GLOBAL JOURNAL OF BIOLOGY, AGRICULTURE & HEALTH SCIENCES
(**Published By**: Global Institute for Research & Education)
www.gifre.org

Stability & Fluorescent Studies of the Coloring Content of Flowers of *Nyctanthes Arbor Tristis*

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Abstract

Crocin is important commercially significant constituent of saffron, which is a Carotenoid glycoside (coloring compound). Crocin present in *Nyctanthes arbor-tristis* flowers will be of great significance. Herein, we studies to elucidate the stability and fluorescence property of Crocin by using different solvents including water extract of the flowers by spectroscopy and fluorimetry methods respectively. The compound seems to be fairly sensitive to sunlight, and ethanol /methanol extracts are more stable.

Key words- *Nyctanthes arbor tristis*, Column chromatography, Spectrophotometer, fluorescence study, Stability study.

Introduction

Nyctanthes arbor-tristis is a native found in Northern India, Nepal, Thailand and Southern Asia.[1][2][3] *Nyctanthes arbor-tristis i*s a Shrub or a small tree growing to 10m tall, with flaky grey bark. Leaves are opposite, simple, 6-12cm long and 2-6.5cm broad, with an entire margin. *Nyctanthes arbor-tristis* Linn is a small sacred ornamental tree known as Paarijaata across India for its fragrant white flowers [7, 8]Flowers are fragrant, with a 5-8 lobed white corolla with an orange-red centre, they are produced in clusters of 2-7 together, with individual flowers opening at dusk and finishing at dawn. Carotenoid glycoside named Crocin (coloring compound) is the main constituent present in saffron. Several biological activities are attributed to this compound. It is usually isolated from *Crocus sativus* which is highly expensive and not easily available. Isolation of crocin from *Nyctanthes arbor-tristis* flowers will be of great significance. Flowers can be used as a source of yellow color [7] [10] dye for clothing. The seeds, flowers and leaves possess immunostimulant[11], hepatoprotective, antileishmanial, antiviral, antioxidant[8], anti-arthritic and antimicrobial activities.[4] [9] Leaves have been used in Ayurvedic medicine to treat Sciatica, arthritis, fevers, various painful conditions and laxative.[5][6] It was reported that this coloring compound was present in corolla tubes of flowers of Nyctanthes arbor-tristis by Dhingra et al (1976). In this study, we put efforts to elucidate the stability and fluorescence property of crocin by using ethanol extracts of the flowers by spectroscopy and fluorimetry methods respectively.

Materials and Methods

Flowers were collected nearby area. The flowers were dried under shade, coarsely powdered, and stored under air tight container for further study. Solvents like Ethanol, Methanol, Acetone and others chemicals purchased from Merck, India.

Preparation of flower extract: Dried flower powder mixed with Ethanol, Methanol, Acetone and water at 40°–60°C in a Soxhlet apparatus for complete extraction. The resulting extracts was filtered, concentrated, dried, and stored in a desiccator for use in subsequent experiment.

Absorption spectra of flower extract at zero time:

UV- Vis Spectrophotometer is used to take the absorbance readings. Absorbance value of pure solvent (blank reading) is noted by taking each of the solvents. The spectral reading were taken with and without extract at a time interval of zero, 1hr, 4hrs, 8hrs, 12hrs and 24hrs at a wavelength range of400-500nm and absorbance values are noted.

Degradation under sunlight with time:

About 500milligms of flowers are taken in a Tray and exposed to sunlight. The absorbance readings of flower samples were taken after 1hr, 4hrs, 8hrs, and 10hrs respectively. Out of which 2 samples are taken in 2 separate test tubes containing 50ml of ethanol, extract is vortexed for 2 mins. One ml of vortexed extract taken out and diluted to 10ml and the absorbance readings are taken at 239nm at different time interval. Finally, the mean values are noted.

Fluorescence study:

Fluorescence Spectrophotometer is used to scan by adjusting the Excitation range of 250-290nm and Emission range of 400-600nm (in 5nm interval) and sensitivity of fluorimeter is adjusted to 0.3. Reading is taken by keeping the Excitation constant, next scan by changing the Emission wavelengths. Blank reading of pure ethanol is noted at different wavelengths. About 250mg of dried flower powder taken and vortexed in it in 2 ml of ethanol for 2mins and the final volume was made up to 10ml. About one ml of solvent extract is taken, diluted to 5ml and the fluorescence reading is noted.

Results

Figure1: Absorbance spectra of flowers of *Nyctanthes arbor tristis* in different solvents.

