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Study of Methanolic Leaves Extract of *Curcuma longa* as an Anti-solar

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ABSTRACT

The present study aimed at the phytochemical examination and anti-solar activity of *Curcuma longa* (leaf) methonolic 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 200-400 nm. The pulverized dried *Curcuma longa* 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 200-400 nm for absorption. The UV scanning absorption spectra of the extract showed very strong absorption 0.273 at 397 nm. The extract has an ability to absorb in the entire UV range.

Key words: *Curcuma longa*, Soxhlet apparatus, Methanolic Extract, UV radiation, Anti-solar.

1. INTRODUCTION

Many of the pharmaceutical formulations explore of external skin to sunlight is useful, excessive will effective ones through both heat of sunlight and ultraviolet radiation (UV) it generates. UV radiation which has a short wavelength than visible light is responsible for many of the harmful effects like blistering sunburn and long term problems like photocarcinogenesis, photoaging and photosensitivity. To avoid these harmful effects, there are many of the products available in market one it known as sunscreens. Sunscreens are chemical formulations 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 (320-400 nm), UV-B (290- 320 nm), UV-C (100-290 nm) and Vacuo UV (10-100 nm). [3, 4] Usage of 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[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.

The different parts of *curcuma longa* Linn Plant (Family-Zingiberaceae) are known for their various medicinal properties. [7-12] The active constituents of turmeric are the flavonoids curcumin (diferuloylmethane) and various volatile oils, including tumerone, atlantone, and zingiberone. Other constituents include sugars, proteins, and resins. The best-researched active constituent is curcumin, which comprises 0.3–5.4 percent of raw turmeric.[13] It contains a mixture of powerful antioxidant phytonutrients known as curcuminoids and inhibits cancer at initiation, promotion and progression stages of tumor development. It is a strong anti-oxidant, which supports colon health, exerts neuroprotective activity and helps to maintain a healthy cardiovascular system.[14]

1.1 Scientific classification [15]

Kingdom : Plantae
Subkingdom : Tracheobionta
Superdivision : Spermatophyta
Division : Magnoliophyta
Subclass : Zingiberidae
Order : Zingiberales
Family : Zingiberaceae
Genus : Curcuma
Species : Longa
Scientific name: *Curcuma longa*

2. MATERIALS AND METHODS

2.1 Collection and Identification

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

2.2 Extraction

The pulverized dried *Curcuma longa* leaves were extracted with methanol using soxhlet apparatus. Methanol extract were filtered & evaporated to dryness. [16, 17, 18]

2.3 Photochemical Examination

The general flavonoid identification tests were performed on the extract.

2.3.1 Test 1

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

2.3.2 Test 2

To a small quantity of extract, added lead acetate solution and yellow colored precipitate is formed.

2.4 Preparation of sample

The sample preparations were carried out by 0.1 mg % w/v concentration dissolving into the 100 ml of distilled water (10 mg/100ml).

2.5 Evaluation of Anti-solar activity

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

3. RESULT AND DISCUSSION

The UV scanning absorption spectra of the Methanolic extract showed very strong absorption at 0.278. A with max at 248 nm. The graph extract also showed a plateau in range of 300-400 nm with moderate absorbance of ~0.3-0.1.

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 200–250 nm, while good absorbance at a range of 240–325 nm. The moderate absorbance was noted at the range of 200–400 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 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.

Fig. 1. Whole Plant of *Curcuma longa*

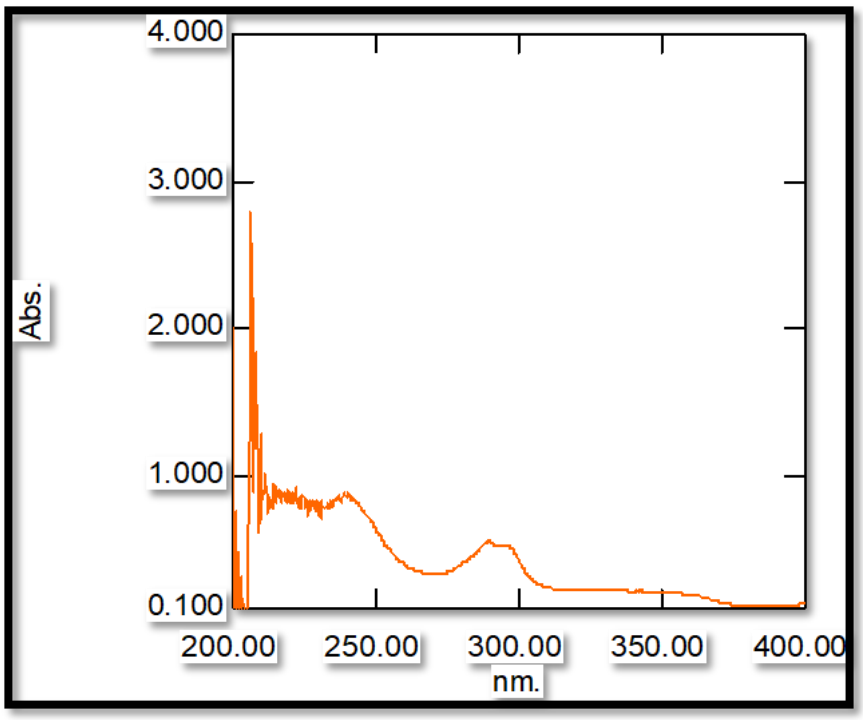

Fig. 2. Computerized display reading of absorption spectra of the extract taken from spectrophotometer

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.

4. CONCLUSION

The methanolic 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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