



RESEARCH ARTICLE

STUDY ON IN-VITRO EVALUATION OF FRUIT OF *TERMINALIA CATAPPA* LINN AS A NATURAL ANTI-SOLAR AGENT

Nevade Sidram, A., Sachin G. Lokapure and N. V. Kalyane

Department of Pharmaceutical chemistry. B. L. D. E. A college of Pharmacy, Bijapur

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ABSTRACT

The aim of this work was to evaluate UV absorption ability of *terminalia catappa* Linn in view of a possible application as anti-solar agent. The ethanol extract was prepared by 90% ethanol with maceration process and method was performed by UV visible spectrophotometry in range of 200- 400 nm for this plants. Sunlight stimulates hormone protection, and it allows synthesis of vitamins D promotes skin cell regeneration and contributes to all overseen of well being of individual. The sunlight which also stimulates melanin and the pigment that acts as the skin natural sunscreen. But excessive radiations of sunrays are unprotected and leading to painful sunburn or other skin related complication. The finalize result of extract was reported as maximum absorbance at 200nm while good absorbance at 240nm to 300nm. The moderate absorbance at 300-360nm.

Key words: UV protective, *terminalia catappa* Linn, anti-solar.

INTRODUCTION

Every year, more than one million people are diagnosed with skin cancer and about 10,000 die from malignant melanoma. Most skin cancers occur on the areas that are most frequently exposed to the sun, such as the face, neck, and the back of the hands (Mehta P *et al.*, 2006). Sunlight stimulates hormone protection, and it allows synthesis of vitamins D promotes skin cell regeneration and contributes to all overseen of well-being of individual. The sunlight which also stimulates melanin and the pigment that acts as the skin natural sunscreen. But excessive radiations of sunrays are unprotected and leading to painful sunburn or other skin related complication. Skin, an architecturally marvelous structure has a surface area of 1.5 to 2 m². It is pliable yet tough, allowing it to take constant punishment from the external environment. Sunlight is one such factor that affects the skin constantly and in the process causing damage. Skin has the intrinsic properties to protect itself from the sun, in form of melanin. (Mitsui T. 1998). Skin, an architecturally marvelous structure has a surface area of 1.5 to 2 m². It is pliable yet tough, allowing it to take constant punishment from the external environment. Sunlight is one such factor that affects the skin constantly and in the process causing damage. Skin has the intrinsic properties to protect itself from the sun, in form of melanin. (Lu H *et al.*, 1996). Exposed sun UV light is classified into three types, by its wavelengths as UV-A, UV-B and UV-C. The dimensions of their wavelength are roughly 400-320nm for UV-A, 320-290nm for UV-B and 209-200nm for UV-C. Although it may be observed that the shorter wavelength and the lower the number, the greater the

Energy level of the light and the more damage it can do (Saraf S *et al.*, 2005). Direct exposure to UV-C for a length of time would destroy the skin. Fortunately, UV-C is completely absorbed by gases in the atmospheres before it reaches the ground. In any time the longer wavelength of UV-B and UV-A pass right through the atmosphere. The molecules in sunscreen absorb most of UV-Band prevent it from reaching the skin just as the molecules of the atmospheres absorbs UV-C and prevent it from reaching the ground (Saraf S *et al.*, 2005). Various herbal formulation and chemicals are available to block various ranges of UV rays and always prevent all types of skin from various damages. Our study is to find out such flowers that are widely used as sunscreen from ancient time. *Terminalia catappa* Linn belongs to the family combretaceae. It is commonly called tropical almond, wild almond, Indian almond, Malabar almond, Singapore almond, sea almond, West Indian almond. Tropical almond is a large deciduous stately tree, originally from India. The plant is a large tree, which can reach up to 30 m height with a thick broad trunk; the leaves cluster toward the end of the branches with glossy, obovate blades mostly 8-30 cm in length and turn red before turning brown and falling (Whistler A, 1992). The tree has a characteristic pagoda shape. It has large (2-3 inches) nutty fruit that test very much like commercially grown almonds. The colour of the oval fruit is green, yellow, or reddish. Chemical constitute of fruit are beta carotene, cyaniding-3-glucoside, brevifolin carboxylic acid, glucose, corilagin, ellagic acid, gallic acid, pentosans and tannins (Manjunath B.L., 1976 and Soepadmo E., 1998). In the traditional medicine, its leaves, bark and fruits are used in dysentery, for dressing of rheumatic joints, to treat cough, asthma. Fruits are said to be helpful in the treatment of leprosy, headaches, in reducing travel nausea.

