

Preliminary Phytochemical Analysis And Antioxidant, Anti-Inflammatory Activity Of *Dicliptera Ghatica Santapau*

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Abstract: *Dicliptera ghatica santapau*, is a very rare plant from the Acanthaceae family. The plant has excellent healing properties and can be used to treat a variety of illnesses and diseases. In Ayurveda, the plant and its part have quite important. In this study, we have used the flower and leaves of the plant were used for phytochemical analysis and biological features such as antioxidant as well as anti-inflammatory activities. The phytochemical analysis followed a well-established protocol, whereas antioxidant as well as anti-inflammatory activity was assessed using well-established methodologies. *Dicliptera ghatica santapau* plants, leaves and the flowers extract include a variety of active constituents and have improved antioxidant and anti-inflammatory properties.

Keywords: *Antioxidant, Dicliptera ghatica santapau, DPPH, Anti-inflammatory*

1. INTRODUCTION:

Plants have been the base of traditional medicines from ancient time throughout the world and continue to provide innovative goals for remedies for several afflictions of mankind [1]. In last few decades have seen substantial variation in opinion concerning ethnopharmacological therapeutic applications of phytochemicals. A great deal of effort therefore still focuses on identifying and using these phytochemicals as source of new therapeutic molecules. Today's pollution is increasing at a rapid rate. A huge number of free radicals are produced as a result of pollution. Animals are exposed to these free radicals or oxidizing agents, which have a significant impact on their metabolism and the endogenous ones created by metabolism [2], [3]. Most chemical entities, like superoxide anion (O₂⁻), nitric oxide (NO•) oxygen species (ROS), hydroxyl (HO•), and peroxy (ROO•) radicals, or nitric oxide (NO) reactive nitrogen species (RNS), peroxy nitrite anion, contain reactive radicals. (ONOO⁻) which include agents like and hypochlorous acid (HClO) hydrogen peroxide (HOOH) [4], [5]. The majority of these free radicals, such as ROS and RNS, protein crosslinking, DNA damage and induce lipid peroxidation resulting in atherosclerosis, chronic inflammation, diabetes, cardiovascular disorders, malignancies, liver, and neurological illnesses [6]. Antioxidants are employed in the food business to extend the shelf life of foods, particularly those that cause polyunsaturated fats to peroxide due to lipid peroxidation.

Therefore, food deterioration, discolouration, and nutritional losses among other things rise. Various synthetic antioxidants are available such as butylated hydroxyanisole, tertiary butylhydroquinone, butylated hydroxytoluene (BHT), and propyl-gallate. Inflammation is caused by tissue that has anti-inflammatory activity in response to injury. This is an example of the complicated process of inflammation, which is frequently linked to pain and includes events like increased vascular permeability, increased protein denaturation as well as membrane modification [7]. It consists of a series of fluidic and cellular changes. The generation of different radicals such as O_2 , OH , and non-free radical species (H_2O_2) leads to an over activation of phagocytes, which has anti-inflammatory properties. These are extremely potent oxidizing agents. As a result, medicines that can scavenge reactive oxygen species may be useful in the dealing of both oxidative illnesses and inflammatory.

Dicliptera ghatika santapau is a very rare plant from the *Acanthaceae* family [8]. This plants with leaves are simple and decussated leaves with whole (or occasionally serrated, lobed, or spiny) margins and no stipules. Calyx is normally four or five lobed, with a tubular, two-lipped, or five-lobed corolla; stamens are two or four, grouped in pairs and inserted on the corolla. The fruit is a two-celled capsule that explodes as it decomposes [9]. When the fruits dehisce, retinacula propel seeds away from the parent plant, allowing the plant to achieve maximum seed dispersal range, according to a 1995 study of seed ejection in *Acanthaceae*. This plant has beneficial biological properties, namely in the treatment of tumours, asthma, edoema, and as a detoxicant. In these countries, it is edible. The juice of this plant is frequently drunk, and it is often combined with honey in ayurvedic preparations [8]. This plant contains anticancer properties and is used to treat malignancies such as cervical cancer, breast cancer, and leukaemia. Furthermore, the plant has been utilized to treat respiratory ailments, including cough and asthma. Breast abscess, hemangioma, spleen lymph tumour, and wounds have all been treated with it.



Fig.1 *Dicliptera ghatika santapau* Plant

2. MATERIALS AND METHODS

Plant materials and Preparation of Extract

The flower and leaves of *Dicliptera ghatika santapau* were collected from Lonavala region of Maharashtra, India. The obtained flower and leaves, washed with deionized water then dried at for two weeks. The dried samples were powdered using pestle and mortar. Powdered plant

samples were separately dissolved in 300 ml of methanol for 30 h while frequently shaking. Mixture was filtrated with Whatman No. 1. The obtained filtrate was used for the phytochemical analysis. The leaves and flower extract of *Dicliptera ghatika santapau* plants were named DGS-L and DGS-F respectively.

