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Research Article

PHYTOCHEMICAL STUDY OF AERIAL PART OF DIFFERENT SPECIES OF ZIZIPHUS GENUS

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ABSTRACT

The leaves and barks powder are used as aerial part of Ziziphus ziziphus (l) karst and Ziziphus xyloporus, selected from Ziziphus genus were extracted with 95% ethanol for 48 hours through hot percolation method, total alcoholic extract are subjected for different Phytochemical tests for the of presence of secondary metabolites. The phytochemical analysis reveals presence of flavonoids, glycosides, saponins, phenols, lignins, sterols and tannins.

Keywords: *Flavonoids, Glycosides, Saponins, Tannins, Ziziphus Mauritiana Lam.*

INTRODUCTION:[1,2,3,4]

Plants are very important for human survival , plants are not only provides food, air, shelter, cloth but also cures different ailments of human and animals a from the very ancient times. About 297,326 plants species belong to the plant kingdom, one of the five kingdoms of living things. Plants are classified into smaller groups, according to shared characteristics. all plants share certain features, out of which 199,350 species belongs to flowering angiosperm plants. *ziziphus* is a genus of about 40 species of spiny shrubs and small trees in
the buckthorn family, rhamnaceae.
The rhamnaceae are a large family of flowering angiosperm plants, mostly trees, shrubs, and some vines, commonly called the buckthorn family the family contains about 55 genera and 950 species. the rhamnacee have a worldwide distribution, but are more common in the subtropical and tropical regions. Zizyphus is used for improving muscular strength and weight, for preventing liver diseases and stress ulcers, and as a sedative.

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Jujube is also used for various skin conditions including dry and itchy skin, purpura, wounds, and ulcers; digestive problems including lack of appetite and diarrhea; and circulatory problems including high blood pressure and anemia. Other uses are for fatigue, hysteria, fever, inflammation, asthma, and eye diseases.

MATERIAL AND METHODS

Collection, authentication and preparation of plant material:

Ziziphus ziziphus (L) Karst and Ziziphus xyloporus wild were collected and authenticated by qualified botanist. After authentication, around 1 kg of twigs and leaves were collected; after collection , aerial plant`s parts and dust was removed and plant`s parts were kept for shade drying, after complete drying the drug was stored in a well closed container away from sun light. Drying bark was totally peeled off from branches and dried stem part was converted into pieces manually after that these pieces were exposed to grinding and coarse powder was stored in well closed container away from sun light.

Standardization of Stem and Leaves Powder:

Extractive values [5,6,8]

The determination of Extractive values helps to determine the amount of soluble constituents in a given amount of medicinal plant material, when extracted with solvents.

The extraction of any crude drug with a particular solvent yields a solution containing different phytoconstituents. The composition of these phytoconstituents in that particular solvent depends upon the nature of drug and solvent used. The use of single solvent can also be used by means of providing preliminary information of quality of a particular drug sample.

Alcohol soluble extractive value: 5g of shade-dried drug powder was macerated with 100ml of 95% ethanol in a closed flask, shaking frequently during the first 6hrs and allowed to stand for 18hrs. Thereafter it was filtered rapidly taking precaution against loss of ethanol. Evaporated 25ml of filtrate to dryness in a tared flat bottom shallow dish, dried at 105^0C and weighed. Percentage ethanol soluble extractive was calculated with reference to the shade-dried plant powder.

Water soluble extractive value: 5g of shade-dried drug powder was macerated with 100ml of water in a closed flask, shaking frequently during the first 6hrs and allowed to stand for 18hrs. Thereafter it was filtered rapidly. Evaporated 25ml of filtrate to dryness in a tared flat bottom shallow dish, dried at 105^0C and weighed. Percentages of extractive values were calculated with reference to the shade-dried leaf powder.

Chloroform Soluble Extractive: Proceeded as directed for the determination of alcohol-soluble extractive, used chloroform instead of alcohol.

Ethyl acetate extractive: Proceeded as directed for the determination of alcohol-soluble extractive, used benzene instead of alcohol

Petroleum Ether soluble (40-60^{0}c) extractive: Proceeded as directed for the determination of alcohol-soluble extractive, used petroleum ether (40^0-60^0C) instead of alcohol.

