Mintage Journal of Pharmaceutical & Medical Sciences

Vol 7, Issue 2, 2018 ISSN: 2320-3315

Research Article

# ANTISOLAR AND ANTIOXIDANT ACTIVITY OF FRESH BERRIES OF *CESTRUM NOCTURNUM*

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Received - 31.01.2018; Reviewed and accepted - 06.03.2018

**ABSTRACT**

**Aim:** This paper evaluates the UV absorption ability of berries from *Cestrum nocturnum* (Solanaceae) as an anti-solar agent and antioxidant activity. **Material and Methods:** premature and mature berries with different concentration 200 to 1000µg/ml in order to check antioxidant activity by Nitric oxide radical scavenging activity, H2O2 and antisolar activity of both berries by UV visible spectroscopy. **Results:** nitric oxide scavenging activity of mature berries extract and ascorbic acid showed 31.14 % and 35.15% and H2O2 scavenging activity showed 57.50% and 39.18% respectively result of the extract showed maximum absorbance of immature berries was 223nm and mature berries was 222nm. **Conclusion:** The different concentrations of *Cestrum nocturnum* had an effective antioxidant and UV protective activity. It can be used to protect UV induced skin problems.

**Keywords:** Antisolar, Antioxidant, Nitric oxide radical scavenging activity, H2O2,

## INTRODUCTION

Antioxidants are substances that may protect cells from the injure caused by unstable molecules known as free radicals. Antioxidants interact with and stabilize free radicals and may prevent some of the damage free radicals might otherwise cause. Free radical damage may lead to cancer. Examples of antioxidants include beta-carotene, lycopene, vitamins C, E, A and other substances [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].

*Cestrum nocturnum* (common names include night-blooming jasmine, night-blooming cestrum, lady of the night, queen of the night, night-blooming jessamine, and Hāsnühānā) is a species of Cestrum in the plant family Solanaceae (the potato family) [3]. This plant was previously used against larvicidal activity [4].

## MATERIAL AND METHOD

*Cestrum nocturnum* berries were collected from Maharashtra, India in February 2016. The plant was identified by Wadmare Sir, Department of Botany, KWC College Later 100 mg of berries was taken and dissolved in distilled water and then the solution was filtered. Filtrate was collected and was used as extract.

## METHOD

### Nitric oxide radical scavenging activity

Nitric Oxide is generated in biological tissues by specific nitric oxide synthesis, which metabolizes arginine to citrulline with the formation of NO·via a five electron oxidative reaction [5]. The compound sodium nitroprusside is known to decompose in aqueous solution at physiological pH (7.2) producing NO· Under aerobic conditions, NO· reacts with oxygen to produce stable products (nitrate and nitrite), the quantities of which can be determined using Griess reagent [6] [7].

One ml of 10 MM sodium nitroprusside dissolved in 0.5 ml phosphate buffer saline (pH 7.4) was mixed with 1 ml of mature berries extract with different concentration (200,400,600,800, and 1000 µg/ml). The mixture was incubated at 25 $^{O}$C for 150 min. After incubation the reaction mixture mixed with 1.0 ml of pre-prepared Griess reagent [(1.0 ml sulfanilic acid reagent (0.33% in 20% glacial acetic acid at room temperature for 5 min with 1 ml of naphthylethylenediamine dichloride (0.1% w/v)]. The mixture is then incubated at room temperature for 30 min and its absorbance is measured at 546 nm. The decreasing absorbance indicates a high nitric oxide scavenging activity.

The amount of nitric oxide radical inhibition is calculated following this equation:

$$\% \text{ inhibition of NO radical} = (A_0 - A_1) / A_0 \times 100$$

Where, $A_o$: absorbance of control, $A_1$ is the absorbance of test.

### Hydrogen peroxide scavenging (H2O2) assay

Human beings are exposed to H2O2 indirectly via the environment nearly about 0.28 mg/kg/day with intake mostly from leaf crops. Hydrogen peroxide may enter into the human body through inhalation of vapor or mist and through eye or skin contact. H2O2 is rapidly decomposed into oxygen and water and this may produce hydroxyl radicals ($OH^-$) that can initiate lipid peroxidation and cause DNA damage in the body.

The ability of plant extracts to scavenge hydrogen peroxide can be estimated according to the reported method [8] [9].

A solution of hydrogen peroxide (40 MM) is prepared in phosphate buffer (50 MM pH 7.4). The concentration of hydrogen peroxide is determined by absorption at 230 nm using a spectrophotometer.

1 ml of mature berries extract with different concentration (200,400,600,800, and 1000 µg/ml) is added to hydrogen peroxide and absorbance at 230 nm is determined after 10 min against a blank solution containing phosphate buffer without hydrogen peroxide. The percentage of hydrogen peroxide scavenging is calculated as follows:

$\%$ scavenged (H2O2) = $(A_0 - A_1) / A_0 \times 100$

Where $A_0$ is the absorbance of control

$A_1$ is the absorbance of test.

### UV protective activity.

Preparation of extract: samples were prepared in 50ml distilled water and then taken sufficient berries; Extract juice, after that

filter the extract, and collect the filtrate. The UV absorption spectrum for the extract was obtained in the range of 200-400nm using UV-Spectrophotometer.

