various ailments. Natural products from plants and animals traditionally have provided the pharmaceutical industry with one of its important sources of lead compounds in search of new drugs and medicines. The search for new pharmacologically active agents from natural resources such as plants, animals and microbes led to discovery of many clinically useful drugs [17,18].

Materials and Methods

Collection and identification

The plant material *Calotropis gigantea* L were collected from the Satara district, Maharashtra, during the month of July in the year 2016 and authenticated by Dept. of Botany, Y.C.I.S, Satara, Maharashtra, India.

Extraction



Figure 1: Whole plant of *Calotropis gigantea* L.

The pulverized dried *Calotropis gigantea* L leaves were extracted with methanol using soxhlet apparatus Figure 1. Methanol extract were filtered & evaporated to dryness [19-23]

Photochemical examination

The general flavonoid identification tests were performed on the extract.

Test 1: To dry extract, add 5ml of 95% ethanol, few drop of concentrated hydrochloric acid and 0.5g of magnesium turning. The finally pink color observed. (Shinoda test)

Test 2: To a small quantity of extract, add lead acetate solution, it shows yellow colored precipitate is formed.

Preparation of sample

The sample preparations were carried out by 10\mg % w/v concentration dissolving into the 100ml of distilled water (10mg/100ml).

Evaluation of anti-solar activity

The UV absorption spectrum for extract was obtained in range

of 200-400nm using Double beam UV-Visible Spectrophotometer Model Shimadzu-1700.

Result

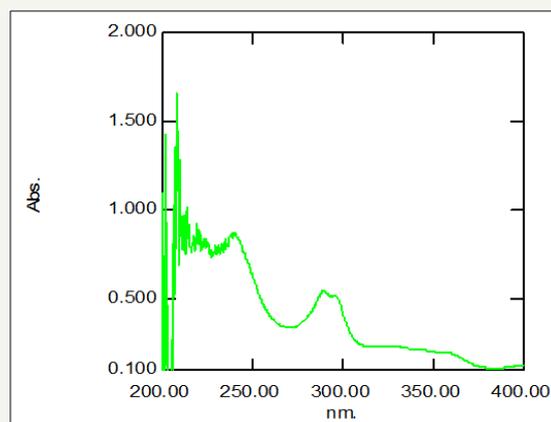


Figure 2: Following figure indicate computerized display reading of absorption spectra of the extract which is directly taken from spectrophotometer.

The UV scanning absorption spectra of the Methanolic extract showed very strong absorption at 0.273A with max at 397nm. The graph Figure 2 extract also showed a plateau in range of 300-400nm with moderate absorbance of ~0.3-0.1.

Discussion

The result obtained were showed the ability of extract to absorb UV radiation and hence proved its UV protection ability. The extract showed a prominent absorbance at 200-240nm, while good absorbance at a range of 240-325nm. The moderate absorbance was noted at the range of 320-400nm. Qualitative investigation indicated the presence of flavonoids in the extract. Flavonoids are the coloured pigments mainly found in leaves and flowers amongst the natural sources. They are well known for their attractive colors and pharmacological activities. It also absorbs light and helps to protect the photosensitive substances in the flower and leaves and thus play a key role in the defense mechanism of plants. Absorption of UV radiation is a main characteristic for identification of flavonoids in natural sources. The results showed strong-to-moderate absorption of UV radiation along the whole range and this ability may be due to the presence of flavonoids.

Conclusion

The extract has an ability to absorb in the entire UV range. This property to absorb in the entire UV range can be utilized for the methanolic extract to be considered as a proper wide spectrum sunscreen and also in anti-ageing cream preparation, which would be a better, cheaper and safe alternative to harmful chemical sunscreens used in modern day industry.

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