

IN VITRO ANTIOXIDANT AND UV PROTECTIVE ACTIVITY OF YELLOW FLOWERS OF *TECOMA STANS* L Juss.

Rutuja Sabne^{1*}, Vijay Sawant¹, Sandeep B.Patil² and Nilofar S. Naikwade³

¹Smt. Kasturba Walchand College, Sangli, INDIA

²Adarsh College of Pharmacy, Vita, Sangli, Maharashtra, INDIA

³Appasaheb Birnale College of Pharmacy, Sangli, Maharashtra, INDIA

Corresponding Author: sandeeppharmacology@gmail.com

Received 04-01-18; Revised & Accepted: 15-02-18

ABSTRACT

The present study was designed to study Antioxidant and UV protective activity of *Tecoma stans* (L.) Juss. (Bignoniaceae) is one of the well-known ornamental plant for its therapeutic values in traditional medicine.

Hydroalcoholic extract of flowers containing flavonoid showed sunscreen activity. The sunscreen activities of extract could be related to the free radical scavenging properties of polyphenol compounds in the extracts incorporated in it. The method is performed by UV –visible spectrophotometry in the range of 200-400nm. Result of the extracts showed maximum absorbance at 211nm.

KEYWORDS: *Tecoma stans* (L.) Juss, Antioxidant, UV protective activity

INTRODUCTION

Tecoma stans (L.) Juss. (Yellow bells plants) of the Bignoniaceae family, is an important medicinal plant. It is ornamental shrub with 2 to 4 meters high. It is an important medicinal herb found as a weed throughout India. All parts like seeds, roots and bark are used medicinally. This plant has more medicinal compound constituents are phytosterols, alkaloids, quinines, amino acid, monoterpenes, triterpene, glycosides, phenols, tannins, saponins, and flavonoids. Also used to cure anti-diabetic, diuretic, anti-spasmodic, antimicrobial, anti-fungal and anticancer.

Sunscreens are chemicals that provide protection against the adverse effects of solar and in particular UV radiation¹. Exposed sun ultraviolet light classifies into 3 types, by its wavelengths: UVA, UVB and UVC. Direct exposure to UVC for a length of time would destroy the skin. Various herbal formulations and chemicals are available to block UV rays and always prevent all types of skin from various types of damages^{2,3}.

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 (Patil *et al.*, 2009).

The extract was prepared by different processes like aqueous, decoction, microwave oven and methanolic maceration and activity was performed antioxidant (DPPH) and Hydroalcoholic extract used for UV protective activity by using UV Visible spectroscopy.

MATERIALS AND METHODS

Tecoma stans (L.) Juss flowers were freshly obtained from local region at Sangli; botanical identification was performed at the Department of Botany in Smt. Kasturba Walchand College, Sangli. Later the petals were separated and dried by circulating cool air. 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.⁴

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

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

DPPH radical scavenging activity

The ability of Compunds to scavenge DPPH radical was assessed using Ramanathan Sambath Kumar et al and Manzocco et al., 1998 method with modification. Briefly, 1 ml of Different forms of extracts of *Tecoma stans* (L.) Juss flower sat concentration of 500, 50, 10µg/ml was mixed with 3.0 mL DPPH (0.5 mmol/L in methanol), the resultant absorbance was recorded at 517 nm after 30 min. incubation at 37°C. The percentage of scavenging activity was derived using the following formula,

$$\text{Percentage of inhibition (\%)} = [(A \text{ control} - A \text{ sample}) / A \text{ control}] \times 100$$

Where A control - absorbance of DPPH

A sample - absorbance reaction mixture (DPPH with Sample).

