

**REVIEW ARTICLE ON "MEDICINAL USES OF DREGIA VOLUBILIS"****Kanhopatra Bhagwat Suryawanshi\* and Dr. Rajesh Mandade**

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**ABSTRACT**

The present work aims to study the Medicinal uses of Dregia Volubilis plant and its pharmacological activity. The plant material we're collected and clean and then dried at room temperature. The dried raw material grinded and form a porous powder. Powder material of Dregia volubilis plant were subjected to various physico-chemical tests such as ash value, water soluble ash, acid insoluble ash and loss on drying. In this work study different activities like antimalarial, antioxidant, antidiabetic, Antiasthmatic, anti-cancer, antitubercular activity of Drwgea volubilis. Dregia volubilis is a woody climbing plant and found in hills, hotter parts of India. The leaves of this plants are edible and use as a green vegetable. The plant extract used traditionally to treat several diseases. The Ethanolic extract we're

prepared from fresh leaves of D.volubilis by hot continuous percolation method in soxhlet apparatus. Ethanolic extract of Dregia volubilis were tested for antimicrobial efficacy against Gram positive, Gram negative and fungal organisms.

**KEYWORDS:** Dregia volubilis, Ethanol extract, Medicine, pharmacology.

**INTRODUCTION**

In modern medicine raw materials of different plants shows important role. They control chronic as well as infectious diseases. Several of these plants derived compounds shows different biological and Pharmacological and other medicinal properties. Plant raw materials also increase therapeutical aa well as Industrial applications.<sup>[1]</sup> In recent years, the chemical importance of the herbal drugs has received considerable attention as many synthetic antioxidants have been shown to have one or the other side effects.<sup>[2]</sup>

The ethanolic extracts of *Dregea volubilis* have motivated to isolate Anti-diabetic responsible compounds from the leaves of *Dregea volubilis* for the management hypoglycemic and Hypolipidemic activities.<sup>[3]</sup> *D. Volubilis* is traditionally used to treat inflammation, boil, abscesses, dyspepsia, piles, asthma, tumours, leucoderma, anthelmintic, paralysis, rheumatism, tonsils, neck pain etc.<sup>[4]</sup>

plant lectins are a unique heterogeneous group of Glycoproteins classified on the basis of their ability to recognize and specially bind the carbohydrates ligands. This most significant property of lectin, to bind with the specific carbohydrate residues, now a day is being utilized in lectin mediated drug delivery system (Michael, 1998).<sup>[5]</sup> Plant used in traditional system of medicine of pharmaceutical houses is 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).<sup>[6]</sup> *Dregea volubilis* belongs (Linn.) belongs to the family Asclepiadaceae which is widely used in Indian traditional medicines and the leaf paste is used to treat rheumatic pain, cough, fever and severe cold.<sup>[7]</sup> Herbal products with proven potential as insecticides and repellent can play an important role in interruption of the transmission of vector borne diseases. In Ayurveda, *D. Volubilis* is extensively used to treat Inflammation, urinary discharge, piles, leucoderma, asthma. Methanolic extract of *Dregea volubilis* leaves also possess anti-inflammatory activity.<sup>[9]</sup>

Inflammation generally occurs in response to tissue injury and is associated with the release of different Mediators like bradykinin, nitric oxide (NO), Vasoactive amines (histamine, serotonin, adenosine), interleukin 1(IL-1), tumor necrosis factor alpha and eicosanoids (prostaglandins, thromboxans, leukotrienes, lipoxins).<sup>[10]</sup> Antioxidants are provided to living organisms to protect them from damage caused by uncontrolled production of reactive oxygen species (ROS) and the concomitant lipid peroxidation, protein damage, and DNA-strand breaking. Current interest is focused on the potential role of antioxidants and antioxidant enzymes in the treatment and prevention of atherosclerosis, heart failure, neurodegenerative disorders, aging, cancer, diabetes Mellitus and several other diseases.<sup>[11]</sup> South East Asia, the plant is used in folk medicine as an Antifebrile and emetic.

The isolation and structure elucidation of three new pregnane glycosides, volubilosides A-C, and the identification of conduritol, quercetin and quercetin-3-O-rutinoside from the methanolic extract of its flowers.<sup>[15]</sup> *Dregea volubilis* belongs to the family Asclepiadaceae,

is a tall Woody climber, with densely lenticellate and pustular branches, leaves opposite, broadly ovate or Suborbicular, cordate, acuminate, flowers bright yellowish-green, in lateral drooping, umbellate, cymes, follicle usually 2, lanceolate covered with brown, mealy, tomentum, turgid, c. 2cm long ; seeds yellowish brown broadly ovate or broad elliptic, winged, comose.<sup>[1]</sup>

### Synonyms

1. <i>Asclepias volubilis</i>
2. <i>Marsdenia volubilis</i>
3. <i>Schollia volubilis</i>
4. <i>Wattakaka volubilis</i>

