

Antioxidant activity and phytochemical characterization of leaves and flower of *Ceropegia jaini*

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Abstract

Ceropegia jaini is important medicinal plant occur in the Konkan region of the Maharashtra, India and it is rare plant. This plant was widely used in India it has the good pharmacological property. In this present study our aimed to investigate the various phytochemicals and screening of the antioxidant activity. The phytochemical preliminary screening was carried out indicate that the presence of the phytochemical like saponins, steroids, alkaloids, flavonoids and phenolics. The antioxidant capacity of the plant was studied by using the BHT as the standard for the measurement. The activity was measured by the DPPH method. This 1, 1-diphenyl-2-picryl-hydrazyl, was used as free radical scavenger. It shows good antioxidant activity. Both the leaves and flowers has good antioxidant activity. It shows the strong relationship with the antioxidant capacity of the leaves and flower. The present study shows the leaves and flower good antioxidant activity. It can be used as good source of natural free radical scavenger. This plant used as good antioxidant activity both the leaves and flower shows this activity.

Keywords: *Ceropegia jaini*, free radical scavenging activity, alkaloid, phenolic, plant, flowers

Introduction

The Ayurveda is the back bone in the Asian countries from very long back. The medicines or the various medicines are obtained from the plant material. Some plant material ^[1, 2] can be used as the source or the precursor in the various drug discovery processes ^[3]. These are medicinal plant used by the human from the long back. These traditional medicines act as good source of the drugs. There are many medicinal plants which have very good activity cardiovascular, immunosuppressive, anticancer, 80% of antimicrobial and have the plant origin ^[4, 5, 6]. There is the parameter in which the active intergradient isolated from the plant. Plant phytochemicals are the naturally occurring chemical compounds have good activity. The plant also contains the nutrients, certain dietary fibers which protect plant and animal against the diseases. Plant can follow the different pathways. They are the biosynthetic pathway, synthesizes the various chemicals in the plant on the basis of their pathway and natural conditions as saponins, terpenes, steroids, flavonoids, phenolic, alkaloids etc. In the several decades we have seen these plants have the various therapeutic uses and have effect against the diseases. Many of the phytochemical⁷ have the good antioxidant activity and reduces the risk of many different diseases. It was related with the different activity which is related to antioxidant and oxidative stress. This is cause the various diseases including cancers and cardiovascular diseases. These oxidative stress cardiovascular diseases and the cancers.

In the era of the modern civilization various industrial growths takes place. During this the different free radicals are formed. These free radicals include the hydroxy free radicals, hydrogen peroxide radicals, superoxide radicals, certain singlet radicals such radical generated in the large excess. They can cause the damage to the body's proteins,

lipids and deoxyribonucleic acid. These may ultimately lead to the various diseases like the cancer, various degenerative diseases, several nervous diseases, cardiovascular diseases, liver failure, kidney failure, ischemia, inflammation allergies, diabetes and anemia. There are the certain oxygen species are essential to maintain the various physiological and the biochemical functions having the apoptosis of defective cells and cell signaling. There are certain medicinal plants have to produce the greater number of the secondary metabolites that contain the various physiological and biochemical effect. These secondary metabolites and their derivatives contain the significant effect of pharmacological, diuretic effect, anti-allergic, anticancer effects, anti-hepatotoxic, antioxidant effects. There is the strong antioxidant activity. They have the various phytochemicals such as the tocotrienols, ascorbates, tocopherols, phenols and carotenoids. Presently there is increased interest to look for the plant with good antioxidant activity to develop the good antioxidantizing agent in the pharmaceutical industry. Medicinal plant having the good antioxidant activity, show the protective role against the certain cells. Mostly the compounds obtained from the medicinal plant having the effect such as they prevent the oxidative effect and the harmful effect. In this paper we have used the flowers of the plant *Ceropegia jaini*. This plant has the description as Marathi name *Jaini Kharchudi* it's from family *apocynaceae*. It is a very infrequent, endangered herb and widespread to the Sayhadri hills. It is a small erect herb, 10-30cm high, with tuberous root. Tubers are hairless 2-3cm. slender stem is green with oppositely arranged leaves. Leaves are linear-lance shaped, 2-5cm long, hairy on both sides, limits with stiff hairs. Flowers occur singly in leaf axils. Slender flower-stalks are 6-10 mm long. Sepals are lance-shaped, 3-5mm. Flowers are 2cm long, tube-shaped, with the tube enlarged at the

dishonorable and white. Five fine line petals are 1cm long, reddish-purple, and hairy at the base. Sometimes the flower is wholly purplish-red. Flowering occur in August-October [8, 9]. In this research we have studied the antioxidant activity of the leaves and flowers of the plant *Ceropegia jaini*. we have also carried the phytochemical

Materials and methods

Chemicals and reagents

All chemical used for the analysis were the analytical grade. These were purchased from the S. D. Fine chemicals, Mumbai, MH, India.

Collection of plant materials

Plant material *Ceropegia jaini* flowers were collected in the month of September from the Rajapur region of the Maharashtra India, identified and authenticated by Dr. Arun Chandore, Abasaheb Marathe College, Rajapur, tehsil of Ratnagiri District, Maharashtra, India. The specimen sample kept in the Department of Botany in Abasaheb Marathe College, Rajapur.