RESULTS AND DISCUSSION

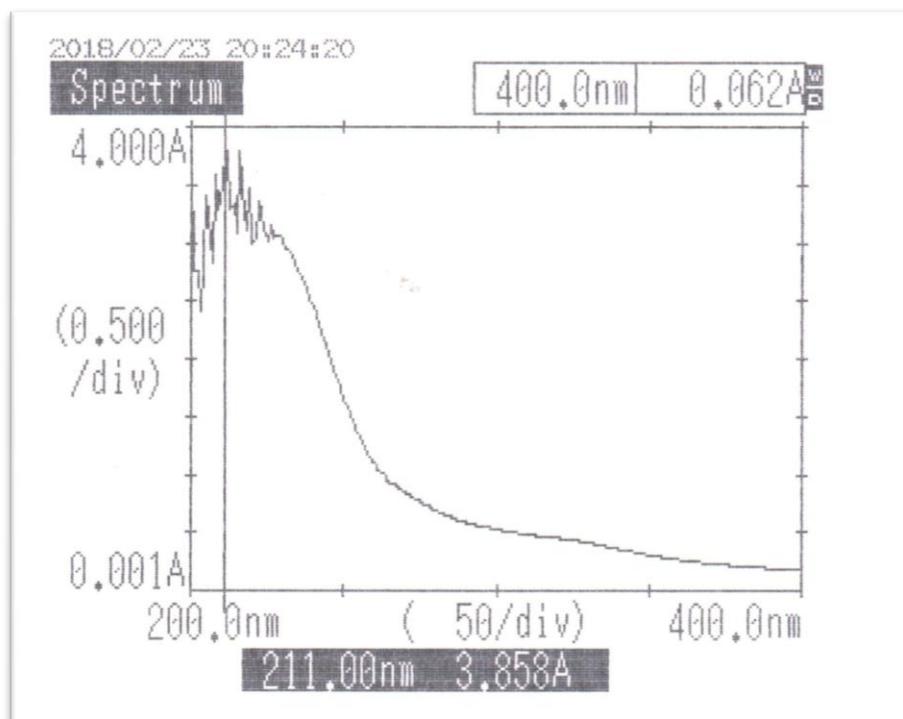


Fig. 1: Scanning spectra of extract on UV spectrophotometer of yellow flowers

The results obtained were showed the flower extract and its formulation has ability to absorb UV radiation, hence it's proved UV protection. All three extract can absorb UV radiation in the range of

200-400nm. However, the ranges giving maximum absorption for *Tecoma stans* (L.) Juss were 210-300. Although the maximum absorption of these extracts are in the range of UVB. The UV absorption of these extracts is suggested to be because of the presence of the flavonoid components within the extract.

Table 1: In vitro UV Protective activity

Extract	Wavelength(nm)	Absorbance(max)
Hydroalcoholic extract of flower	211.00 nm	0.062

The result obtained were showed the ability of berries extract to absorb UV radiation and hence proved its UV protection ability. The extract showed a prominent absorbance at 200-230nm. The absorption of UV radiation is the main characteristic for identification of flavonoids in natural sources. These results showed more prominent absorption due to presence of flavonoids.

Table 2: In vitro anti-oxidant activity of DPPH activity

Extracts/ concentration	% inhibition		
	500 µg/ml	50 µg/ml	10 µg/ml
Control	--	--	--
Aqueous extract	26.82	13.41	25.60
Decoction extract	62.19	17.87	25.60
Micro oven extract	53.65	23.17	23.17
Methanol extract	68.29	26.82	23.17
Ascorbic acid	66.99	56.28	49.36

CONCLUSION

Based on our results, it can be concluded that the percentage inhibition antioxidant activity of *Tecoma stans* (L.) Juss was found. The proved activity of yellow flower extracts shows its importance and prophylactic utility in antisolar formulations. This will be a better, cheaper and safe alternative to harmful chemical sunscreens that used now a day in the industry.

REFERENCES

1. Elmets CA and Young C. Sunscreens and photocarcinogenesis: An objective assessment *Photochem. Photobiol.* (1996) 63: 435-439
2. Vinayak V. Patil, S.B. Patil, M.S. Kondawar, N.S. Naikwade and C.S. Magdum Study of Methanolic Extract of Flower of *Spathodeacampanulata* L. as an Anti-Solar. *International Journal of Green Pharmacy* Vol. 3, Issue-3, July-Sept 2009, Pg. No. 248-249.
3. Saraf S, Saraf SS, Ashawat M. Anti solar activity of flowers extracts of *R. damascena* and *T. erecta* Linn. *Plantaindica*. 2005; 1(3): 26-7.
4. Khandelwal KR. *Practical Pharmacognosy*. 12th ed. Nirali Prakashan: Pune; 2004.