ORIGINAL ARTICLE

Study of methanolic extract of flower of *Spathodea campanulata* L. as an anti-solar

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Sunlight stimulates hormone production, allows for the synthesis of vitamin D, promotes skin cell regeneration and contributes to all overall sense of well-being of individual. Also sunlight stimulates the melanin, the pigment that acts as the skin natural sunscreen. But excessive unprotected exposure to sunrays can lead to painful sunburn or other skin-related complications. This paper evaluates the UV absorption ability of flowers from *Spathodea campanulata* L. (Bignoniaceae) as an anti-solar agent. The extract was prepared by maceration with a mixture of distilled water and methanol (2:5). The method is performed by UV–visible spectrophotometry in the range of 200–400 nm and result of the extract showed maximum absorbance at 200–240 nm, while good absorbance at 240–325 nm. The moderate absorbance was noted at 310–340 nm.

Key words: UV protective, *Spathodea campanulata*, anti-solar

INTRODUCTION

Skin, an architecturally marvellous structure has a surface area of 1.5–2 m^2. 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.[1]

Exposed sun ultraviolet light is classified into three types, by its wavelengths: UVA, UVB and UVC. The dimensions of their wavelengths are roughly 400–320 nm for UVA, 320–290 nm for UVB and 290–200 nm for UVC. Although it may be observed that the shorter the wavelength and the lower the number, the greater the energy level of the light and the more damage it can do.[2]

Direct exposure to UVC for a length of time would destroy the skin. Fortunately, UVC is completely absorbed by gases in the atmosphere before it reaches the ground.[2] In any time the longer wavelength of UVB and UVA pass right through the atmosphere. The molecules in sunscreen absorb most UVB and prevent it from reaching the skin just as the molecules of the atmosphere absorb UVC and prevent it from reaching the ground.

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 flowers that are widely used as sunscreen from ancient time.

Spathodea campanulata L. is native of tropical Africa, with orange scarlet bell shaped flowers, three by two and half inch large, that appear in November, the climate of Mumbai seems to suit it and may be seen in full flowering in the month of November.[3] Plant is known as the tree, tulip tree, -of-the-forest or Flame.[4] It is generally planted as an ornamental plant along the roadside. Hence, the flowers are easily available and abundant. The flower part is most colourful and consists of maximum amount of chromophores responsible for the activity. The plant stem bark was previously reported to have anti-hyperglycaemic,[5] anti-malarial,[6] as well as wound healing and antioxidant activities.[7]

MATERIALS AND METHODS

S. campanulata L. flowers were freshly obtained from nursery at Sangli; botanical identification was performed at the Department of Botany in Willingdon College Sangli. Later the petals were separated and dried by circulating cool air. A 100 g powdered petals were extracted with distilled water:methanol (2:5) by maceration. The extracts were evaporated to dryness on steam bath. The general flavonoid identification test was performed on the extract.[8]

Test 1 (Shinoda test): To dry extract, add 5 ml 95% ethanol, few drops of concentrated hydrochloric acid and 0.5 g

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magnesium turnings. Pink colour observed.

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

Preparation of sample: samples were prepared in 8 mg% w/v concentration by using distilled water (8 mg/100 ml).

The UV absorption spectrum for the extract was obtained in the range of 200–400 nm using Jasco double beam UV–visible spectrophotometer. Figure 1 indicates absorption spectra of the extract in the given range.

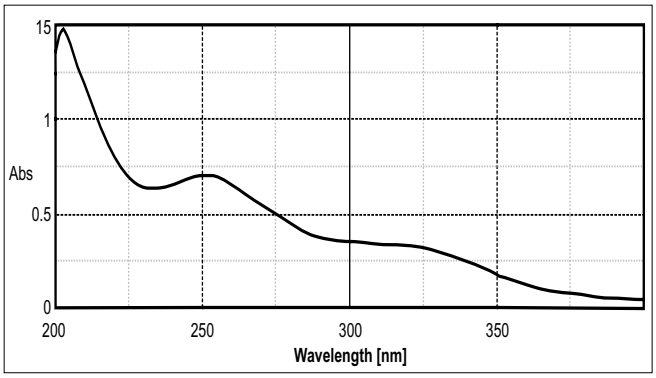

Figure 1: Scanning spectra of extract on UV spectrophotometer

RESULT

UV scanning of the extract showed very strong absorbance (1.5) with λ_{max} at 205 nm and λ_{max} at 252 nm with absorbance of ~0.7. This extract also showed a plateau in the range of 280–330 nm with moderate absorbance of ~0.4–0.3.

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 310–340 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.

CONCLUSIONS

The present study point outs the essentiality of collecting similar data for different plants and there flowers, as well as other parts. The proved activity of the plant shows its importance and prophylactic utility in anti-solar formulations. 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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