

## PHYTOCHEMICAL INVESTIGATION OF AQUEOUS FRUIT EXTRACTS OF *DREGEA VOLUBILIS* (LINN.) BENTH

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### ABSTRACT

*Dregea volubilis* (Linn.) Benth. (Asclepiadaceae) has been used in traditional and Ayurvedic system of medicine for healing various diseases like general debility alternate, refrigerant, skin diseases and haemorrhoids. The present study was aimed to evaluate the medicinal valued biomolecules in the aqueous extracts of fruit of *Dregea volubilis*. Results claim the presence of Alkaloids, Terpenoids, Steroids, Coumarins, Tannins, Flavonoids, Proteins, Carbohydrates, Glycosides, Phytosterol, Anthocyanidins, Amino acids, Phenolic compounds Lipids and certain unidentified compounds. Our investigation revealed that *Dregea volubilis* is an important source of many therapeutically and pharmacologically active medicinally potent biochemical constituents.

**Keywords:** *Dregea volubilis*, Aqueous Extract, Phytochemical Analysis.

### INTRODUCTION

In modern medicine also, plants occupy a very significant place as raw material for some important drugs although synthetic drugs and antibiotics have brought about a revolution in controlling different diseases. Plants used in traditional system of medicine of pharmaceutical houses in collected from wild sources (Singh, 2003). Medicinal plants are the richest bioresource of drugs of traditional system of medicines, pharmaceutical intermediates and chemical entities for synthetic drugs (Ncube *et al.*, 2008). Medicinal plants form a large group of economically important plants that provide the basic raw materials for indigenous pharmaceuticals (Aiyelaagloe, 2001). According to the WHO the first step for identification and purification of herbal drugs is the pharmacognostic (macroscopic and microscopic) studies which are essential for any phytopharmaceutical products were used for standard formulation (WHO, 1998). Preliminary phytochemical studies are helpful in finding out chemical constituents in the plant material that may well lead to their quantitative estimation (Raiv *et al.*, 2013; Lamaeswari and Ananti, 2012). Phytochemicals are used as templates for lead optimization programs, which are intended to make safe and effective drugs (Balunas, 2005). Hence, it is desirable to know the phytochemical composition of the plant material before testing its efficacy for medicinal purpose.

*Dregea volubilis* (Linn.) Benth. is an important medicinal twinning glabours perennial herb belonging to family Asclepiadaceae. The main aim of the present research was to study the phytochemical studies of fruit of *Dregea volubilis*.

The whole plants are extensively used in indigenous system of medicine. The whole plant used for general debility (Madhava chetty *et al.*, 2013). The concentrations of the bioactive compounds in different parts of the plant have not been investigated and this is needed to guide users in targeting the fruit with the highest concentration for therapeutic and pharmacognostic uses.

### MATERIALS AND METHODS

The plant of *Dregea volubilis* matured fruits was collected during the month of April from wild in different localities of in and around the Tirupati. The botanical identification of the taxa was carried out by using regional and local floras (Gamble, 1957; Madhava *et al.*, 2013). The herbarium was prepared according to the method of Jain and Rao (1977) and deposited in the Department of Botany, Sri Venkateswara University, Tirupati, Andhra Pradesh for further use. The voucher specimen was authenticated by Prof.N.Yasodamma, Plant taxonomist, SV University,Tirupati.

## Research Article

### Phytochemical Analysis

Fruits (500gms) collected was shade dried and made into coarse powder and made into extract. The aqueous extract was prepared by cold maceration technique. Then the extracts were collected, concentrated using rotary vacuum evaporator. The extracts were filtered using Whatmann filtered paper no. 42 (125 mm) (Sigma-Aldrich). The Aqueous fruit extract was subjected to different chemical tests for the detection of different phytoconstituents using standard procedures (Harborne, 1973; Ibrahim and Towers, 1960; Daschowdary *et al.*, 1967; Markham, 1982; Gibbs, 1974; Edeoga *et al.*, 2005). Terpenoids by Libermann-Burchard test and steroids by Salkowski test. Coumarin test, Tannin test, Flavonoids test, Proteins test (Millions test), Carbohydrate test (Molish test), Test for glycosides, Phytosterol test, Anthocyanidin test, test for amino acids were done.



Figure A: Habit



Figure B: Fruiting stage

## RESULTS AND DISCUSSION

Table 1: Preliminary qualitative phytochemical analysis

Name of the test	<i>Dregea volubilis</i>
Alkaloids	+
Terpenoids	+
Steroids	+
Coumarins	+
Tannins	+
Flavonoids	+
Proteins	+
Carbohydrates	+
Glycosides	+
Phytosterol	+
Lipids	+
Anthocyanidins	+
Amino acids	+
+ Present; - Absent	

### Phytochemical Analysis

The aqueous fruit extract of *Dregea volubilis* were subjected to various qualitative tests for the identification of phytochemical constituents are tabulated in Table-1-6.

