

STUDY OF METHANOLIC EXTRACT OF LEAVES OF *TRIDAX PROCUMBENS* AS AN ANTI-SOLAR

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ABSTRACT

Objective: The present study aimed at the phytochemical examination and anti-solar activity of *Tridax procumbens* Linn. (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 *Tridax procumbens* leaves were extracted with ethanol using soxhlet apparatus. Ethanol 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 0.273 A with max at 397 nm. **Conclusion:** The extract has an ability to absorb in the entire UV range.

KEYWORDS: *Tridax procumbens*, Soxhlet apparatus, UV radiation, Anti-solar.**INTRODUCTION**

While some exposure of skin to sunlight is enjoyable, excessive will affect ones through both heat and ultraviolet radiation (UV) it generates. UV radiation which has a shorter wavelength than visible light is responsible for harmful effects like blistering sunburn and long term problems like photocarcinogenesis, photoaging and photosensitivity. To avoid these harmful effects, there are products 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 the skin.^[1] There are sunscreens which absorb different types of UV radiation such as UV-A (320-400 nm), UV-B (290- 320 nm), UV-C (100-290 nm) and Vacuo UV (10-100 nm).^[2] The use of many synthetic sunscreens as photoprotectives 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^[3] and antioxidant activities^[4] 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. *Tridax procumbens* Linn. commonly known as 'Ghamra' and in English popularly called 'coat buttons' because of appearance of flowers which has been extensively used in Ayurvedic system of medicine for various ailments and is dispensed for "Bhringraj" by some of the practitioners of Ayurveda which is well known medicine for liver disorders.^[5] The plant is native of tropical America and naturalized in tropical Africa, Asia, Australia and India. It is a wild herb distributed throughout India. Coat buttons are found along roadsides, waste grounds, dikes, railroads, riverbanks, meadows, and dunes. Its widespread distribution and importance as a weed are due to its spreading stems and abundant seed production.^[6] *Tridax* is a weak straggling herb about 12- 24cm long with few leaves 6-8cm long and very long slender solitary peduncles a foot or more in length. Leaf is simple, opposite, exstipulate, ovate, acute with two types of

flowers such as ray- florets and disk-florets.^[7] The leaf and flower of *Tridax procumbens* possesses antiseptic, insecticidal and antiparasitic properties. It is also known to prevent hair fall and check hemorrhage from cuts and bruises. They also possess various pharmacological activities like immunomodulatory, antidiabetic, anti-hepatotoxic and anti-oxidant, Anti-inflammatory and Analgesic activity.^[8] The most important of the bioactive constituents of plants are alkaloids, tannins, flavonoids, and phenolic compounds.^[9] A new flavonoid (procumbetin), isolated from the aerial parts of *Tridax procumbens*, has been characterised as 3,6-dimethoxy-

5,7,2',3',4'- pentahydroxyflavone 7-O-β-D-glucopyranoside on the basis of spectroscopic techniques and by chemical means. *Tridax procumbens*; Flavonoids Plant, commonly used in Indian traditional medicine as anticoagulant, hair tonic, antifungal and insect repellent, in bronchial catarrh, diarrhoea, dysentery, and wound healing. Previously isolated constituents Alkyl esters, sterols, pentacyclic triterpenes, fatty acids and polysaccharides. New isolated constituent 3, 6-Dimethoxy-5, 7, 2', 3', 4'-pentahydroxyflavone 7- O-β-D-glucopyranoside, named procumbetin Z yield: 0.016% on dried basis.^[10]



Fig. 1: Whole Plant of *Tridax procumbens*.

MATERIALS AND METHODS

Collection and Identification

The plant material *Tridax procumbens* Linn (Compositae) were collected from the Satara district, Maharashtra, during the month of July in the year 2014 and authenticated by Dept. of Botany, Y.C.I.S, Satara, Maharashtra, India.

Extraction

The pulverized dried *Tridax procumbens* leaves were extracted with methanol using soxhlet apparatus. methanol extract were filtered & evaporated to dryness.^[11,12]

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 0.5 g of magnesium turning. The finally pink color observed. (Shinoda test).

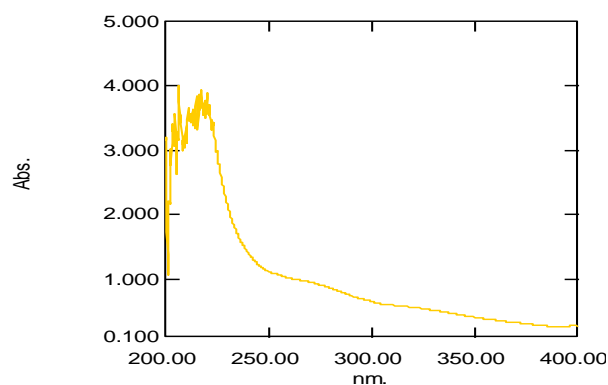
Test 2: To a small quantity of extract, add lead acetate solution, it shows yellow colored precipitate is formed.

Preparation of sample

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

Evaluation of anti-solar activity

The UV absorption spectrum for extract was obtained in range of 200-400 nm using Double beam UV-Vis Spectrophotometer Model Shimadzu-1700.



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

RESULT

The UV scanning absorption spectra of the extract showed very strong absorption at 0.273 A with __max at 397 nm. The graph extract also showed a plateau in range of 300-400 nm 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 200–240 nm, while good absorbance at a range of 240–325 nm. The moderate absorbance was noted at the range of 320–400 nm.

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 colours 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 defence 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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