PHARMACOGNOSTIC AND PRELIMINARY COMPARATIVE PHYTOCHEMICAL SCREENING OF ETHANOLIC EXTRACT OF *Adenium obesum* AND *Gypsophila Paniculata*

By,

AVINASH SR -180091310

REEMA RICHARD -180091336

SREELAKSHMI K -180091350

VISHNU R -180091356

Project report submitted to

Kerala University of Health Sciences

In partial fulfilment of the requirements for the award of the Degree of

BACHELOR OF PHARMACY

Under the guidance of

MRS LISSY S,

Associate Professor

Department of pharmacognosy

St. Joseph's College of Pharmacy

Cherthala, Kerala,- 688524 India

FACULTY OF PHARMACY

KERALA UNIVERSITY OF HEALTH SCIENCES, THRISSUR-680596

JUNE 2023

ABSTRACT

Adenium obesum is considered as a medicinal plant belonging to the family Apocynaceae, and Gypsophila is a genus of flowering plant in the carnation family Caryophyllaceae. The study aims at the pharmacognostic and preliminary comparative phytochemical screening of an ethanolic extract of *Adenium obesum* and *Gypsophila paniculata*.

The present study includes standardization parameters such as macroscopic, microscopic, powder study, physiochemical analysis, and phytochemical screening. In the macroscopic study, the organoleptic character of the leaves was identified. In microscopic studies ,both qualitative and quantitative analysis has been conducted. In physiochemical analysis, ash values, extractive values, moisture content and phytochemical screening has been studied.

The phytochemical screening of ethanolic extract of the leaves of *Adenium obesum* and *Gypsophila paniculata* was performed. In adenium extract, the most prevalent phytochemical groups are cardiac glycoside, tannins, steroids, proteins, aminoacids, alkaloids, and organic acids; in *Gypsophila paniculata* extract, the groups present are carbohydrates, flavonoids, saponins, and organic acids. The study includes a comparative phytochemical screening of the leaves, and a further detailed study can be conducted to determine the pharmacological action of the corresponding plant.

Keywords :*Adenium obesum* ; *Gypsophila paniculata* ; pharmacognostical studies ; phytochemical screening.

INTRODUCTION

Now a days there is a renewed interest in drugs of natural origin simply because they are considered as green medicine and green medicine is always supposed to be safe. Another factor which emphasizes this attention is the incidences of harmful nature of synthetic drugs which are regarded as harmful to human beings and environment. The advantage of natural drugs is their easy availability, economic and less or no side effects but the disadvantage is that they are the victims of adulteration. The more effective the natural drug more is its demand and the chances of non-availability increases. To meet the growing demand, the natural drug is easily adulterated with low grade material. Adulteration or substitution is nothing but replacement of original plant with another plant material or intentionally adding any foreign substance to increase the weight or potency of the product or to decrease its cost. Therapeutic efficacy of medicinal plants depends upon the quality and quantity of chemical constituents. The misuse of herbal medicine or natural products starts with wrong identification. The most common error is one common vernacular name is given to two or more entirely different species. All these problems can be solved by pharmacognostic studies of medicinal plants. It is very important and in fact essential to lay down pharmacognostic specifications of medicinal plants which are used in various drugs. 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. [23]

In this research work, the plant *Adenium obesum* and *Gypsophila paniculata* was selected. *Adenium obesum* is considered as a medicinal plant belonging to the Apocynaceae family. Locally, it is known as desert rose and the plant is considered as a slow growing long-leaved plant. It is also known as an ornamental plant and is currently cultivated most humid countries. The plant grows well in rocky and sandy soils. The height of this species is about two to four meters. Initially, the bark is pale yellow but later turn into shades of grey and brown. The bark is smooth with gummy, white latex; branchlets glabrescent, pubescent at apex. The shape of the leaf is oval and spirally arranged, clustered at the end of branchlets.

Gypsophila is a genus of flowering plants in the carnation family, Caryophyllaceae. They are native to Eurasia, Africa, Australia, and the Pacific Islands. Gypsy is also known as baby breath. *Gypsophila paniculata* a much branched perennial herb upto 0.75m height, stems erect as ascending at the base, single to many in number, freely branching throughout, thickened at base to form caudex; leaves opposite ,lanceolate to linear –lanceolate, gradually tapering to a point, usually one nerved and covered on both sides with a dense "bloom" of glandular hairs; inflorescence a panicle like – like compound dichasium of small white flowers.

