

## PRELIMINARY PHYTOCHEMICAL SCREENING OF MEDICINAL PLANT *ZIZIPHUS MAURITIANA* LAM. FRUITS

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### ABSTRACT

The present paper shows the medical importance of *Ziziphus mauritiana* Lam. The plant fruit compounds were extracted with petroleum ether, chloroform, methanol, 95% ethanol and distilled water for 48 hours help of cold percolation method and found different types of secondary metabolites as flavonoids, glycosides, saponins, phenols, lignins, sterols and tannins were presented.

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

### INTRODUCTION

Plants are part of life. Without them nobody can live. Mostly people believe in ayurvedic or unani medicines because they do not show any side effects compared to allopathic medicines. When a plant has an antibiotic properties it is called medicinal plants. About 80% of the world population use traditional medicines, which are predominantly based on plant materials [WHO; 1993]. These materials are primarily and secondarily metabolites.

In India, different regions have specific features according to the climatic conditions. These plants including medicinal plants are also used as a feeding for animals. They are indirectly shown by their effects by which animals do not suffer by any types of diseases. Growing plants are one of the cheapest sources of feeding for animals having crude proteins of 14-25% [Abdu SB. *et. al* 2007, Simbaya J; 2002]. These plants provide vitamins and minerals which are lacking in grassland pastures [Keay RW; 1989].

*Ziziphus* is one of which that is found in all over the world. Different types of morphological changes are found cause to temperature and climate changes. According to their morphological change, the species names were decided. *Ziziphus mauritiana* Lam. is one of which that is grown in dry places. It is generally used for feeding by cattle and camels and goats and get resistance power against different types of pathogens [Morton J., 1987]. *Ziziphus mauritiana* Lam. belongs to the family of *Ziziphus* belongs to the kingdom; plantae, order; rosales, division; magnoliophyta, class; magnoliopsida, family; rhamnaceae, genus; *Ziziphus*, species; mauritiana.

*Ziziphus mauritiana* Lam. is also called jujube tree [Morton; 1987, Michel 2002]. All the parts of this plant are very effective against the different types of diseases. Its leaves are useful in the treatment of diarrhea, wounds, abscesses, swelling and gonorrhoea [Michel; 2002]. The leaves *mauritiana* are also used in the treatment of liver diseases, asthma and fever [Morton; 1987]. Carbohydrates, starch, proteins, sugar, mucilages and vitamins are abundantly found in *ziziphus* species [Clifford S.C. Paper- Characterization; 2002]. *Ziziphus mauritiana* Lam. fruits can be used in the treatment of liver [Dahiru, D. *et.al* 2005].

*Ziziphus mauritiana* Lam. fruiting time is February to March ending and the colour is red with more juicy as like litchi. The fruit has been used as anodyne, sedative, tonic anticancer, potent wound healer. It has also been used against asthma [J. Morton; 1987, E. W. M. Verheij and M. Calabura; 1991]. The fruit [A. R. Ndhala; 2006] leaves [D. Dahiru and O. Obidoa; 2007] and seeds [A. Bhatia and T. Mishra; 2009] extracts have been exhibit antioxidant activity whereas bark [E. Pisha *et. al* 1995] is reported to cytotoxicity against different cancer cell lines.

### MATERIAL AND METHODS

#### Collection of Plant Material

*Ziziphus mauritiana* Lam. is found all over the world. I had collected the plant ripped fruits from Mandsaur district, Madhya Pradesh. Mandsaur District forms the northern projection of Madhya Pradesh. It lies between the parallels of latitude 23° 45' 50" North and 25° 2' 55" North, and between the meridians of longitude 74° 42' 30" East and 75° 50' 20" East.

#### Preliminary Screening of Secondary Metabolites

The ripped fruits were dried and powdered using mixer grinder, and subjected to cold percolation process for 48 hours with petroleum ether, chloroform, 95% ethanol, methanol and distilled water. After this process, the extracts were filtered and used for preliminary phytochemical screening such as alkaloids (Iodine, Wagner, and Dragendorff's test), flavonoids (Pew's, Shinoda and NaOH tests), glycosides (Keller-killani, Conc. H<sub>2</sub>SO<sub>4</sub>, and Molisch tests), saponins (Foam and Haemolysis test), sterols (Liebermann- Burchard, and Salkowski tests), tannins (Gelatin and Lead acetate test), Lignin (Labat and Lignin tests), Phenols (Ellagic acid and Phenol tests) were carried out [Shashank Bhatt *et. al*, 2011].

