



## Research Article

### STUDY OF AQUEOUS EXTRACT OF BLACK TEA AS AN ANTI-SOLAR

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#### ABSTRACT

Natural substances like flavonoids and other polyphenols have been considered as an excellent sunscreen agents because of their ability to absorb the UV radiation. The present study aimed at the phytochemical examination and anti-solar activity of black tea. The aqueous extract was prepared and method was performed by UV- visible spectrophotometry in range of 200 -400nm. The results suggested that aqueous extract of black tea exhibited better anti-solar activity. Therefore it was concluded that black tea can be used in various sunscreen formulations.

**Key words:** Anti-Solar, Black Tea, UV Radiation.

#### INTRODUCTION

Sunlight is a portion of electromagnetic radiation given off by the sun. The sun emits ultraviolet rays, x-rays, visible light, infrared rays and radio waves. The electromagnetic radiation differs in their energy content. Ultraviolet (UV) radiation is more energetic than visible radiation and therefore has a shorter wavelength<sup>[1]</sup>. Sunscreens are chemical which absorbs sun's ultraviolet (UV) radiation on the skin exposed to sunlight and prevent the UV radiation from reaching the skin there are sunscreens which absorbs different types of UV radiation such as UV-A (320-400nm), UV-B (290-320nm), UV-C (100-290nm) and vacuo UV (10-100nm). 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.<sup>[2, 5, 6]</sup>

UV radiation appears to diminish the effectiveness of the immune system by changing the activity and distribution of cells responsible for triggering immune responses. Harmful effects of UV radiation can vary from damage to immune system suppression and ultimately cancer, even for the young<sup>[3, 8]</sup>. The natural substances like anthraquinones, flavonoids and polyphenols have been considered as sunscreen agents because of their ultra violet radiation absorption and antioxidant activities.<sup>[1,9]</sup>

Tea is the second most commonly drunk liquid after water and the most common beverage drunk. Tea the drink is an infusion of varieties of evergreen shrub botanically called *Camellia sinensis*. Black tea is one of a varieties of preparations made from *Camellia sinensis*. Other includes green teas, white tea. The chemical compositions of *Camellia sinensis* is not completely known but is understood to be quite complex. Black tea is more complex than green tea partly because of the oxidation process that occurs during fermentation. *Camellia sinensis* has been used for different purpose which could be classified as edible use, medicinal use and other uses which

include dye, essential oil, food flavoring and perfumery<sup>[4]</sup>It acts as an anti-oxidant, also as hypocholesterolemic action.<sup>[7]</sup>



Figure 1: black tea powder

#### MATERIAL AND METHOD

##### Extraction of black tea

Aqueous extraction was done as follows sterile distilled water was allowed to boil, 100ml of the water was measured into a conical flask with 5 gm. of black tea and allowed to extract for about two minutes<sup>[4]</sup>.

##### Phytochemical screening and anti-solar activity

The preliminary test such as Shinoda test, lead acetate and sodium hydroxide were performed to confirm the presence of flavonoids.

**Shinoda test:** to the aqueous extracts 5ml of 95% ethanol and few drops of concentrated HCL and 0.5 g of magnesium turnings were added. The development of pink colour indicated the presence of flavonoids.

**Lead acetate test:** to the aqueous extracts lead acetate solution was added and the formation of yellow precipitate indicated the presence of flavonoids

**Sodium hydroxide test:** to the aqueous extracts an increasing amount of sodium hydroxide was added and the formation of yellow colour which decolorized after the addition acid confirmed the presence of flavonoids.

### Evaluation of anti-solar activity

Sample was prepared in 1ml aqueous extract in 10 ml of distilled water.

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

### RESULTS

The UV scanning absorption spectra of the extract showed very strong absorption at 0.289 A with  $\lambda_{max}$  at 328 -nm. The graph extract also showed a plateau in range of 300-400 nm with moderate absorbance of ~0.3-0.1.

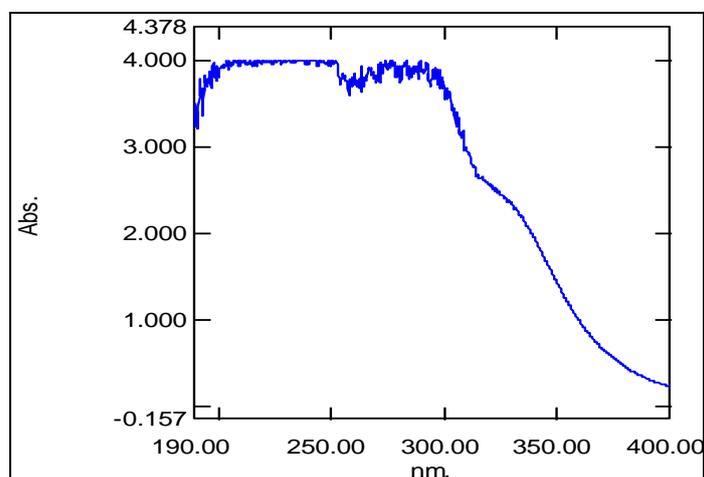


Figure 2: Indicate computerized display reading of absorption spectra of the extract which is directly taken from spectrophotometer

### DISCUSSION

Qualitative investigation showed the presence of flavonoids in the extract. Flavonoids are well known for their pharmacological activities. It absorbs are well known for their pharmacological activities. It absorbs light and helps to protect the photosensitive substances in black tea. Absorption of UV radiation is the results showed strong to moderate absorption of UV radiation and this ability is due to the presence of UV radiation and this ability is due to the presence of flavonoids.

### CONCLUSION

The aqueous extract of black tea has ability to absorb UV radiation. The proved anti-solar activity of the black tea shows its importance and prophylactic utility in anti-solar formulation. This will be a better, cheaper and safe alternative to harmful chemical sunscreen that used nowadays in the industry.

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