Preliminary phytochemical screening of the Fruit aqueous extract of *Dregea volubilis* revealed the presence of major bioactive compounds which may retain a wide range of pharmaceutical and

therapeutical action The fruits of *Dregea volubilis* contain majority of metabolites except saponins, quinines, anthroquinones. Alkaloids, Terpenoids, Steroids, Coumarins, Tannins, Flavonoids, Proteins, Phenolic compounds, Carbohydrates, Glycosides, Starch, Phytosterol, Lipids, Anthocyanidins, Amino acids and Lignins are known to be of therapeutic importance since they have biological roles (Jonsen *et al.*, 1987). In Table-4 shows presence of phenolic compounds in *Dregea volubilis*.

**Table 2: Qualitative analysis of anthocyanidins detected**

Compound	<i>Dregea volubilis</i>
Delphinidin	+
Petunidin	-
Malvidin	-
Peonidin	+

+ *Present*; - *Absent*

**Table 3: Qualitative analysis of flavonoid compounds detected**

Compound	<i>Dregea volubilis</i>
Rutin	+
Myricetin	-
Quercetin	+
Kaempferol	-
Luteolin	+
Apigenin	+
Orientin	+
Vitexin	+

+ *Present*; - *Absent*

**Table 4: Qualitative analysis of phenolic compounds detected**

Compound	<i>Dregea volubilis</i>
Caffeic acid	+
Protocatechuic acid	+
Chlorogenic acid	+
Iso-Chlorogenic acid	+
homo-Protocatechuic acid	+
Gentisic acid	+
$\alpha$ -Resorcylic acid	-
$\beta$ -Resorcylic acid	+
cis-p-Coumaric acid	+
trans-p-Coumaric acid	-
p-Hydroxybenzoic acid	+
Phloretic acid	+
cis-Ferulic acid	-
Scopoletin	+
Aesculetin	+
cis-Sinapic acid	-
trans-Sinapic acid	+
Vanillic acid	+
Syringic acid	+
Coumarin	+
Salicylic acid	+
Cinnamic acid	+

+ *Present*; - *Absent*

**Table 5: Qualitative analysis of amino acids detected**

Compound	<i>Dregea volubilis</i>
Aspartic acid	+
Arginine	+
Asparagine	-
$\alpha$ -Alanine	+
$\beta$ -Alanine	+
2-Amino butyric acid	+
Cysteine	-
Cystine	-
Glutamic acid	+
Glutamine	+
Glycine	-
Histidine	+
Isoleucine	+
Leucine	+
Lysine	+
$\gamma$ -Methylene glutamic acid	-
$\gamma$ -Methylene glutamine	-
Ornithine	+
Phenylalanine	+
Proline	+
Serine	+
Threonine	+
Tyrosine	+
Valine	+

+ *Present*; - *Absent*

**Table 6: Quantitative analysis of lipids detected**

Compound	<i>Dregea volubilis</i>
Phosphatidic acid	-
Phosphatidyl serine	+
Phosphatidyl inositol	+
Phosphatidyl choline	+
Phosphatidyl ethanolamine	+
Digalactosyl diglyceride	+
Phosphatidyl glycerol	+
Unidentified galactolipid	+
Sulphoquinovosyl diglyceride	+
Diphosphatidyl glycerol	+
Steryl glucoside	+
Monogalactosyl diglyceride	+
Steryl glycoside	+

+ *Present*; - *Absent*

### Conclusion

In the present paper, we aim to achieve a study referring to the qualitative and quantitative chemical composition of fruits of *Dregea volubilis*. The fruit contains different secondary metabolites viz., Anthocyanidins (Delphinidin, Petunidin), Flavonoids (Rutin, Myricetin, Quercetin, Luteolin, Apigenin,

Orientin, unidentified flavonoid), Phenolic compounds (iso-chlorogenic acid, caffeic acid, Gentisic acid,  $\beta$ -Resorcylic acid, cis-p-coumaric acid, vanillic acid, cinnamic acid. Results of phytochemical evaluation revealed the presence of alkaloids, Terpenoids, Steroids, Coumarins, Tannins, Proteins, Phenolic compounds, Carbohydrates, Glycosides, Starch, Phytosterol, Lipids, Aminoacids, Lignins. This could be the crucial step in further studies on the phytochemical, biological structure function relationship of the study plant which is already reported to be of therapeutic importance. This established a significant scope to develop a broad spectrum use of *Dregea volubilis* in herbal medicine and as a base for the development of novel potent drug and phytomedicine.

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