Experimental

The leaves and flowers of plant were collected from the Rajapur region. The flowers and leaves are collected are dried in shade for 6 days, after drying of the flowers kept in the oven at 40°C for 6 hours then finally converted into powder. This powder was kept in oven for 3 hours at 50°C. This powder was stored at the room temperature. Phytochemical¹⁰⁻¹¹ testing carried out as per given protocol and then then other biological activity carried using the correct protocol.

Preparation of extract

10 g of the powder was taken in the round bottom flask to this add 100 mL of the water and reflux it for the 6 hrs. Cool filter the extract was obtained and filter. The filtrate was cooled at the room temperature and used for the study. Same protocol used for the methanol and ethanol. The extract was prepared for both the flowers and leaves.

Detection of sterol

Polyterpenes can be detected by the Liebermann reagent, this gives the pink colour formation indicate the presence of the polyterpenes. While formation of blue green colour indicate the presence of steroids. This test is positive for the steroids and the polyterpenes [12].

Detection of reducing sugars

Reducing sugar were identified in the given sample by the Fehling reagent and finally confirmed by the Tollens reagent test.

Red brick colour formation indicates the presence of the reducing sugar. This test is positive for the reducing sugar. This was also confirmed by the silver mirror test.

Detection of Alkaloids

Alkaloids [13, 14] was determined by Bouchardat reagent and (reagent iodobismuthate of potassium). By using Dragendorff reagent formation of Orange colour indicate the presence of the alkaloids. This test is positive for flowers.

Detection of proteins

The proteins [15] were identified the biuret reaction. Formations of purple colour indicate presence of protein. This test positive for the flower powder.

Detection of coumarins

Coumarins are detected by 2 mL ethanolic solution and sodium hydroxide was used. formation of yellow colour indicate the presence of coumarin. this test is negative for the extract [16].

Detection of tannins

Finding catechic tannins are studied using the Stiasny. 5-6 mL of each if the white flakes are formed then test is positive. This test is negative for the flowers.

Detection of flavonoids

The flavonoids are detected using the petroleum ether and certain fatty material with the 80% ethanol formation of the gray colour indicate the formation of flavonoids. This test is positive for the flowers [16, 17].

Detection of saponosides

To find saponins [16] if the persistent activity was observed the presence of the saponosides.

Determination of total phenolic content

This [16, 17, 18, 19, 20] is determined by the Folin-Cinocalteu method given by Lister and Wilson This test was positive for the phenolic content. by using this protocol we can determined the % of the phenol content also.

Determination of flavonoids content

The Flavonoid present in the given plant extracts measured colorimetric method [16] by using this protocol we can determine the percentage of the Flavonoid.

Antioxidant Activity (AA)

Free radical scavenging activity (DPPH)

The free radical Radical scavenging activity of the various plant extracts was measured by 1-1-diphenyl-2-picrylhydrazil (DPPH) [21], this was measured at 517nm. The standard used ascorbic acid and BHT. Results obtained were given in the table.

DPPH Scavenging Test

Quantitative measurement of radical scavenging study was carried out in a simple universal bottle. The reaction mixture contained 50 µl of test samples (or 80% MeOH as blank) and 5 mL of a 0.004% (w/v) solution of DPPH in methanol [22]. Using given standard protocol which was reported earlier.

Results

Table 1: Antioxidant activity of Flower Extract

Conc. mg/mL	BHT	Ethanol	Water	Methanol
0.05	48.12	44.63	28.55	36.48
0.1	53.92	48.68	29.53	39.92
0.2	55.26	51.24	36.50	44.80
0.3	61.54	56.14	43.00	32.92

Table 2: Antioxidant activity of Leaves Extract

Conc. mg/mL	BHT	Ethanol	Water	Methanol
0.05	48.12	44.68	28.38	33.58
0.1	53.92	49.72	32.38	39.64
0.2	55.26	53.82	41.57	41.68

Results

We have studied the Phytochemistry of the *Ceropegia jaini* the proper test was performed using the protocol given in the literature. The results showed that the *Ceropegia jaini* extract have good antioxidant activity. It also comprises the phytochemicals such as flavonoids, alkaloids, quinines, phenols, carbohydrates and terpenoids they also encompass the flavonoids antioxidant property due to the chelating possessions. The aqueous extract of plant shows better antioxidant activity.

Discussion

Ceropegia jaini is a medicinal plant of the family *apocynaceae*. Various extract of the leaves and Flowers can show the recovering antioxidant activity. The results divulge the presence of alkaloids, flavonoids, steroids, terpenoids, saponins, cardiac glycosides, and reducing sugars in the juice or extract can be studied using the perfect protocol.

Conclusion

The various results of the contemporary study prove that aqueous extract of leaves and stem of *Ceropegia jaini* controlled the phytochemicals such as flavonoids, terpenoids, alkaloids, phenols, quinines, and carbohydrate. The extract was found to have gifted Antioxidant activity against It seems that the use of plant extract of leaves and Flowers as an antioxidant agent would be apposite for the development of cost-effective, safe and efficient novel drugs active in contradiction of several pathogenic multidrug-resistant microorganisms in the future. It could be used as a natural antioxidant and also characterizes a beneficial healing supplement.

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Conflict of interest

Conflict of interest declared none.

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