Phytochemical Analysis

Phytochemical screening of DGS-L and DGS-F carried using Trease and Evans method. Phytochemistry of leaves Powder was Carried out as Following

Table 1: Qualitative analysis of phytochemicals of DGS-F and DGS-L

Constituents	Name of test	DGS-F	DGS-L
Sterol and Triterpenes	Lieberman-Burchard's reaction [10]	+	-
Steroid	Salwoski's test [11]	+	-
Anthraquinone	Borntrager's test [12]	+	+
Saponin	Frothing test [13]	+	-
Flavonoid	Sodium hydroxide test [4]	+	+
Reducing Sugars	Fehling reagent test [14]	+	+
Alkaloid	Wagner's test [15]	+	-
Proteins	Biuret reaction [12]	+	-
Tannins	Ferric chloride test [13], [16]	+	-

+ =positive, - = negative

Antioxidant Activity Determination

DPPH Scavenging Test: The percentage of the antioxidant present in the sample was determined using the typical protocol of the DPPH scavenging test. This test was carried out using the specific protocol. This test was carried out by preparing the various extracts of the plant material [17], [18].

Study of anti-inflammatory activity (In-vitro models)

The anti-inflammatory activity of the different extracts was carried out using a slight modification of Mizushima and Kobayashi protocol with doses. The albumin test method was used [19].

3. RESULTS AND DISCUSSIONS

Phytochemical Analysis

In phytochemical analysis, sterols, triterpenes, steroid, tannins, anthraquinone, saponins, flavonoids, reducing sugars, alkaloids, proteins, coumarins were present in DGS-F, while anthraquinone, flavonoids, reducing sugars were present in DGS-L [20].

Anti-oxidant Study

DPPH Scavenging Assay

The antioxidant activities of the organic solvents of flowers and fruits extract of *Dicliptera ghatika santapau* tabulated in Table 2 and Table 3 for BHT, C₂H₅OH, CHCl₃ and CCl₄ extract. The graphical performance of BHT, C₂H₅OH, CHCl₃ and CCl₄ for DGS-L displayed in Fig. 2. It shown that C₂H₅OH and CHCl₃ have better antioxidants performance than CCl₄. Fig. 3 demonstrated that DPPH radical activity of DGS-F and CHCl₃ and CCl₄ exhibited lower performance than C₂H₅OH extract. We can obtain this antioxidant activity, very effectively from the flowers and leaves of the *Dicliptera ghatika santapau* plant.

Table 2: Antioxidant activity of DGS-L

Extract Conc. Mg/ml	BHT	C ₂ H ₅ OH	CHCl ₃	CCl ₄
0.05	48.1	27.60	26.53	45.40
0.1	49.91	32.54	34.53	43.89
0.2	52.24	40.24	43.50	48.32
0.3	60.57	45.12	53.00	58.60

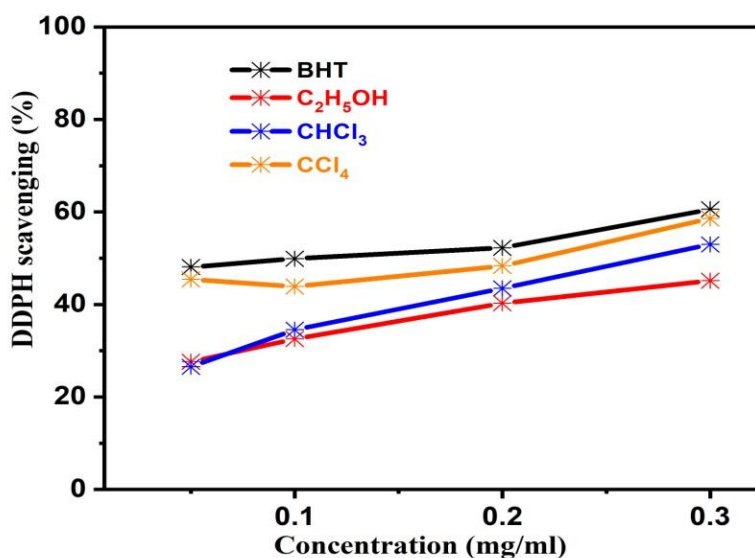


Fig. 2 Antioxidant activity of DGS-L in DPPH radical assay

Table 3: Antioxidant activity of DGS-L

Extract Conc. Mg/ml	BHT	C ₂ H ₅ OH	CHCl ₃	CCl ₄
0.05	48.1	42.34	27.33	34.33
0.1	49.91	44.34	30.34	33.45
0.2	52.24	49.33	36.33	42.45
0.3	60.57	59.56	44.45	48.50

