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# Antioxidant Capacity of Achyranthes Coynei Sant

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**Abstract:** *The Apiaceae family contains the plant Achyranthes coynei Sant, which has beneficial biological uses. The chemical makeup of Achyranthes coynei Sant demonstrates how it can be used in specific Ayurveda compositions. The goal of the current study is to identify phytochemicals and determine whether leaf and stem extract has antioxidant potential. All of the extract from the leaves and stem exhibits the best antioxidant activity, according to our experimental findings. Antioxidant activity was determined using the DPPH method and phytochemical research using established methodologies. A phytochemical examination of the leaves was conducted in order to determine the medical potential of the plants. Several extracts also demonstrated strong antioxidant activity.*

**Keywords:** Sterols, Reducing Sugars, Alkaloids, Achyranthes coynei Sant, Antioxidant, Phytochemical

## I. INTRODUCTION

In daily living, antioxidants are crucial components. In nature, prooxidants are produced by noxious substances, oxygen radicals, and other free radicals. Free radicals are extremely reactive and readily interact with lipid, protein, and DNA molecules in living things, damaging cells and tissues. To counteract this damage, we need substances known as antioxidants, which serve as scavengers. The majority of oxidants are found naturally in fruits and vegetables [17]. The majority of antioxidants include phenolic, Ascorbic acid, carotenoids, vitamins, and phenolic. Simple antioxidants are water insoluble, and bioorganic is known s lipophilic antioxidant [811].

Free radicals are responsible for cell damage. The majority of these sources, including ozone, cosmic radiation, many impacts may be caused by UV light, electromagnetic radiation, cigarette smoke, and low wavelength electromagnetic radiations. Superoxide anion (O2), hydrogen peroxide (H2O2), peroxyl radicals (ROO), hydroxyl radicals (OH), nitrogen derived radicals (RNS), and oxygen derived radicals are some examples of supplies for a second common technique (ROS).

Nitric oxide (NO), dinitrogen trioxide (N2O3), peroxynitrogen dioxide (NO2), and nitrite anion are common nitrogen donors for free radicals (ONOO) [12] Today, many cells have decent or very good prooxidants, which counteract antioxidants and maintain the health of the cells. Because the majority of prooxidants raise the oxygen percentage, which leads to a rise in free radicals, we must take action when antioxidant levels are low. Oxidative stress is a condition that harms cells when the prooxidants fraction increases. Antioxidants that are natural or herbal are widely utilized today [1417] and exhibit excellent antioxidant activity. They serve as stand-in antioxidants.

### 1.0 Plant Description

Achyranthes coynei Sant. Is a rare, endemic plant species that is a member of the Amaranthaceae family Until recently, Karnataka was the only state where it was recorded to occur [6]. The wellknown medicinal plant from the family used to treat a variety of illnesses is Achyranthes aspera L. [7]. Because of its similar look, Achyranthes coynei, also called locally as "Kempuuttarani," is substituted for A. aspera in the treatment of diseases that are similar [6]. A. coynei's green leaves, stem, and inflorescences were harvested from a single fruit or vegetable.

Plants are examined for antioxidant activity, and plant material is extracted using a traditional technique like refluxing in various solvents. The antioxidant capacities of these Extract are examined. Chemicals called DPPH were used to assess their antioxidant activity (2, 2-diphenyl-1 picrylhydrazyl). The majority of the plant has low to excellent antioxidant properties.

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## II. EXPERIMENTAL

### 2.1. Reagents

Analyticalandmoleculargrade compounds were utilised throughout. They are bought from Loba chemicals and S.D.Fine.

### 2.2. Collection of Plant Materials

The plant material Achyranthes coynei Sant was gathered in the Maharashtra region of India, specifically in Raigad and nearby Sayhadri regions. Dr. B. K. Auti from the RadhabaiMahilaMahavidyalya in Ahmednagar recognised the plant.

### 2.3 Experimental

The plant material was obtained from the stems and leaves of Achyranthes coynei Sant. This plant material was blended into a fine powder after being dried completely at room temperature. The extract was made using a variety of solvents, including water-ethanol (1-6 V/V), dichloromethane, ethyl acetate, and hexane. The Soxhlet extraction technique was used to accomplish this. Following the proper protocol, further biological activity was carried out after phytochemical [18–19] testing.

### 2.3.1 Detection of Sterol

Polyterpenes When these substances are detected using the LIEBERMANN reagent test, a blue-green colour appears, signifying the presence of a steroid, but no pink colour remains, indicating the lack of terpenes.

### 2.2.2 Detection of Reducing Sugars

By using the Fehling reagent and the Tollens reagent test, reducing sugars were found in the sample. A red brick forms after a minute of heating the bath to 70 °C when 56 ml of extract is added to 56 ml of Fehling's solution to conduct the Fehling test, showing a favourable response. In the Tollens test, 5 ml of extract was combined with 56 ml of Tollens reagent to create a silver mirror.