### Taxonomical Or Botanical classification

Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Gentianales
Family	Asclepiadaceae, Apocynaceae
Genus	<i>Dregea</i>
Species	<i>Volubilis</i>

### Vernacular Classification

English	Cotton milk plant, Green milkweed climber, Common coxcomb, Crested coxcomb, Feather coxcomb.
Telugu	Dooddeepalla, Dudipala, Palakura, Palatige.
Hindi	Murder bel, Nakechhikni.
Sanskrit	Hemajivanti, Hemakshiri, Hemalata, Hemapurna, Hemavali, Hemavati.
Malayalam	Wattakakacodi, Vattakkakkakkoti.
Marathi	Harandodi, Nakhsikani, Harinvel.
Bengali	Jukti
Gujrathi	Hirandodo, Kadavi dodi.



Fig. - *Dregea Volubilis* plant



Fig. - *Dregea Volubilis* leaves



**Fig. - Dregea Volubilis fruit.**



**Fig. - Dregea Volubilis flowers.**



**Fig. - Dregea Volubilis root.**

## **MATERIALS AND METHODS**

### **1. Plant Materials**

Whole fresh plant leaves of *Dregea volubilis* (Linn.) were collected from kalakatu, Tirunelveli District, India. Taxonomical identification was made from botanical survey of medicinal plants, Siddha Unit, Government of India, Palayamkotti. The whole plant leaves were dried under shade, segregated, Pulvarized by a mechanical grinder and passed through a 40 mesh sieve.<sup>[2]</sup>

### **2. Preparation of Extract**

The above powdered materials (1kg) were successively extracted with petroleum ether (40-60°C), ethyl acetate (40-60°C) and ethanol (70-80°C) for 48 hrs by continuous hot percolation method in soxhlet apparatus.<sup>[8]</sup> The extract was collected and evaporated to dryness by using a vaccum distillation unit. The dried extracts were stored in airtight container.

### Chemical Constituents

Ethanol extract of *Dregea Volubilis* (Linn.) in which some chemical components are identified like 1,3-Diazacyclooctane-2-thione, 2-Undecanol, Vitamin d3, 1,3-Propanediol, 2-ethyl-2-(hydroxymethyl), Myo-Inositol, 4-C-methyl, Hexadecanoic-3-hydroxy-propanoic acid, Lactose, L-Glucose, Linoleic acid, Trimethylsilyl ester, Photos, Undecanal, 2-methyl, Hexadecanal, 2-methyl, Phen-1,4,-diol, 2,3-dimethyl-5-trifluoromethyl, Oxirane, (hexadecyloxy) methyl.<sup>[7]</sup> *Dregea Volubilis* (Linn.) Benth also contains some other phytochemicals such as Alkaloids, Terpenoids, Steroids, Coumarins, Tannins, Flavonoids, Proteins, Carbohydrates, Glycosides, Phytosterol, Anthocyanidins, Amino acids, Phenolic compounds Lipids and certain unidentified compounds.<sup>[6]</sup>

### Morphological characteristics of *Dregea Volubilis*

*Dregea volubilis* is a woody climbing plant commonly found in the hotter parts of India. The leaves are edible and used as a green vegetable.<sup>[14]</sup> *Dregea Volubilis* Benth is commonly known as "Jukti" in Bengal. It is a tall woody climber. The height of the climber is 11 m and 95 cm girth. The branches of this climber are densely lenticular and pustular.<sup>[11]</sup>

**1. Leaves** - *Dregea Volubilis* leaves are opposite, broadly ovate or suborbiculate.<sup>[1]</sup> Leaves are cordate and acuminate.

**2. Flowers** - Flowers are bright yellowish-green in colour. They are in lateral drooping, umbellate, cymes, follicle usually 2, lanceolate covered with brown, mealy, tomentum, turgid. The flowers are 2 cm long.<sup>[1]</sup>

**3. Seeds** - Seeds are yellowish brown in colour. These are broadly ovate or broad in shape and also elloptic, winged, comose.<sup>[1]</sup>

### Pharmacological activities of *Dregea Volubilis*

#### 1. Anti-diabetic activity and Antihyperlipidemic activity

*Dregea Volubilis* ethanol extract is used to treat anti-diabetics. The fractionation and isolation of compounds from pharmacologically active ethanol extract is used in anti-diabetic activity. The structure of the compound had been attempted to be set up through spectroscopic techniques. Various isolation fractions of ETV (100mg/kg) were evaluated for their anti-diabetic effect in fed with high energy diet of 20% sucrose and 10% lard. A try was made to isolate the purified compounds responsible for anti-diabetic response the use of column chromatography method with ETV. The fraction F from ETV showed high anti-diabetic interest on a par with the standard drug metformin.<sup>[3]</sup>

Benth leaves on serum glucose and lipid profile in normal and diabetic rats. Diabetes was induced by streptozotocin in wistar rats. Petroleum ether, ethyl acetate, and ethanol extracts of *Dregea volubilis* [Linn.] Benth leaves were administered orally at a dose of 200 mg/kg, p.o. Metformin was used as standard Anti-diabetic drug (50 mg/kg, p.o). The extract showing for higher Anti-diabetic activity was subjected to column chromatography that led to isolation of an active fraction, which was given trivial name Dv-1. Dv-1 (100 mg/kg, p.o.) was studied for its hypoglycemic and hypolipidemic potential.