So the target of this present study is to identify the pharmacognostic and phytochemical components of leaves of *Adenium obesum* and *Gypsophlia paniculata* and their comparative review.[15]

STANDARDIZATION PARAMETERS

1.Organoleptic properties

Organoleptic evaluation can be done by means of sense organs, which provide the simplest as well as quickest means to establish the identity and purity to ensure quality of a particular drug. Organoleptic characters such as shape, size, colour, odour, taste and fracture of stem bark, leaf structure like margin, apex, base surface, venation and inflorescence, etc are evaluated.[23]

2. Macroscopic study

The macroscopic study is the morphological description of the plant parts which are seen by naked eye or magnifying lens.[23]

3. Microscopic study

The microscopic study is the anatomical study which is done by taking appropriate section of the plant parts under study. Each distinguishing character can be noted down, some of which are retained in the powder study also. Some of the chemicals which are used in obtaining clear sections are phloroglucinol, chloral hydrate, safranine, methyl orange etc.[23]

3. Powder study

Powder study is similar to microscopic study except here dried powder is taken instead of section of the plant. All the reagents used are also same like above.[23]

4..Physico-chemical analysis

The parameters which are studied are moisture content, loss on drying, total ash, acid-insoluble ash, alcohol and water-soluble extractive values, petroleum ether soluble extractive value, ethyl acetate soluble extractive value, acetone soluble extractive value, etc. Ash values are used to determine quality and purity of crude drug. It indicates presence of various impurities like carbonate, oxalate and silicate. The water soluble ash is used to estimate the amount of inorganic compound present in drugs. The acid insoluble ash consist mainly silica and indicate contamination with earthy material. Moisture content of drugs should be at minimal level to discourage the growth of bacteria, yeast or fungi during storage. Estimation of extractive values determines the amount of the active constituents in a given amount of plant material when extracted with a particular solvent. The extractions of any crude drug with a particular solvent yield a solution containing different phytoconstituents. The compositions of these phytoconstituents depend upon the nature of the drug and the solvent used. It also gives an indication whether the crude drug is exhausted or not.[23]

5. Phytochemical screening

Phytochemical analysis was carried out with ethanolic extract to identify the constituents using the standard procedures. All the experiments has been repeated in triplicate for the final confirmation of the result.

PLANT PROFILE

Adenium obesum

Figure(1):*Adenium obesum*

Taxonomical classification[17]

Kingdom	: Plantae
Subkingdom	: Tracheobionta
Superdivision	: Spermatophyta
Division	: Magnoliophyta
Class	: Magnoliopsida
Subclass	: Asteridae

Order :Gentianales

Family : Apocynaceae

Genus : Adenium

Species : obesum

Geographical source

Adenium obesum occurs from Senegal to Ethiopia and from Somalia to Tanzania. It also occurs in Egypt, Saudi Arabia, Oman and Yemen, including Socotra; it is uncertain whether it occurs naturally in West Africa or has been introduced and become naturalized.

Chemical constituents

Tannins ,steroids ,proteins, cardiac glycoside , aminoacids, alkaloids , tyrosin, oxalicacid

Uses

Adenium obesum produces a sap in its roots and stems that contains cardiac glycosides. This sap is used as arrow poison for hunting large game throughout much of Africa and as a fish toxin.[8]

Gypsophila paniculata

Figure(2)*:Gypsophila paniculata* [10]

Taxonomical classification

Kingdom	:Plantae
Phylum	:Mangnoliophyta
Class	:Magnoliopsida
Order	:Caryophyllales
Family	:Caryophyllaceae
Genus	:Gypsophila
Species	:paniculata

Geographical source

Gypsophila paniculata is native to central and eastern Europe and across central Asia as far as western China.

Chemical constituents

Carbohydrate, flavanoids, saponins

Uses

The genus is a source of saponins that can be used for many purposes, including the production of photographic film and hemolytic laboratory reagents. Their detergent qualities make them useful in soap and shampoo[9]