#### Preliminary Screening of Phytochemical Test

##### Phytochemical Screening

The filtrate obtained was subjected to Preliminary Phytochemical screening.

##### Test for Alkaloids

**Iodine Test:** Mix 3 ml test solution and added few drops of dilute iodine solution. Blue colour appears; it disappears on boiling and reappears on cooling [Khandewal K.R., 2008].

**Wagner's Test:** To 2-3 ml extract with few drops Wagner's reagent. Formation of reddish brown precipitate indicates the presence of alkaloids [Kokate C. K. *et. al*; 2001].

**Dragendorff's Tests:** To 2-3 ml extract, add few drops Dragendorff's reagent Formation of orange brown precipitate indicates the presence of alkaloids [Kokate C. K. *et. al*; 2001].

##### Test for Flavonoids

**Pew's Tests:** To 2-3 ml extract, added zinc powder in a test tube, followed by dropwise addition of conc. HCl. Formation of purple red or cherry colour indicates the presence of flavonoids [Peach K., Tracey MV. 1956].

**Shinoda Tests:** To 2-3 ml extract, few fragments of magnesium metal were added in a test tube, followed by dropwise addition of

concentrate HCl. Formation of magenta colour indicated the presence of flavonoids [Kokate C. K. et. al; 2001].

**NaOH Tests:** To 2-3 ml of extract, few drops of sodium hydroxide solution were added in a test tube. Formation of intense yellow colour that became colourless on addition of few drops of dilute HCl indicated the presence of flavonoids [Khandewal K.R., 2008].

#### Test for Glycosides

**Keller-Kiliani Test:** To 2 ml extract, add glacial acetic acid, one drop 5% FeCl<sub>3</sub> and conc. H<sub>2</sub>SO<sub>4</sub>. Reddish brown color appears at junction of the two liquid layers and upper layer appears bluish green indicates the presence of glycosides [Kokate C. K. et.al; 2001].

**Glycosides test:** To small amount of extract, add 1 ml water and shake well. Then aqueous solution of NaOH was added. Yellow colour appeared that indicates the presence of glycosides. [Treare GE, Evans WC. 1985].

**Concentrate H<sub>2</sub>SO<sub>4</sub> Test:** To 5ml extract, add 2ml glacial acetic acid, one drop 5% FeCl<sub>3</sub> and conc. H<sub>2</sub>SO<sub>4</sub>. The appearance of brown ring indicates the presence of glycosides [Khandewal K.R., 2008].

**Molisch's Test:** To 1 ml of extract, 2 drops of Molisch's reagent was added in a test tube and 2 ml of concentrate H<sub>2</sub>SO<sub>4</sub> was added carefully keeping the test tube slightly curved. Formation of violet ring at the junction indicated the presence of glycosides [Kokate C. K. et. al; 2001].

#### Test for Phenols

**Ellagic Acid Test:** The test solution was treated with few drops of 5% (w/v) glacial acetic acid and 5% (w/v) NaNO<sub>2</sub> solution. The solution turned muddy or niger brown precipitate occurred in the extract indicated the presence of phenols solution [Gibbs R.D., 1974].

**Phenol Tests:** To 0.5 ml of FeCl<sub>3</sub> (w/v) solution was added to 2 ml of test solution, formation of an intense colour indicated the presence of phenols [Gibbs R.D., 1974].

#### Test for Lignins

**Lignin test:** To 2 ml of 2% (w/v) furfuraldehyde was added to the test solution, formation of red colour indicated the presence of lignin [Gibbs R.D., 1974].

**Labat test:** The test solution was mixed with gallic acid; it developed olive green colour indicating the positive reaction for lignins [Gibbs R.D., 1974].

#### Test for saponins

**Foam Test:** The extract was diluted with 20 ml of distilled water and it was shaken in a graduated cylinder for 15 minutes. A 1 cm. layer of foam indicated the presence of saponins [Kokate C. K. et. al; 2001].

**Haemolysis Tests:** - Add leaves extract to one drop of blood placed on glass slide. Hemolytic zone appears [Kokate C.K., 1994].

#### Test for Sterols

**Liebermann-Burchard Test:** Mix 2ml extract with chloroform. Add 1-2 ml acetic anhydride and 2 drops concentrated H<sub>2</sub>SO<sub>4</sub> from the side of the test tube. First red, then blue and finally green colour indicated the presence of sterols [Kokate C. K. et. al; 2001].