### **Alpha-Glucosidase inhibitory activity**

Many scientific studies have reported that vegetables and herbal extracts have the capability to inhibit activity of Alpha-glucosidase leading to control of blood glucose levels which suggests that food resources can be utilized as dietary anti-diabetic agents for controlling postprandial hyperglycemia (Yu et al., 2015; Wojdylo et al., 2016).<sup>[4]</sup>

### **Alpha-Amylase inhibitory activity**

Plant phenolics have ability to bind with the reactive site of Alpha-Amylase and hence exhibit hyperglycemia effect (Kunyanga et al., 2012). The inhibitors of Alpha-Amylase retard breakdown and digestion of starch and other complex carbohydrates present in diet in gastrointestinal tract and therefore make them useful in dietary management of type 2 diabetes.<sup>[4]</sup>

## **2. Anti-leishmanial activity**

In vitro anti-leishmanial activity against *Leishmania donovani* (strain AG83) have been shown from the isolated compound in the petroleum ether extract of *Dregea Volubilis* fruits. The active fraction of the extract of *Dregea Volubilis* fruits and identified as a pentacyclic triterpenoid compound, namely taraxerone. The taraxerone inhibited growth of *Leishmania* promastigotes and shows anti-leishmanial activity.<sup>[12]</sup>

## **3. Anti-tumour activity**

The human chronic myelogenous leukemia cell line K562 was obtained from a patient in blast crisis of chronic myeloid leukemia. The anti-tumour activity on K562 leukemia cell line have been shown the isolation compound in the petroleum ether extract of *Dregea Volubilis* fruits. As the dose of the drug increased, the proportion of cells lysed dose from 38 to 87%.<sup>[12]</sup>

#### 4. Antioxidant activity

Antioxidant form an intense blue coloured ferrous tripyridyltriazine complex through ferric to ferrous ion reduction of ferric tripyridyltriazine complex (Shen et al. 2016 ) the high values of total phenolic and flavonoids present in DVHA (hydrochloric flower extract of *D. Volubilis*) are responsible for the antioxidant activity of flowers of *Dregea Volubilis*.<sup>[4]</sup>

#### Hydroxyl radical scavenging activity

Hydroxyl radical is a highly reactive free radical formed in biological system in a state of oxidative stress. The free radical is responsible for the pathogenesis of various chronic diseases. The capability of DVHA to scavenge hydroxyl radical is associated with its antioxidant activity.<sup>[4]</sup>

#### Superoxide radical scavenging activity

Superoxide radical is a ROS which is known to be harmful to cellular components and DNA leading to diverse ailments (Shukla et al. 2009). A number of methods are now available for the generation of superoxide radical and thus superoxide radical scavenging activity of antioxidant are evaluated.<sup>[4]</sup>

#### 5. Anti-inflammatory activity

Herbal products have potential as insecticides and repellent can play an important role in interruption of the transformation of vector borne diseases. Methanolic extract of the leaves also possess anti-inflammatory activity. *D. Volubilis* extensively used to treat inflammation as well as antifungal activities against ringworm causing fungal.<sup>[9]</sup>

#### 6. Anti-microbial Activity

The anti-microbial activity was performed by the disc diffusion method. Agar plate prepared and the test of micro-organism incubated by spread plate method. Agar plate was incubated at temperature 37°C. And after 16-18 hrs of the process of incubation each plate was examined. Finally the zone of inhibition was observed the shows zone of uniformly Cercular with a confluent lawn of growth.

#### 7. Anti-asthmatic Activity

Aerial part of *Dregea volubilis* has been documented as an effective medicinal plant for the management of asthma in traditional medicine. The results of the present study provide

evidence that methanolic extract of *Dregea volubilis* can be used as an anti-asthmatic and expectorant herbal medicine.<sup>[17]</sup>

## CONCLUSION

This study has revealed that DVHA of the flower of *D. volubilis* exerts promising antioxidant potential towards different systems *in vitro* and  $\alpha$ -glucosidase and  $\alpha$ -amylase inhibiting activities *in vitro*. The flower of the plant is therefore recognized as powerful antioxidant as well as carbohydrate hydrolyzing enzymes inhibitor which is helpful in the field of nutrition and medicine. Reduction in the FBG, cholesterol, triglyceride levels and improvement in the HDL by Dv-1 indicates that Dv-1 has Anti-diabetic activity along with anti hyperlipidemic efficacy and provides a scientific rationale for the use as an Anti-diabetic agent.

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