# PHARMACOGNOSTICAL EVALUATION AND PHYTOCHEMICAL PROFILING OF IMPORTANT PLANT SPECIES *ZIZHYPHUS OENOPLIA* L.

**A.M.ANANDA KUMAR, N.SASIKUMAR, R.RAKKIMUTHU, P.SATHISHKUMAR AND D.SOWMIYA**
PG and Research Department of Botany, NGM College, Pollachi.

## ABSTRACT

The present paper deals with determine the quality parameters and also to authenticate the species free from adulteration, the present study was carried out on pharmacognostically and phytochemically on three important medicinal plants available in this area *Ziziphus oenoplia* L. belongs to family Rhamnaceae. The pharmacognostical work includes the parameters such as morphological observations including root length, shoot length, no. of lateral roots, internodes length and leaf surface area were observed and tabulated. The anatomical parameters *viz.*, transverse section of the study plant was observed with the treatment of various chemicals and solvents. Similarly the powder studies were also carried out. Finally the qualitative phytochemical studies were carried out to know the presence some basic secondary metabolites in the extract. The extracts exhibited the presence of important phytochemicals viz., Alkaloids, Tannins, Saponins, Oils, Steroids and Terpenoids. Further the anatomical study and powder showed the characteristic colour change and physical changes determines the genuinity of the species.

**Keywords:** Phytochemicals, pharmacognosy, Alkaloids, *Zizhyphus oenoplia*

## INTRODUCTION

Medicinal plants are used by 80% of the world population for their basic health needs. India is the birth place of indigenous medicines such as Siddha, Ayurveda and Unani system. All those systems rely on medicinal plants. The medicinal plants a very importance place in day to day life of human beings through on the world from immemorial. The plants have become knowing or unknowingly become parts of the home remedial system. Hence the relationship with the plants was extended key and medicinal aspects. Traditional system of medicines was prepared from a single combination of more than one plant. The

efficacy of the drug depends upon the on quality of plant species, parts and biological property of medicinal plants which in turn depends upon the occurring as primary and secondary metabolites (Phuspa,2009). Intern, it is necessary to have detailed knowledge on medicinal plants used for preparedly a drug in every aspect of the medicinal plants are rich source of various chemical compounds present**.** Medicinal plants are still major parts of traditional medicinal systems in developing countries many infection disease are known to be treated with herbal remedies throughout the history of mankind. Even today plant materials continue to play a major role in primary health care as therapeutic remedies in many developing countries (Sukanya *et al.,* 2009). Medicinal plants which from backbone of traditional medicine have in the last few decades been the subject of very intense pharmacological studies. This has been brought about by the acknowledgement of the value of medicinal plant as potential source of new compounds of therapeutic values and as source of new compounds in drug development (Buduru Gowthami *et al.,* 2012)

The branch of pharmacology that deals with drugs in the form of crude or natural state of medicinal herbs or other plants for their original features is called pharmacognosy. It is also the study of medicines derived from natural sources, mainly from plants and 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 organoleptic, anatomical, morphological, phytochemical and some physicochemical analysis. Recently the importance of pharmacognosy in taxonomic identification, pharmacognostic study includes parameters which help in identifying adulteration in dry powder and extract form also. The importance of the study in plants is gained because when the plant was dried and made into powder form, it loses its morphological identity and easily prone to adulteration. The study ensures plants identity, lays down standardization parameters which will help and prevents adulterations 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 ensure 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. The pharmacognostic standardization parameters which are generally done are described below (Sumitra, 2014). The pharmacogonostic characters will be very specific to every

species, locality and environmental condition. The organoleptic study on the plants which will gives rise to reaction of live cells on various chemical treatments. Hence the study mainly gains its importance to know complete characters of the species and details of anatomical and powder level ingredients.

To determine the quality parameters and also to authenticate the species free from adulteration, the present study was carried out on pharmacognostically and phytochemically on three important medicinal plants available in this area *Ziziphus oenoplia* L. belongs to family Rhamnaceae respectively. Indeed these three plants belongs diverse families but inhabitates the similar soil and climatic conditions. The plants were very used for the various purposes in the villages. Commonly the indigenous people use these plants or allow the plants to grow as biofencing. The plants are doesn't need regular water supply and survive any type of soil. The artificial regeneration was poorly established but naturally the plants found The study plants are widely distributed in this area. The pharmacognostical work includes the parameters such as morphological observations including root length, shoot length, no. of lateral roots, internodes length and leaf surface area were observed and tabulated. The anatomical parameters *viz.*, transverse section of the study plant was observed with the treatment of various chemicals and solvents. Similarly the powder studies were also carried out. Finally the qualitative phytochemical studies were carried out to know the presence some basic secondary metabolites in the extract.

## MATERIALS AND METHODS

### Collection of plant materials:

For the present study the plant species, *Ziziphus oenoplia* belong to family *Rhamnaceae* respectively were collected from nearby areas of Pollachi and Gobichettipalayam and preserved accordingly as the study to be carried out. The plants were collected and shade dried and finely powdered for the powder studies. The fresh plant specimens were stored in a proper fixative like FAA till the sections to be made.

### Classification:

### Description

The plant belongs to the Rhamnaceae family (Ber family).Common name is jackal jujube. It is a very thorny straggling shrub with rusty-velvety young branches with paired thorns. Scandent shrubs, thorns many, recurved, branchlets densely silky hairy. Leaves 4-6.5 x 2-3 cm, ovate, apex acuminate, base oblique, 3

or 4 ribbed, densely fulvous hairy, sessile or shortly petioled. Flowers 3 mm across, shortly pedicelled, 6-20 in axillary clusters; sepals triangular, hispid outside; petals clawed, concave, greenish yellow; disk flat, glabrous. Drupe 6 x 6 mm, globose, black.