**Salkowski's Test:** To 2 ml of extract, add 2ml chloroform and 2 ml concentrated H<sub>2</sub>SO<sub>4</sub> and was shaken well. Chloroform layer appeared red and acid layer showed greenish yellow fluorescence indicated the presence of sterols [Kokate C. K. et. al; 2001].

#### Test for Tannins

**Gelatin Test:** To the extract, gelatin (gelatin dissolves in warm water immediately) solution was added. Formation of white precipitate indicated the presence of tannins [Treare GE, Evans WC. 1985].

**Lead acetate test:** To 5 ml of extract, add few drops of 10% lead acetate solution were added. Formation of yellow or red precipitate indicated the presence of tannins. [Treare GE, Evans WC. 1985].

### RESULT AND DISCUSSION

The plant ripped fruits were powdered and subjected to cold percolation with petroleum ether, chloroform, methanol, 95% ethanol and distilled water for 48 hours. The results of the phytochemical screening of fruits extract of *Ziziphus mauritiana* Lam. were presented in Table-1. Different types of secondary metabolites such as flavonoids glycoside, phenol, lignin, saponins, sterols and tannins were present while alkaloids was absent in *Ziziphus mauritiana* Lam. [Table-1]

Table 1: Phytochemical study of *ziziphus mauritiana* lam. Fruits

Test	Petroleum Ether	Chloroform	Methanol	95% Ethanol	Distilled water
<b>Alkaloids</b>					
Iodine Test	-ve	-ve	-ve	-ve	-ve
Wagner's Test	-ve	-ve	-ve	-ve	-ve
Dragendorff Test	-ve	-ve	-ve	-ve	-ve
<b>Flavonoids</b>					
Pews Test	-ve	-ve	-ve	-ve	-ve
Shinoda Test	-ve	-ve	-ve	-ve	-ve
NaOH Test	-ve	-ve	+ve	+ve	-ve
<b>Glycosides</b>					
Keller-Killani Test	-ve	+ve	+ve	+ve	-ve
Glycosides Test	-ve	-ve	+ve	+ve	-ve
Conc. H <sub>2</sub> SO <sub>4</sub>	-ve	+ve	+ve	+ve	-ve
Molisch's Test	-ve	-ve	-ve	-ve	-ve
<b>Phenol</b>					
Ellagic Test	-ve	-ve	-ve	-ve	-ve
Phenol Test	-ve	-ve	-ve	+ve	+ve
<b>Lignin</b>					
Lignin Test	-ve	-ve	+ve	+ve	-ve
Labat Test	-ve	-ve	+ve	+ve	-ve
<b>Saponins</b>					
Foam Test	-ve	-ve	+ve	+ve	-ve
Haemolysis Test	-ve	-ve	-ve	+ve	-ve
<b>Sterols</b>					
Liebermann- Burchard Test	-ve	-ve	-ve	-ve	-ve
Salkowski Test	-ve	+ve	+ve	+ve	-ve
<b>Tannins</b>					
Gelatin Test	-ve	-ve	+ve	-ve	-ve

Lead Acetate Test	-ve	-ve	+ve	+ve	+ve
					

Fig. A: The fruit of *Ziziphus mauritiana* lam.

Tannins have general antimicrobial and antioxidant activities [Rievere et al., 2009]. Current reports show that tannins may have potential value such as cytotoxic and antineoplastic agents [Aguinaldo et al., 2005]. Saponins have antifungal properties [Aboada and Efuwape, 2001; Mohanta et al., 2007]. These contents are shown different type of activity against different pathogens. Therefore, it can be used in the treatment of diseases.

Saponins are used in hypercholesterolemia, hyperglycemia, antioxidant, anticancer, anti-inflammatory and weight loss etc. according to medical field. It is a bioactive antibacterial agent of plants [Mandal et al. 2005; Manjunatha, 2006].

#### CONCLUSION

According to the research works on *Ziziphus mauritiana* Lam. fruit, I have concluded that different types of secondary metabolites are present that have effective functions on different type of diseases. It shows very effective function against pathogens. Hence, its fruit can be used in the treatment of liver diseases according to their function and also used in cancer treatment. The fruits should be used in the preparation of medicinal drug for the treatment of different types of cancer, antimicrobial and antifungal activity.

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