*Corresponding author: sidhnevade18@gmail.com

Leaves help to get rid of intestinal parasites; treat eye problem, rheumatism and wound, stop bleeding during teeth extraction. Fallon leaves are used to treat liver disease, while young leaves are used for colic (Soepadmo E., 1998, Kirtikar K.R *et al.*, 1991 and Corner E.J.H., 1997). Also *Terminalia catappa* is a medium sized tree whose branches form layers of canopy. The various extracts of the leaves and bark of this tree have been reported to have different medicinal values, including antidiabetic, antioxidant and hepatoprotective (Lin *et al.*, 1997; Chen *et al.*, 2000; Nagappa *et al.*, 2003).

MATERIALS AND METHOD

The fresh fruit and flowering twigs were collected and authenticated in Dept. of botany. The fruit were cleaned with water and the pericarp and mesocarp were separated from whole fruit and dried by circulating cool air. The pericarps are discarded and mesocarps that were used for further study were cut into small pieces of about 1 cm². 100 g powered mesocarps were extracted with 150ml of 90% ethanol by maceration. The extracts were evaporated to dryness on steam bath. The general flavonoid identification test was performed on the extract (Khandelwal KR., 2004).

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 colour observed. (Shinoda test)

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

Experimental Work

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). The UV absorption spectrum for the extract was obtained in ranges of 200-400 nm using double beam UV-Vis Spectrophotometer model Shimadzu-1700. The figure 1 indicates scanning absorption spectra of the extract in given range and figure 2 indicate digital monitor display reading of absorption spectra of the extract which is directly taken from spectrophotometer.

RESULTS

The UV scanning absorption spectra of the extract showed very strong absorption (0.43) with λ_{max} at 200nm and λ_{max} at 260nm with absorbance of ~0.1. The graph if extract also showed a plateau in range of 289-400 nm with moderate absorbance of ~0.2-0.1.

Figure 1: scanning indicates absorption spectra of the extract

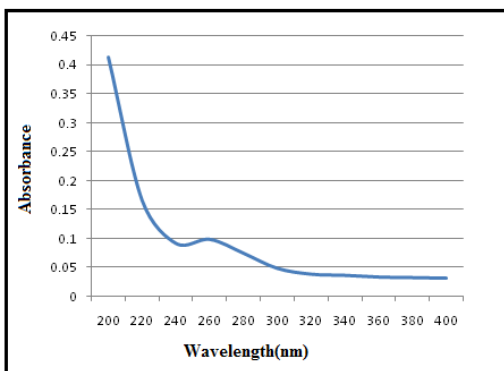
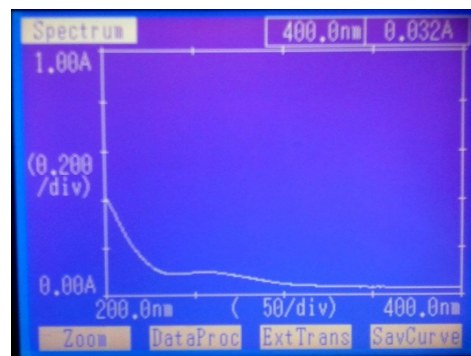


Figure 2: Digital monitor display reading of absorption spectra of the extract



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 200-250nm, while good absorbance at range of 240-300nm and moderate absorbance was reported at range of 300-360nm. Qualitatively investigation indicates that presence of flavonoid in the extract. This flavonoids are coloured compound pigment found in various leaves and flower amongst the natural source. They are well known for their attractive colours and pharmacological activities, it absorbs light and helps to protect as photosensitive substances in the flower and leaves. Thus it play key role in defense mechanisms in plant. The absorption of UV radiation is a main characteristic for identification of flavonoids in natural source. Due to presence of these flavonoids the result showed strong to moderate absorbance of UV radiation along the whole ranges. The present study is essential for collection of similar data for different plant and there flowers, as well as other parts. This proved activity of plant showed its importance and prophylactic utility in anti- solar formulation. This will be a better, cheaper and safe alternative to harmful chemical sunscreens that used now a day in the industry.

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