**Preparation of powder**

The clean and healthy plants were collected. The materials were shade dried and powdered using pulverizer. The finely powdered plant materials were stored properly under proper condition.

**Preparation of extract:**

The two study plants material was collected separately and dried under shade. The well dried plant material was powdered using pulverizer. The finely powdered plant parts were used to take hot extract by using soxhelet apparatus.

**Organoleptic studies:**

Microscopic and macroscopic observations of the study plants were carried out like according to Saha *et al.*, 2011.

**Microscopic analysis:**

Free hand transverse sections leaf, stem, internode, root, petiole were cut and fixed in FAA and then dehydrated by employing graded series of ethyl alcohol and tertiary butyl alcohol. Kunle *et al.*, 2012.

**Determination of Foaming index**

Some plant materials when shaken with water cause persistent foam which may be attributed to the presence of saponins in that material. The foaming ability of an aqueous solution of plant materials and their extracts is measured in terms of foaming index WHO guidelines.

An accurate quantity of about 1g of the coarse plant material was weighed and transferred into an Erlenmeyer flask containing 100ml of boiling water. The flask was boiled at moderate heat for 30min. The solution was cooled and filtered into a 100ml volumetric flask and sufficient distilled water was added to dilute to volume. The solution was poured into ten stoppered test tubes in successive portions of 1ml, 2ml, etc. upto 10ml, and the volume of the liquid in each tube was adjusted with water upto 10ml. The tubes were then stoppered and shaken in a length wise motion for 15sec (two shakes/sec) and allowed to stand for 15min. The height of foam was measured. If the height of the foam in every tube was less

than 1cm the foaming index was less than 100. If a height of foam of 1cm was measured in any test tube, the volume of the plant material decoction in this tube (a) was used to determine the index. If the height of the foam was more than 1cm in every tube, the foaming index was over 1000. In this case, the determination was repeated using a new series dilution of the decoction in order to obtain a result. The foaming index was calculated by using the following formula 1000/A where A was the volume in ml of the decoction used for preparing the dilution in the tube where foaming to a height of 1cm was observed

**Preliminary phytochemical analysis**

The obtained extract was screened for the presence of phytochemical such as alkaloids, tannins, flavonoids, saponins, glycosides, saponins, terpenoids, phenol and oil.

**a) Detection of alkaloids-Mayer's test (Sofowara *et al.,* 1993)**

The mercuric chloride (1.36g) was dissolved in 60 ml of distilled water 5g of potassium iodide in 10 ml of water. The two solutions were mixed and diluted to 100 ml of dilute hydrochloric acid and 0.1 ml of Mayer's reagent was added. Formation of yellowish buff colored precipitate confirmed the presence of alkaloids.

**b) Detection of Flavonoids-$H_2SO_4$ test (Harborne *et al.,* 1973)**

0.5mg of plants was treated with few drops of $H_2SO_4$. Formation of orange colour indicates that the presence of flavonoids.

**c) Detection of Glycosides- Kellar-killani test (Gokhale *et al*., 2008)**

0.5mg of plant extract was shaken with 1 ml of glacial acetic acid. A drop of ferric chloride and a drop of concentrated sulfuric acid were added. Green blue colour to upper layer and reddish brown colour at the junction of two layers indicates the presence of cardiac glycosides.

**d) Detection of tannins-$Fecl_3$ test (Mace and Gorbach, 1963; Ciulci, 1994)**

0.5mg of powder sample of each plant is boiled in 20 ml of distilled water in a test tube and filtered 0.1% $Fecl_3$ is added to the filtered samples and observed for brownish green or a blue black coloration which shows the presence of tannins.

**e) Detection of saponins - Vigorous shaking test (Brain and Turner, 1975)**

The extract (50 mg) is diluted with distilled water and made up 20 ml , the suspension is shaken in a graduated cylinder for 15 min. A two centimetre layer of foam indicates the presence of saponins.

**f) Detection of Terpenoids - Salkowski s Test (Salkowski and Balish, 1987)**

0.5mg of the extract of the leaves, flower and seeds was mixed with two mi of chloroform and $H_2SO_4$ (3 ml) was carefully added to form a layer. An appearance of reddish brown colour in the inner face was indicates that the presence of Terpenoids

**g) Detection of phenol-Ferric chloride test (Harborne, 1973)**

10 mg extract were treated with few drops of ferric chloride solution. Formation of bluish black colour indicates that the presence of phenol.

**h) Detection of steroids (Ciulci, 1994)**

Two ml of acetic anhydride was added to five mg of the extracts, with two ml of $H_2SO_4$. The colour was changed from vielot to blue or green in some samples indicates that the presence of steroids.

**Table: 1 Showing the quantitative on morphological feature**

| S.No | Plants name | Stem Length (cm) | Leaf rachis Length (cm) | Single leaf Length (cm) | Petiole Length (cm) | Thorn Length (cm) |
|---|---|---|---|---|---|---|
| 2 | *Ziziphus oenoplia* | 2 | 15 | 4.5 | 0.3 | 0.3 |

**Table: 2. Showing the organoleptic characters of study species**

| S.No | Plant | Part | Colour | Odour | Taste | Texture |
|---|---|---|---|---|---|---|
| 1 | *Ziziphus oenoplia* | Stem | Brown | Characteristic | Bitter | Fine |
| | | Leaf | Dark green | Characteristic | Bitter | Fine |

**Table:3 Showing the results of foaming test**

| S.No | Plant | Part | Foaming index (1cm) |
|---|---|---|---|
| 3 | *Ziziphus oenoplia* | Stem | <1 |
| | | Leaf | <1 |

<1 indicates the occurrence of persistent foam ability of the extract is below l cm