

# PHYTOCHEMICAL AND HISTOCHEMICAL SCREENING OF *Dodonaea viscosa* LEAVES

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## **Abstract**

*In the present study to investigate the phytochemical and histochemical screening of *Dodonaea viscosa* leaves. The phytochemical screening of *Dodonaea viscosa* leaves showed that the presence of saponins, flavonoids, steroids, terpenoids, triterpenoids, alkaloids, anthraquinones, polyphenol, glycosides and coumarins were absent in ethanolic extract. Aqueous extract of *Dodonaea viscosa* leaves showed the presence of tannins, saponins, flavonoids, steroids, terpenoids, triterpenoids, alkaloids, anthraquinones, polyphenol, glycosides and coumarins. Quantitative analysis revealed that the *Dodonaea viscosa* leaves have flavonoids, saponin and phenol. Significant amount of flavonoids (32.21mg/gm), Saponin (29.08 mg/gm) and phenol (127.90mg/gm) were presented. Histochemical analysis confirmed the presence of phytochemicals in *Dodonaea viscosa* leaves. The rich phytochemicals possess potential pharmacological activity including antidiabetic, antiulcer and cancer.*

**Keywords:** *Dodonaea viscosa* leaves, Phytochemical, Histochemical

## **INTRODUCTION**

Phytochemicals (from the Greek word phyto, which suggests plant) are biologically active, present chemical compounds found in plants, that provide health benefits for humans more than those attributed to macronutrients and micronutrients (Hasler and Blumberg, 1999). They defend plants from unwellness and injury and contribute to the plant's color, aroma and flavor. In general, the plant chemicals that defend plant cells from environmental hazards like pollution, stress, drought, ultraviolet radiation exposure and infective attack are known as phytochemicals (Mathai, 2000). More than 4,000 phytochemicals are cataloged and are classified by protecting function, physical characteristics and chemical characteristics (Meagher and Thomson, 1999). Plant-derived substances have recently become of great interest owing to their versatile applications. Medicinal plants are the richest bio-resource of medicine of traditional systems of drugs, trendy medicines, nutraceuticals, food supplements, folk medicines, pharmaceutical intermediates and chemical entities for artificial medicine.

Medicinal plants are the nature's gift to us to create unwellness free healthy life. It plays a significant role to preserve our health. Republic of India is one in every of the foremost medico culturally various countries within the world wherever the healthful plant sector is a component of a time honored tradition that's revered even these days. Traditional medicines

derive their scientific heritage from wealthy experiences of ancient civilization. Hence, it's not shocking that ancient medicines claim comes for many "difficult to cure" diseases. (Satyavati, 1982). India is documented for its wealthy ancient systems of drugs i.e. Siddha, Ayurveda, Unani and Amchi (Tibetan) besides a colossal reservoir of living traditions in ethnomedicine. The earliest mention of the utilization of plants in drugs is found within the Rigveda that was written between 4500 and 1600 B.C. During British period due to Western culture, our traditional art of natural healing is disappeared. Now it is reappearing due to realization of its importance in curing diseases without any side effects. To investigate the qualitative, quantitative and histochemical analysis of phytochemicals in *Dodonaea viscosa* leaves extract.

## MATERIALS AND METHODS

### Collection of plant materials

The leaves powder of *Dodonaea viscosa* were purchased in December 2018 from siddha medicinal shop, Thanjavur, Thanjavur district, Tamil Nadu, India.

### Preparation of plant extract:

1 gram of the powder of *Dodonaea viscosa* leaves were transferred in to different conical flask (250ml). The conical flask containing 50ml of different solution (ethanol and water). The conical flask containing *Dodonaea viscosa leaves* were shake it well for 30 minutes by free hand. After 24 hrs, the extracts were filtered using whatman filter paper No.1 and filtrate used for further analysis.

### Phytochemical screening

Phytochemicals were analyzed in the plant extract followed by Sofowara, (1993), Trease and Evans (1989) and Harborne (1973) methods

### Quantitative analysis of phytochemicals

Total phenols estimated by the method of Edeoga *et al.*, (2005). Flavonoid assayed by the technique of Bohm and Kocipai-Abyazan (1994) Saponin determine by the method of Obadoni and Ochuko (2001).