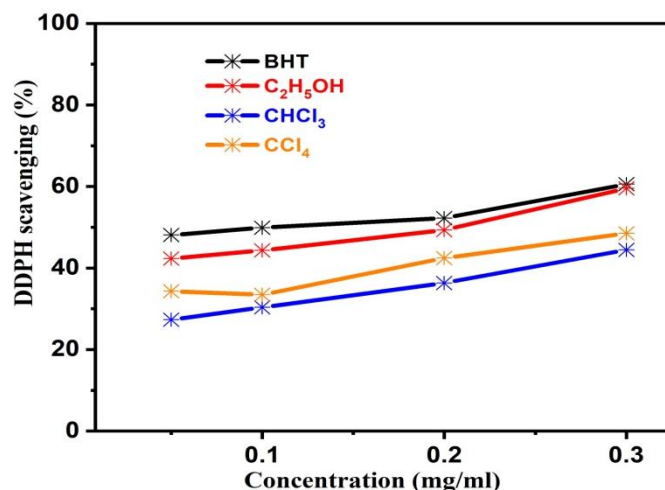


Fig. 3 Antioxidant activity of DGS-F in DPPH radical assay

Determination of Anti-inflammatory Activity

Table 4: Anti-inflammatory activity of DGS-L

In-Vitro Anti – inflammatory activity	Dose (mg / kg)	Absorbance value (Mean + SE)	Inhibition of denaturation (%)
Control	5ml / kg	0.098	----
Standard (Ibuprofen)	100mg/kg	0.18	90.32
Petroleum ether extract	200mg/kg	0.15	67.34
Chloroform extract	200mg/kg	0.14	62.45
Ethyl acetate extract	200mg/kg	0.12	81.56
n-Butanol	200mg/kg	0.16	80.67
Ethanol	200mg/kg	0.17	87.67

Table 4: Anti-inflammatory activity of DGS-F

In-Vitro Anti – inflammatory activity	Dose (mg / kg)	Absorbance value (Mean + SE)	Inhibition of denaturation (%)
Control	5ml / kg	0.098	----
Standard (Ibuprofen)	100mg/kg	0.18	90.32
Petroleum ether extract	200mg/kg	0.12	42.08
Chloroform extract	200mg/kg	0.13	31.77
Ethyl acetate extract	200mg/kg	0.12	42.08
n-Butanol	200mg/kg	0.14	56.71
Ethanol	200mg/kg	0.12	42.08

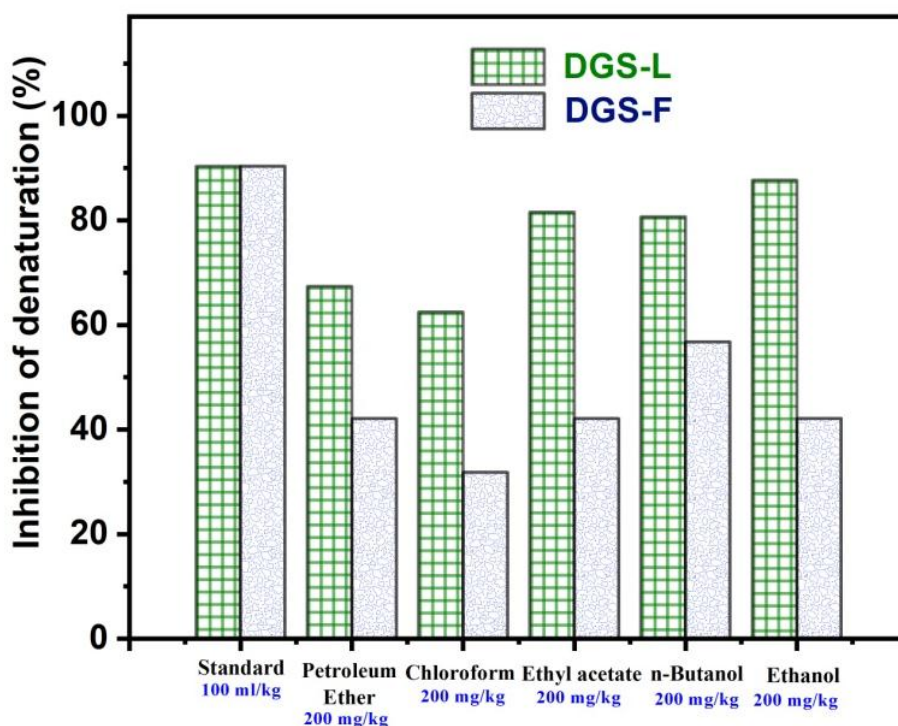


Fig. 4 Anti-inflammatory activity of DGS-L and DGS-F

4. RESULTS AND CONCLUSION:

Based on the present study it can be concluded that in phytochemical analysis, sterols, triterpenes, steroid, tannins, anthraquinone, saponins, flavonoids, reducing sugars, alkaloids, proteins were present in flowers extract, while anthraquinone, flavonoids, reducing sugars were present in leaves extract of *Dicliptera ghatika* santapau. Mostly Ethanolic and chloroform extract of the flower and leaves of *Dicliptera ghatika* santapau possess *in-vitro* anti-inflammatory activity which might be attributed to the presence of various phytochemicals in the extract. Flower and leaves of *Dicliptera ghatika* santapau strong antioxidant activity as evidenced by the free radical scavenging property, can be a very effective antioxidant and can protect against the oxidative stress that is found to be a significant pathophysiological event in a variety of diseases like cancer, diabetes, cardiovascular disorders, and rheumatoid arthritis. This may be due to the presence of phenolic components in the flower and leaves of *Dicliptera ghatika* santapau. Overall, *Dicliptera ghatika* santapau a source of natural antioxidant that can be important in disease prevention and health preservation.

5. CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

6. REFERENCES

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