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Research Article

**PHARMACOGNOSTIC AND PHYTO CONSTITUENT  
EVALUATION OF NELUMBO NUCIFERA LEAVES****Md. Jawed Ansari<sup>1</sup>, Dr. Vivekanand Katare\*<sup>1</sup>, Mr. Shivam Nema<sup>1</sup>,  
Mr. Prabhat Kumar Jain<sup>2</sup>**<sup>1</sup>Vivekanand College of Pharmacy, Bhopal (M.P.), <sup>2</sup>Scan Research Laboratories, Bhopal (M.P.)**Article Received:** December 2022    **Accepted:** December 2022    **Published:** January 2023**Abstract:**

*Herbal plants, are a new class of growth promoters and in recent years this feed additives have gained extensive attention in the feed industry. They are a wide variety of herbs, spices, and products derived thereof, and are mainly essential oils. Although numerous reports have demonstrated antioxidative and antimicrobial and immune stimulation efficacy in vitro, respective experimental in vivo evidence is still quite limited. Pharmacognosy is the study of medicines derived from natural sources, mainly from plants. It basically deals with standardization, authentication and study of natural drugs. Nelumbo nucifera, now placed in the mono-generic family Nymphaeaceae, has numerous common names (e.g. Indian lotus, Chinese water lily and sacred lotus) and synonyms (Nelumbium nelumbo, N. speciosa, N. speciosum and Nymphaea nelumbo). All parts of N. nucifera have many medicinal uses. Results of Fluorescence study showed the fluorescence activity of Nelumbo nucifera (leaves). The result of macroscopy indicated that the Nelumbo nucifera (leaves) are of yellow color with indistinct odor. Extraction of the plant was done by maceration process. The yield of extract obtained from samples using hydroalcoholic solvent is depicted in the table. The results of Thin layer Chromatography was noted and Rf value was calculated.*

**Key Words:** *Herbal Plants, Pharmacognosy, Nelumbo nucifera, Herbs, Fluorescence study***Corresponding author:****Vivekanand Katare**

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**INTRODUCTION:**

Herbs, herbal products, food additives and other dietary supplements derived from plants are widely consumed in many countries. The literature on intoxications from such behaviour is increasing. This article reviews some of the factors predisposing to intoxication from the use of herbs, with examples drawn largely from pyrrolizidine alkaloid-containing plants [1].

*Nelumbo nucifera*, now placed in the mono-generic family Nymphaeaceae, has numerous common names (e.g. Indian lotus, Chinese water lily and sacred lotus) and synonyms (*Nelumbium nelumbo*, *N. speciosa*, *N. speciosum* and *Nymphaea nelumbo*). All parts of *N. nucifera* have many medicinal uses. The leaf, rhizome, seed and flower are traditionally used for the treatment of pharyngopathy, pectoralgia, spermatorrhoea, leucoderma, small pox, dysentery, cough, haematemesis, epistaxis, haemoptysis, haematuria, metrorrhagia, hyperlipidaemia, fever, cholera, hepatopathy and hyperdipsia [2].

Pharmacognosy is the study of medicines derived from natural sources, mainly from plants. It basically deals with standardization, authentication and study of natural drugs. Most of the research in pharmacognosy has been done in identifying controversial species of plants, authentication of commonly used traditional medicinal plants through morphological, phytochemical and physicochemical analysis. The importance of pharmacognosy has been widely felt in recent times. Unlike taxonomic identification, pharmacognostic study includes parameters which help in identifying adulteration in dry powder form also. This is again necessary because once the plant is dried and made into powder form, it loses its morphological identity and easily prone to adulteration. Pharmacognostic studies ensures plant identity, lays down standardization parameters which will help and prevents adulterations. Such studies will help in authentication of the plants and ensures reproducible quality of herbal products which will lead to safety and efficacy of natural products [3].

**MATERIALS AND METHODS:****Collection of Plant:**

Leaves of *Nelumbo nucifera* were collected from local area of Bhopal in the month of February, 2022.

**Pharmacognostic Evaluation:****Fluorescence Study:**

The fluorescence characteristics of the powdered leaves with different reagents were studied under filtered U-V light.

**Microscopic study:**

The microscopic characteristics of the powdered leaves of *Nelumbo nucifera* was studied through light microscope.

**Macroscopic Study:**

The macroscopic characteristics such as color, odor, taste were studied.

**Extraction by maceration process:**

30 gram of leaves dried powdered of *Nelumbo nucifera* has been extracted with hydroalcoholic solvent (methanol: water, 70:30) using maceration process for 48 hrs, filtered and dried using vacuum evaporator at 40°C [4].

**Phytochemical Screening:**

Phytochemical examinations were carried out for all the extracts as per the standard methods [5].

**Qualitative chromatographic analysis:****Thin layer chromatography:**

T.L.C. is based on the adsorption phenomenon. In this type of chromatography mobile phase containing the dissolved solutes passes over the surface of stationary phase [6].

**RESULTS AND DISCUSSION:**

Results of Fluorescence study showed the fluorescence activity of *Nelumbo nucifera* (leaves). The result of macroscopy indicated that the *Nelumbo nucifera* (leaves) are of yellow color with indistinct odor. Extraction of the plant was done by maceration process. The yield of extract obtained from samples using hydroalcoholic solvent is depicted in the table 3. The results of Thin layer Chromatography was shown in table 5.