Moisture content [6,8]

An accurately weighed quantity of the shade-dried coarsely powdered *Pandanus odoratissimus* L f. leaf powder was taken in a tared glass bottle and the initial weight was taken. The crude drug was heated at 105^0C in an oven and weighed. This procedure was repeated till a constant weight was obtained. The moisture content of the sample was calculated as percentage with reference to the shade-dried material.

Ash values [5,6,8]

Total ash : 2g of accurately weighed quantity of the shade-dried coarsely powdered leaf of *Pandanus odoratissimus L f.* was taken in a tarred silica crucible and incinerated at a temperature not exceeding 450^0C until free from carbon, cooled and weighed. The percentage of total ash was calculated with reference to shade-dried leaf powder.

Acid-insoluble ash: Total ash obtained was boiled for five minutes with 25 ml of dilute Hydrochloric acid. The insoluble matter was collected on an ash-less filter paper, washed with hot water and ignited, cooled and weighed. The percentage of acid insoluble ash was calculated with reference to shade-dried leaves powder..

Water-soluble ash:

Total ash obtained was boiled for five minutes with 25ml of distilled water, cooled and collected the insoluble matter on an ash-less filter paper, washed with hot water and ignited for 15 minutes at temperature not exceeding 450^0C. Subtracted the weight of the insoluble ash. The percentage of water-soluble ash was calculated with reference to shade dried leaves powder.

Sulphated ash:

Silica crucible is heated to redness for 10 minutes; cooled and weighed. 1 gram of air-dried leaf powder is placed in silica crucible, moistened with sulphuric acid, ignited gently, again moistened with sulphuric acid and ignited at about 800^0C. Cooled and weighed, once again ignited for 15 minutes and weighed. The percentage of sulphated ash was calculated with reference to air-dried leaf powder.

Extraction:[9]

Leaves and stems of *Ziziphus ziziphus (l) karst* and *Ziziphus xyloporus*, were carefully washed under running tap water and dried in shade for two weeks. Dried leaves and stem were

powdered, sieved (#40) and stored in an air tight container at room temperature. Dried powder was then extracted sequentially with petroleum ether, alcoholic, and water by using soxhlation method.The extracts were concentrated to dryness using Rotary evaporator. followed by subjected to different qualitative chemical tests to establish the presence of a mixture of phytoconstituents i.e. alkaloids, glycosides, carbohydrates, phenolics and tannins, phytosterols, fixed oils, fats, proteins an amino acids, flavonoids, saponins, gums and mucilage by means of detection methods.

Preliminary Phytochemical Investigation : [5,10]

Phytochemical screening of different extracts was carried out as per reported methods.

RESULT AND DISCUSSION

As both the plants Ziziphus ziziphus (L) Karst and Ziziphus xyloporus wild are common plants and used for food purposes from ancient time, so the toxicity is very less. **Physicochemical parameters**

Various physico-chemical parameter of powdered drug has been investigated and reported in Table 1&2. Moisture content of drugs might be at minimum level to dispirit the reduction of bacteria, yeast or fungi through storage. Ash values used to find out quality and purity of unsophisticated drug. It indicates the existence of a mixture of impurities like carbonate, oxalate and silicate. The acid insoluble ash consist mainly silica and indicate contamination with earthy material. The water soluble ash is used to estimate the amount of inorganic elements present in drugs. The extractive values are valuable to estimate the chemical constituents present in the crude drug and furthermore assist in evaluation of definite constituents soluble in a particular solvent. The outcome of extractive value of powdered drug in different solvent obtained by successive extraction reported in Table 1&2. All extract subjected to qualitative chemical test and results be exposed in Table 3&4.

Table-1: Physicochemical parameters of Leaves and Stem powder of Ziziphus ziziphus.

