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Research Article

Antioxidant Potential of Arogyavardhini Vati Extract by DPPH Assay

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Abstract

Arogyavardhini Vati, an Ayurvedic medicine, was commonly used during the COVID-19 pandemic for its immunomodulatory and therapeutic properties. The DPPH radical scavenging assay in this study revealed its antioxidant potential. This Ayurvedic medicine demonstrated considerable antioxidant capability with 78.04% DPPH scavenging activity. These findings support its traditional use and suggest the need for further investigation.

Keywords: Arogyavardhini Vati, DPPH assay, antioxidant activity, ethanol extract, COVID-19, Soxhlet's extraction, etc.

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INTRODUCTION:

Ayurvedic drugs often contain a wide range of medicinal herbs that are high in bioactive compounds, particularly phenolics and flavonoids. These bioactive compounds are strongly associated with antioxidant and free-radical scavenging activities.[1,2] Arogyavardhini Vati is a traditional Ayurvedic herb used to improve liver function, regulate metabolism and boost immunity.[3] Some research indicates that this formulation possesses antioxidant and anti-inflammatory properties.[4]

Many infectious and chronic illnesses, including heart disease, diabetes, neurological disorders and infections like COVID-19 are influenced by oxidative stress.[5,6] It occurs when the body develops an excess of damaging chemicals known as reactive oxygen species (ROS) and the natural antioxidants are insufficient to counteract them. This imbalance can damage essential cellular components such as fats, proteins, DNA and may also disturb immune function leading to long-term inflammation.[7] In COVID-19, oxidative stress has been linked to more serious illness, lung damage, and the immune system's overreaction known as a cytokine storm.[8]

During the COVID-19 pandemic, several Ayurveda practitioners and state-level guidelines listed Arogyavardhini Vati among medicines recognized for its liver-protective, immune-supporting and rejuvenating properties.[9,10] However, there is still limited scientific research specifically testing its antioxidant activity. Therefore, this study aims to scientifically evaluate the antioxidant efficacy of Arogyavardhini Vati (coded as ADC-05) using the DPPH (2, 2-diphenyl-1-picrylhydrazyl) radical scavenging assay.

MATERIALS AND METHODS:

Chemicals and Reagents:

The chemicals DPPH, ethanol as a solvent, ascorbic acid (for positive control), methanol and distilled water were used to test the antioxidant activity of Arogyavardhini Vati.

Sample Preparation:

Arogyavardhini Vati tablets were finely powdered and subjected to Soxhlet's extraction using ethanol as the solvent.[11]

Table 1: Ingredients of Arogyavardhini Vati and their uses [12]

S. N.	Botanical / Source Name	Ingredient	Plant Parts Used	Traditional Use / Function	Ref
1.	*Picrorhiza kurroa* Royle ex Benth.	Katuka	Rhizome	Hepatoprotective, antioxidant	13
2.	*Phyllanthus emblica* L.	Amalaki	Fruit	Antioxidant, immune booster	14
3.	*Terminalia chebula* Retz.	Haritaki	Fruit	Detoxification, rejuvenative	15
4.	*Terminalia bellirica* (Gaertn.) Roxb.	Bibhitaki	Fruit	Rejuvenative, anti-inflammatory	16
5.	*Commiphora wightii* (Arn.) Bhandari	Shuddha guggulu	Exudes	Anti-inflammatory, Anti-arthritic	17
6.	*Plumbago zeylanica* L.	Chitraka moola	Root	Digestive Stimulant, Anti-inflammatory and Analgesic	18,19
7.	*Azadirachta indica* A. Juss.	Nimba Patraswarasa	Leaf	Antibacterial, Antiviral, Antipyretic, Anti-inflammatory, Immunomodulatory and Hepatoprotective	20,21,22
8.	Mineral exudate	Shilajatu		Bioenhancer, adaptogen	23
9.	Copper calx	Tamra Bhasma		Hepatoprotective, antioxidant	24
10.	Purified and incinerated Mica (Biotite)	Abhraka Bhasma		Rejuvenator, immunomodulator, and respiratory tonic	25
11.	Iron calx	Loha Bhasma		Hematinic, antioxidant, used as an iron supplement for anemia, weakness, and to support liver function and immunity.	26
12.	Purified Sulphur	Shuddha Gandhaka		Antimicrobial, skin-purifying, and Rasayana (rejuvenative) actions	27
13.	Purified Mercury	Shuddha Parada		Used in various herbo-metallic formulations for rejuvenation, detoxification, and vitality enhancement.	28

The Soxhlet's apparatus was operated to ensure exhaustive extraction. After extraction, the extract was concentrated under reduced pressure using a rotary evaporator. The concentrated extract was then stored in an amber-coloured airtight glass bottle at 4°C until further use, to protect it from light and oxidative degradation.[29]

DPPH Assay Procedure:

The antioxidant activity of the sample was evaluated using the free radical scavenging method.[30] A 0.1 mM DPPH solution was prepared in methanol. Equal volumes (1 ml each) of the DPPH solution and the sample extract were mixed and incubated in the dark at room temperature for 30 minutes. The decrease in absorbance was measured at 517 nm using a UV-Visible spectrophotometer.

Calculation of Scavenging Activity:

$$\text{DPPH Scavenged (\%)} = ((A - S)/A) \times 100$$

Where:

A = Absorbance of blank (0.6443)

S = Absorbance of sample (0.1415)

RESULTS AND DISCUSSION:

The ethanol extract of Arogyavardhini Vati showed an absorbance of 0.1415, resulting in a DPPH scavenging activity of 78.04%. The positive control, ascorbic acid, demonstrated a scavenging activity of 96.12%. These results confirm the strong antioxidant properties of Arogyavardhini Vati.

Table 2: DPPH Radical Scavenging Activity of Test Sample ADC-05

S. N.	Sample	Absorbance	DPPH Scavenged %
1.	DPPH Control	0.6443	—
2.	Ascorbic Acid (Positive Control)	0.0250	96.12
3.	Arogyavardhini Vati 'ADC-05'	0.1415	78.038181

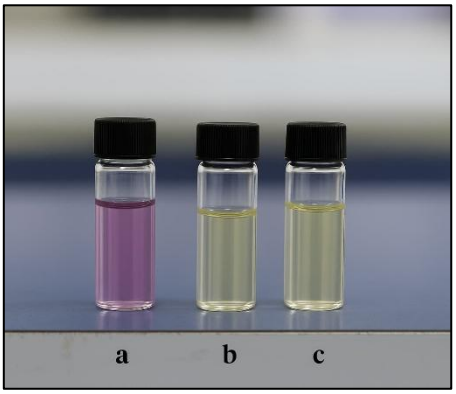

Figure 1: Visual representation of test samples analyzed under UV-Spectrophotometer.

(a) Blank **(b)** Positive control **(c)** Sample (ADC-05 ethanolic extract after reaction with DPPH)

The observed antioxidant activity suggests that Arogyavardhini Vati can significantly neutralize free radicals. This aligns with its traditional use for detoxification and immune support. Further phytochemical analysis and *In vivo* studies are recommended to explore the full therapeutic potential.

CONCLUSION:

Arogyavardhini Vati showed strong antioxidant activity in the DPPH assay, confirming its traditional use and suggesting a role in managing oxidative stress. This supports its relevance in treating conditions like COVID-19, where oxidative imbalance is prevalent.

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Conflicts of Interest: There is no conflict of interest among the authors.

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