**RESULTS**

**Table1:In vitro anti-oxidant activity of Nitric oxide scavenging activity**

| Extract | In vitro antioxidant activity % inhibition<br>Nitric oxide scavenging activity | Ascorbic acid |
|---|---|---|
| Control | -- | -- |
| 200 µg/ml | 4.09 | 10.16 |
| 400 µg/ml | 11.47 | 16.40 |
| 600 µg/ml | 24.59 | 19.53 |
| 800 µg/ml | 28.68 | 31.25 |
| 1000 µg/ml | 31.14 | 35.15 |

**Table 2: In vitro anti-oxidant activity of $H_2O_2$scavenging assay**

| Extract | In vitro antioxidant activity % inhibition<br>$H_2O_2$ scavenging assay | Ascorbic acid |
|---|---|---|
| Control | -- | -- |
| 200 µg/ml | 34.50 | 19.68 |
| 400 µg/ml | 42.49 | 26.12 |
| 600 µg/ml | 53.80 | 31.96 |
| 800 µg/ml | 54.77 | 38.59 |
| 1000 µg/ml | 57.50 | 39.18 |

**Table 3: In vitro antisolar activity**

| Extract | Wavelength(nm) | Absorbance(max) |
|---|---|---|
| Premature | 223 | 2.337 |
| Mature | 222 | 1.049 |

**UV scanning of the both extracts showed very strong absorbance (1.5) with λmax at 223nm for immature and 222nmfor mature berries.**

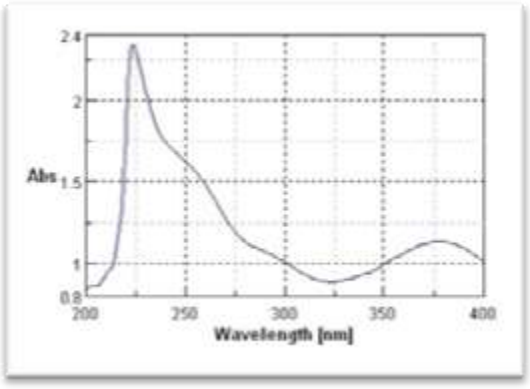


**Fig.1: Scanning spectra of extract on UV spectrophotometer of immature berries.**

**DISCUSSION**

It can be concluded that the proposed Antioxidant test method has been successfully employed for the direct monitoring of Berries of *Cestrum nocturnum*. The antioxidant activity by H2O2 scavenging was found to be significantly higher than that of Nitric oxide radical scavenging method. The developed test method provides reliable results with, without the need for complicated instrumentation.

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.

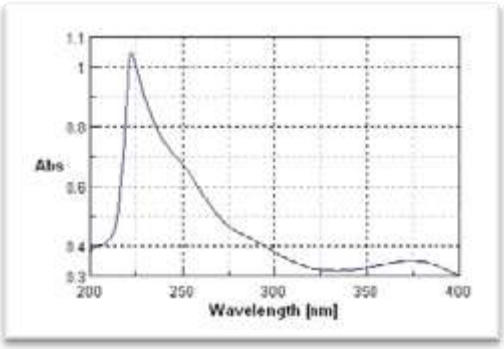


**Fig. 2: Scanning spectra of extract on UV – Spectrophotometer of Mature Berries**

**CONCLUSION**

Based on our results, it can be concluded that the percentage inhibition antioxidant activity of *Cestrum nocturnum* berries was found to be greater by H2O2 scavenging method as compared to Nitric oxide radical scavenging method. The proved activity of mature berries 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. Sies H. Oxidative stress: oxidants and antioxidants. Exp. Physiol., 1997; 82(2): 291–295.
2. Patil V. V., Patil S. B., Kondawar M. S., Naikwade N. S., Magdum C. S. Study of methanolic extract of flower of SpathodeacampanulataL.as an anti-solar, Int. J. Green Pharm. 2009;3 (3): 248-249.
3. Hortus, Third Cornell University, Western Garden Book , 2007 Ed
4. ChetanJawale, RambhauKirdak, LaxmikantDamaLarvicidal activity of Cestrum nocturnum on Aedesaegypti". Bangladesh Journal of Pharmacology. 2010; 5 (1): 39–40.
5. Virginia, H., Sarah, L.E., Rachel, J.S., Nathaniel, T., Joseph, S., Adam, E., Cecilia, G. Mitochondrial nitric-oxide synthase: role in pathophysiology. IUBMB Life 2003; 55 (10 &11): 599–603.
6. Marcocci, I., Marguire, J.J., Droy-lefaiz, M.T., Packer, L. The nitric oxide scavenging properties of Ginkgo biloba extract. Biochem. Biophys. Res. Commun. 1994; 201: 748–755.
7. Jadhav Shravan Y., Shirame Sachin P., Kulkarni Suresh D., PatilSandeep B., BhosaleRaghunath B. PEG mediated synthesis and biological evaluation of asymmetrical pyrazolecurcumin analogues as potential analgesic, anti-inflammatory and antioxidant agents,Chem. Biol. & Drug Des., 2015; 85 (3) ,2015:377-384.
8. Ruch, R.J., Cheng, S.J., and Klaunig, J.E. Prevention of cytotoxicity and inhibition of intracellular communication by antioxidant catechins isolated from Chinese green tea. Carcinogenesis, 1989; 10: 1003-1008.
9. Christova-Bagdassarian V L, Bagdassarian K S and Atanassova M S. Phenolic profile, antioxidant and antimicrobialactivities from the Apiaceae family (dry seeds). Mintage Journal of Pharmacy and Medical Science 2013; 2(4):26-31