### Histochemical tests: (John Peter Paul, 2014; Gersbach *et al.*, 2001).

The *Dodonaea viscosa leaves* powder were treated with specific chemicals and reagents. The treated plant powder further analysed in light microscope. The *Dodonaea viscosa leaves* powder treated with diluted ammonia and H<sub>2</sub>SO<sub>4</sub> gave yellow colour indicates Flavonoids, treated with FeCl<sub>3</sub> reagent gave dark blue to black colour indicates Tannin, treated with Few drops toluidine blue reagent gave Blue green / red colour indicates Polyphenol, treated with Few drops Con. H<sub>2</sub>SO<sub>4</sub> reagent gave Yellow colour indicates Saponins and treated with acetic anhydride + Con. H<sub>2</sub>SO<sub>4</sub> (1:1 ratio) reagent gave Violet to blue (or) green colour indicates Steroids.

## RESULTS AND DISCUSSION

### Qualitative and quantitative analysis

In the present study was carried out on the *Dodonaea viscosa leaves* revealed the presence of medicinally active constituents. The phytochemical characters of the *Dodonaea viscosa leaves* investigated and summarized in Table-1 and figure 3 and 4. The phytochemical screening *Dodonaea viscosa leaves* showed that the presence of saponins, flavonoids, steroids, terpenoids, triterpenoids, alkaloids, anthroquinones, polyphenol, glycosides and coumarins were tannins was absent in ethanolic extract.

*Dodonaea viscosa leaves* showed that aqueous extract present in tannins, saponins, flavonoids, steroids, terpenoids, triterpenoids, alkaloids, anthroquinones, polyphenol, glycosides and coumarins

Hassain *et al.* (2011) screened phytochemical constituents from methanol leaf extract of *Bombax malabaricum*. Various organic 11 solvent extracts of *Pedaliium murex* were subjected to preliminary phytochemical screenings by Thamizh mozhi *et al.* (2011). Selected 53 traditionally used medicinal plants from western region of India for their qualitative phytochemical screenings, total phenol and flavonoids contents. Pascaline *et al.* (2011) screened phytochemical constituents of some medicinal plants used by the Nandis of South Nandi District, Kenya.

Kumar *et al.*, (2013) investigated the preliminary phytochemical screening of the leaves of the plant *Lasia spinosa* (Lour) Thwaites. The phytochemical screening showed that the methanol and aqueous extracts contained alkaloid, the carbohydrates and the phenolic compounds were present in all of the solvent extract except petroleum ether extract. The chloroform, ethyl acetate and the aqueous extract contained glycosides whereas the saponins present in methanol and aqueous extract. The ethyl acetate extract contain only the flavonoids.

**Table 1: Qualitative analysis of Phytochemicals in *Dodonaea viscosa leaves***

S. No	Phytochemicals	Leaves extract	
		Ethanolic	Aqueous
1	Tannin	-	+
2	Saponin	+	++
3	Flavonoids	+	+
4	Steroids	+	+
5	Terpenoids	+	+
6	Triterpenoids	+	+
7	Alkaloids	+	+
8	Antroquinone	+	+
9	Polyphenol	+	+
10	Glycoside	+	+
11	Coumarins	+	++

(+) Indicates Presence; (++) moderately present

### Quantitative analysis

Quantitative analysis revealed that the *Dodonaea viscosa leaves* has flavonoids, saponin, and phenol. Significant amount of flavonoids (32.21mg/gm), Saponin (29.08 mg/gm) and phenol (127.90mg/gm) were presented (Table 2).

**Table 2: Quantitative phytochemical analysis of *Dodonaea viscosa leaves***

S. No	Phytochemicals	Results (mg/gm)
1	Saponin	29.08 ± 2.03
2	Flavonoids	32.21 ± 2.25
3	Phenol	127.90 ± 8.95

Values are expressed as mean ± SD for triplicates

Leo Stanley *et al.* (2011) reported that leaves of *C. pedata* showed the presence of alkaloids, carbohydrates, steroids, tannin, phenolic compounds, flavonoids and terpenoids. Dinesh kumar *et al.* (2011) has been reported to terpenoids, flavonoids and tannin are present in *C. trifolia*. Rajmohanam *et al.* (2014) investigated the preliminary phytochemical analysis of various extracts of leaves of *C. pedata* and showed the presence of carbohydrates, flavonoids, tannins and phenolic compounds and terpenes.