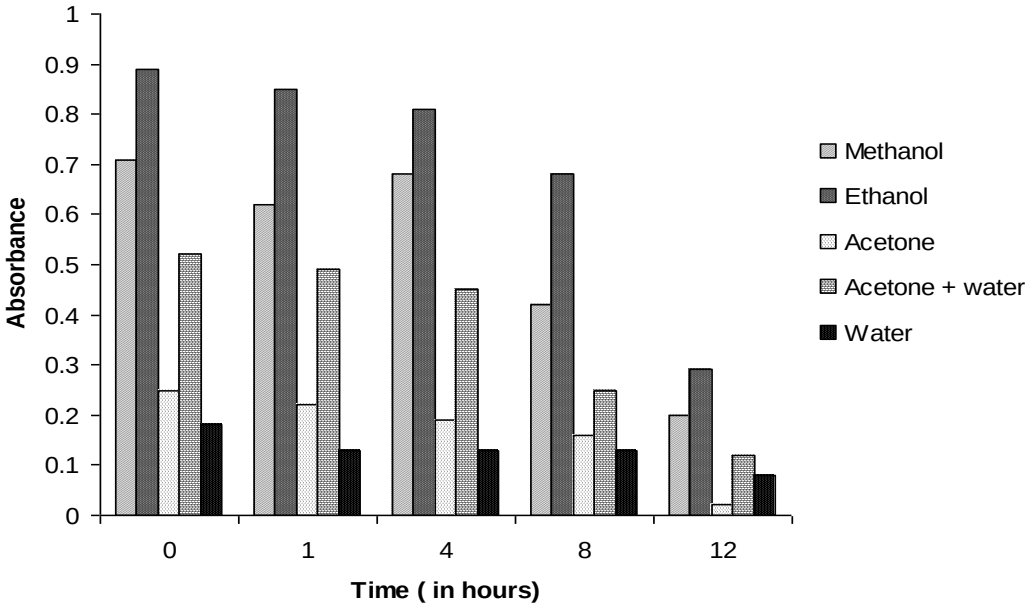


Figure 2: Absorbance spectra of flowers of *Nyctanthes arbor tristis* exposed to sunlight

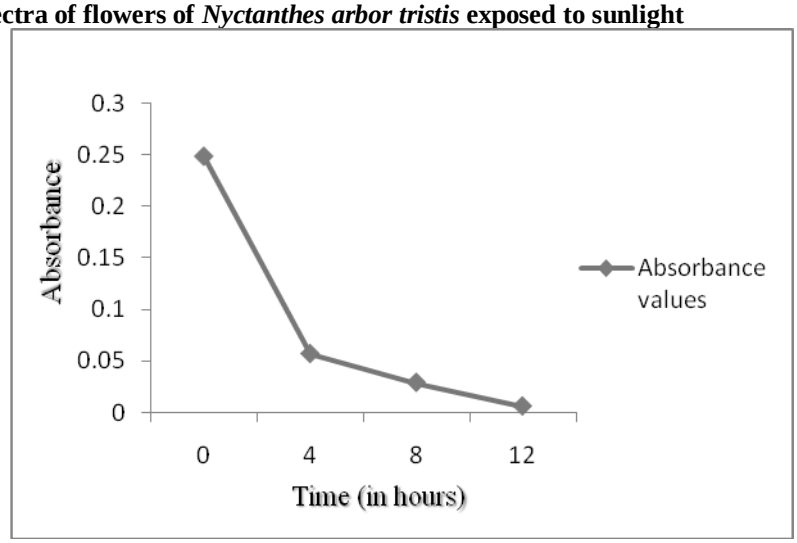
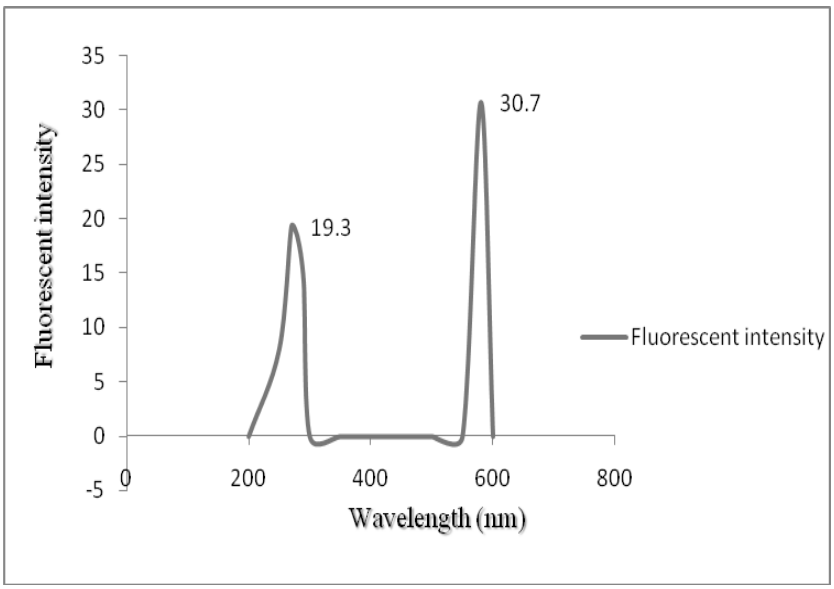


Figure -3: Fluorescent intensity spectrum of ethanol extract of the *Nyctanthes arbor tristis* flower



Discussion

The importance of medicinal plants in curing of diseases has been reported in the history of civilization. The keen interest in medicinal, spice and aromatic plants has been because of their safe and effective active principle [12]. It was reported that, various parts of the plant Nyctanthes arbortristis like seeds, leaves, flowers, bark and fruits have been investigated for their significant phytochemicals. Phytochemicals like flavanol glycoside, oleanic acid, essential oils, tannic acid, carotene, friedeline, lupeol, glucose, benzoic acid have been reported for significant, hepatoprotective, antileishmaniasis, antiviral, antifungal, antipyretic, antihistaminic, anti-malarial, antibacterial, anti-inflammatory, antioxidant activities[13]. Herein the results indicated that, the results of absorbance, fluorescent spectra shows that, the flowers are light sensitive and the absorbance goes on decreasing against time of exposure to Sun light. Herein Figure 1 shows the absorbance of different solvent extracts of the flower. Figure 2 showed the decrease in absorbance when the increase in time of exposure to sunlight. Figure 3 showed that, the fluorescence spectra of the ethanol extract of the flower at zero time.

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