### 2.2.3 Alkaloid

Using Bouchardat reagent and (iodoiodized reagent) were identified (reagent iodobismuthate of potassium). Dragendorff Six to seven cycles of evaporation were used for each solution. In 6-7 mL of 60° alcohol, the residue is absorbed. The formation of alkoloid is orange. [23–26] Alkaloids

### 2.2.4 Detection of Proteins:

The biuret reaction helped to identify the proteins [27-29] in the extracts. Add 2 to 3 drops of an aqueous portion of CuSO4 to 2% to a tiny amount of extract that has been diluted in 2 ml of 20% aqueous NaOH in a test tube. Protein-containing formations are purple in colour.

### 2.2.5 Detection of Coumarins:

Each extraction residue should yield 2 ml of the ethanolic solution, which should be divided between two test tubes. One test tube should contain 0.5 cc of 10% NaOH, and both test tubes should be heated in a water bath until boiling. Each test tube's 4 cc of distilled water needs to be chilled. When the liquid from the test tube in which the alkaline solution was added is transparent or more translucent than the liquid from the control test tube, a faint yellow solution that indicates the presence of coumarin will appear (without the alkaline solution)[30].

### 2.2.6 Detection of Tannins

The Stiasny discovered reagent [31] finds catechic tannins. In an oven, 5–6 Ml of each extract were dried out. Place the residue in a water bath at 80 to 900C for 20 to 30 minutes after adding 10 to 15 mL of the reagent Stiasny. There are no big flakes or tannin-like precipitate. Gallic tannins won't exist if tannins are lacking.[31-36]

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**2.2.7 Detection of Flavonoids**

0.5 to 1 mL of plant extract. Add 1020 mL of 80% ethanol to the residue and filter. The flavonoids are produced by filtering 5 mL of each plant's aqueous extract with a little amount of ammonia, then adding concentrated H2SO4. [37-40]

**2.2.8 Detection of Saponosides**

Oily debris can be easily removed using petroleum ether and 0.5 to 1 mL of plant extract. Add 1020 mL of 80% ethanol to the residue and filter. The flavonoids are produced by filtering 5 mL of each plant's aqueous extract with a little amount of ammonia, then adding concentrated H2SO4

**2.2.9 Total phenolic content**

Ciocalteu method described by Lister and Wilson [12], this [30, 3438] is ascertained. The Folin-Ciocalteu reagent water was diluted 1:10, 115, and 4 mL of Na2CO3 (7.5%, w/v) were added to 0.51 mL of the sample solution. After 30 minutes of incubation at 4045 °C in a water bath, the mixture's absorbance at 765 nm was measured against a blank sample using a spectrophotometer or UV–Vis spectrophotometer. The typical Gallic acid content ranges from 0 to 200 mg/L.

**2.4 Determination of Flavonoids Content**

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**2.5 Antioxidant Activity (AA) by the DPPH Method**

DPPH Scavenging Test:

As per protocol

Table 1: Antioxidant activity of leaves Extract

| Conc. Mg/ml | BHT | Ethanol | Water | Methanol |
|---|---|---|---|---|
| 0.05 | 47.1 | 34.63 | 26.57 | 48.47 |
| 0.1 | 48.91 | 27.66 | 27.53 | 55 .94 |
| 0.2 | 52.24 | 46.28 | 39.56 | 57 .88 |
| 0.3 | 59.57 | 54.17 | 46.08 | 36 .98 |

Table 2: Antioxidant activity of Stem Extract

| Conc. Mg/ml | BHT | Ethanol | Water | Methanol |
|---|---|---|---|---|
| 0.05 | 47.1 | 32.60 | 28 .91 | 25 .57 |
| 0.1 | 48.91 | 27 .73 | 23 88 | 32 .60 |
| 0.2 | 52.24 | 29 .01 | 21 .77 | 23 .69 |

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## III. RESULTS

In accordance with the prescribed procedure, qualitative analyses on the phytochemicals in Achyranthes coynei Sant were carried out. The Achyranthes coynei Sant extract had good antioxidant activity, according to the findings. Moreover, it contains phytochemicals such terpenoids, alkaloids, quinines, phenols, and sugars. Due to their chelating properties, they also include flavonoids, which have antioxidant properties. Better antioxidant activity is demonstrated by the plant's aqueous extract.

## IV. DISCUSSION

The plant Achyranthes coynei Sant belongs to the Apiaceae family and is very medicinal. Different leaf and stem extracts can exhibit greater antioxidant activity. The findings show that the ideal procedure can be used to investigate the presence of reducing sugars, alkaloids, flavonoids, steroids, terpenoids, saponins, and cardiacglycosides in the juice or extract.

## V. CONCLUSION

The findings of this study show that phytochemicals such flavonoids, terpenoids, alkaloids, phenols, quinines, and carbohydrates were present in the aqueous extract of Achyranthes coynei Sant's leaves and stem. Promising antioxidant activity against various bacterial species was discovered in the extract. The utilisation of plant extract from the leaves and stem as an antioxidant agent seems to be appropriate for the future creation of affordable, secure, and effective innovative medications that are active against a variety of pathogenic multidrugresistant microbes. It is both a potential natural antibacterial and a beneficial medicinal supplement.

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