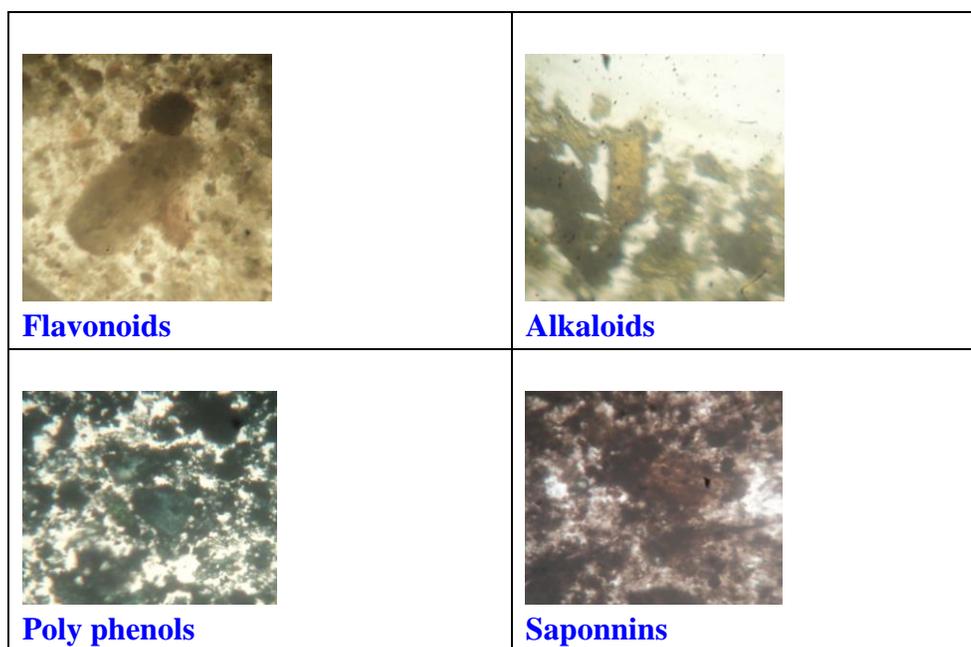
### Histochemical analysis of leaves powder of *Dodonaea viscosa leaves*

Histochemistry is the branch of histology dealing with the identification of chemical components of cells and tissues, it is a powerful tool for localization of trace quantities of substances present in biological tissues. Histochemical analysis have been working to describe assembly and development, and to study time course of deposition and distribution of major phytochemicals (Krishnan *et al.*, 2001). In the present study, *Dodonaea viscosa leaves* were treated with specific chemicals and reagents. The *Dodonaea viscosa leaves* powder treated with diluted ammonia and H<sub>2</sub>SO<sub>4</sub> gave yellow colour indicates Flavonoids, treated with FeCl<sub>3</sub> reagent gave dark blue to black colour indicates Tannin, treated with Few drops toluidine blue reagent gave Blue green / red colour indicates Polyphenol, treated with Few drops Con. H<sub>2</sub>SO<sub>4</sub> reagent gave Yellow colour indicates Saponins and treated with acetic anhydride + Con. H<sub>2</sub>SO<sub>4</sub> (1:1 ratio) reagent gave Violet to blue (or) green colour indicates Steroids. (Table 3 and figure 5). This results further confirmed the presence of phytochemicals.

**Table.3: Histochemical analysis of leaves powder of *Dodonaea viscosa***

S. No	Phytochemicals	Results
1	Alkaloids	+
2	Saponin	+
3	Flavonoids	++
4	Polyphenol	++

Note: (+) Presence; (++) present with high intensity of the colour

**Fig.5: Histochemical analysis of leaves powder of *Dodonaea viscosa***

## CONCLUSION

The phytochemical screening *Dodonaea viscosa* leaves showed that the presence of saponins, flavonoids, steroids, terpenoids, triterpenoids, alkaloids, anthroquinones, polyphenol, glycosides and coumarins were tannins was absent in ethanolic extract. Aqueous extract of

*Dodonaea viscosa* leaves showed the presence of tannins, saponins, flavonoids, steroids, terpenoids, triterpenoids, alkaloids, anthroquinones, polyphenol, glycosides and coumarins. Quantitative analysis revealed that the *Dodonaea viscosa leaves* has flavonoids, saponin and phenol. Significant amount of flavonoids (32.21mg/gm), Saponin (29.08 mg/gm) and phenol (127.90mg/gm) were presented. Histochemical analysis confirmed the presence of phytochemicals in *Dodonaea viscosa* leaves. The rich phytochemicals possess potential pharmacological activity including antidiabetic, antiulcer and cancer.

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