Sl. No.	Parameters	Observation	
		Leaves powder	Leaves powder
I	Physical Tests		
	Nature	Coarse powder	Coarse powder
	Colour	Greenish Brown	Light Brown
	Odour	Aromatic	Aromatic
	Taste	Astringent	Astringent
II	Extractive Value		
	Aqueous	10.634% w/w	12.212% w/w
	Alcoholic	22.321%w/w	19.246%w/w
	Chloroform	6.321%w/w	8.468%w/w
	Ethyl acetate	10.041%w/w	13.982%w/w
	Pet. ether (40-60^{o}C)	2.206%w/w	6.214%w/w
III	Loss on drying	5.204%w/w	6.124%w/w
IV	Ash values		
	Total ash	6.734%w/w	5.487%w/w
	Acid insoluble ash	0.66%w/w	0.44%w/w
	Water soluble ash value	21.13%w/w	19.24%w/w

Table-2: Physicochemical parameters of Leaves and Stem powder of Ziziphus xyloporus.

Sl. No.	Parameters	Observation	
		Leaves powder	Stem powder
I	Physical Tests		
	Nature	Fine powder	Fine powder
	Colour	Greenish Brown	Light Brown
	Odour	No	No
	Taste	No	No
II	Extractive Value		
	Aqueous	10.235% w/w	12.634% w/w
	Alcoholic	13.041%w/w	19.321%w/w
	Chloroform	9.120%w/w	8.321%w/w
	Ethyl acetate	10.042%w/w	13.041%w/w
	Pet. ether (40-60^{o}C)	8.302%w/w	6.206%w/w
III	Loss on drying	6.405%w/w	6.204%w/w
IV	Ash values		
	Total ash	6.246%w/w	5.734%w/w
	Acid insoluble ash	0.77%w/w	0.55%w/w
	Water soluble ash value	21.12%w/w	19.13%w/w

Table-03: Results of Phytochemical analysis of Ziziphus ziziphus (L) Karst

Chemical Tests	Leaves Extracts			Stem Extracts		
	Pet. Ether	Alcohol	Aqueous	Pet. Ether	Alcohol	Aqueous
Test for Sterols	+	+	-	+	+	-
2. Test for Steroidal glycosides	-	+	+	-	+	+
3. A) Test for Triterpenoids	-	+	-	-	+	-
B) Test for Triterpenoid Glycosides	-	+	+	-	+	+
4. Test for Glycosides						
i. Cardiac glycosides	-	-	-	-	-	-
ii.Anthraquinone Glycosides	-	-	-	-	-	-
5. Test for Saponins	-	-	+	-	-	+
6. Test for Flavonoids	-	+	-	-	+	-
7. Test for Carbohydrates	-	+	+	-	+	+
8. Test for Alkoloids	-	+	+	-	+	+
9. Test for Phenolics and Tannins	-	-	+	-	-	+
10. Test for Lipid	-	-	-	-	-	-
11. Test for Proteins	-	+	+	-	+	+
12. Test for free amino acids	-	-	-	-	-	-

Note: "+" Present, "-" Absent.

Table-04: Results of Phytochemical analysis of Ziziphus xyloporus wild

Chemical Tests	Stem Extracts			Leaves Extracts		
	Pet. Ether	Alcohol	Aqueous	Pet. Ether	Alcohol	Aqueous
1.Test for Sterols	+	-	-	+	-	-
2. Test for Steroidal glycosides	-	-	-	-	-	-
3. A) Test for Triterpenoids	-	-	-	-	+	-
4. Test for Glycosides	-	-	-	-	+	-
5. Test for Saponins	-	+	+	-	+	+
6. Test for Flavonoids	-	+	-	-	+	-
7. Test for Carbohydrates	-	+	+	-	+	+
8. Test for Alkoloids	-	+	-	-	+	-
9. Test for Phenolics and Tannins	-	-	+	-	+	+
10. Test for Lipid	-	-	-	-	-	-
11. Test for Amino Acid	-	-	-	-	-	-
12. Gum and Musilage	-	-	+	-	-	+

Note: "+" Present, "-" Absent.

The result shows that maximum constituents found ethonalic extract of *Zizyphus xylopyrus* including phenols, flavonoids and terpenoids. Such preliminary phytochemical screening was helpful in prediction of nature of drugs and also useful for the detection of different constituents present in different polarity solvent. So it could be helpful to extract out particular constituents by solvent. In present research a variety of physicochemical parameters and phyto-chemical screening were performed. Various physicochemical parameters have been calculated and reported in the present studies. Results of phytochemical evaluation clearly reveal the occurrence of alkaloids,tannins, cardiac glycosides saponins and terpenoids.

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