**Results of Fluorescence study: -****Table 1: Results of Fluorescence study of *Nelumbo nucifera* (Leaves)**

Sr. No.	Reagent	Normal Light	Short UV	Long UV
1.	Powder	Brown	Green	Black
2.	Powder + Distill water	Brown	Green	Black
3.	Powder+ NaOH	Brown	Green	Black
4.	Powder+ HCl	Brown	Green	Black
5.	Powder+ AlCl <sub>3</sub>	Brown	Green	Brown
6.	Powder+ Lead Acetate	Dark Brown	Green	Black
7.	Powder+ Copper acetate	Light Brown	Brown	Yellow
8.	Powder+ FC Reagent	Brown	Brown	Black
9.	Powder+ Wagner's reagent	Brown	Black	Black
10.	Powder+ H <sub>2</sub> O <sub>2</sub>	Dark Brown	Black	Brown

**Macroscopy of *Nelumbo nucifera*:****Table 2: Powder macroscopy of *Nelumbo nucifera* leaves**

Sr. No.	Characteristics	Observation
1.	Color	Yellow
2.	Odor	Indistinct

**Extraction of *Nelumbo nucifera*:**

Weight of plant: 35.6 gm

Solvent used: - Aqueous

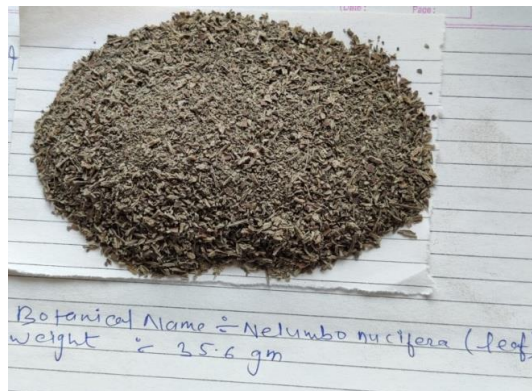
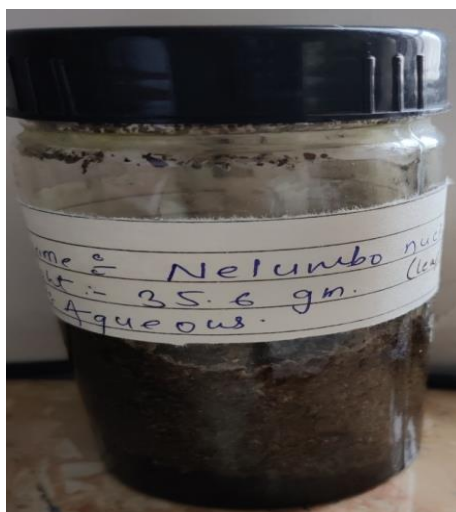
**Figure 1: Coarse Powder of *Nelumbo nucifera* (leaves)****Figure 2: Extraction by Maceration of *Nelumbo nucifera* (leaves)**

Table 3: % Yield of *Nelumbo nucifera*

S. No.	Solvent	% Yield
		Leaves extract
2.	Aqueous	4.60%

Table 4: Phytochemical screening of extracts of *Nelumbo nucifera*

S. No.	Constituents	Hydroalcoholic extract
		Leaves extract
1.	<b>Alkaloids</b> Dragendroff's test Hager's test	-ve -ve
2.	<b>Glycosides</b> Legal's test	+ve
3.	<b>Flavonoids</b> Lead acetate Alkaline test	+ve +ve
4.	<b>Phenol</b> Ferric chloride test	+ve
5.	<b>Proteins</b> Xanthoproteic test	-ve
6.	<b>Carbohydrates</b> Fehling's test	-ve
7.	<b>Saponins</b> Foam test	-ve
8.	<b>Diterpenes</b> Copper acetate test	+ve

Figure 3: Phytochemical test aqueous extract of *Nelumbo nucifera* (leaf)

**Results of thin layer chromatography of hydroalcoholic extract of *Nelumbo nucifera*:****Table 5: Calculation of R<sub>f</sub> Value (Quercetin)**

<b>Hydroalcoholic extract of <i>Nelumbo nucifera</i></b>		
<b>S. No.</b>	<b>Mobile phase</b> Toluene: Ethyl acetate: Formic acid (5:4:1)	<b>R<sub>f</sub> value</b>
1.	<b>(Quercetin)</b> Dis. travel by mobile phase= 5.0cm No. of spot at long UV= 1 No. of spot at short UV = 1 No. of spot at normal light= 1	Long- 0.56 Short- 0.56 Normal- 0.56
2.	<b>(Aqueous extract)</b> Dis. travel by mobile phase= 5.0cm No. of spot at long UV = 5 No. of spot at short UV = 4 No. of spot at normal light= 3	Long- 0.32, 0.48, 0.62, 0.68, 0.82 Short- 0.42, 0.52, 0.64, 0.68 Normal- 0.38, 0.54, 0.62

**CONCLUSION:**

*Nelumbo nucifera* Gaertn. is one of the most important medicinal plants used in various traditional medicines. *N. nucifera* is a natural source of many potent flavonoids exhibiting various effective pharmacological activities. Nowadays, many pharmacological activities such as anti-angiogenic, anti-cancer, anti-diabetic and anti-obesity activities of flavonoids isolated from this medicinal species have been described. However, most of these pharmacological activities still need further research investigations before leading to the discovery of potent drugs from the extracts of this plant species and their large-scale development. This research focused on the Pharmacognostic properties of *Nelumbo nucifera* leaves. This investigation also focused on the phytochemical constituents present and identification of the phyto constituents.

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