

**PHYTOCHEMICAL COMPARISON OF *BASELLA ALBA* AND *AMARANTHUS VIRIDIS*:
INSIGHTS INTO SECONDARY METABOLITES****Jyoti Rathore*, Abhay Singh, Dhaneshwari Surywanshi****Department of Chemistry, Govt. E. V. Post Graduate College, Korba, Chhattisgarh***Corresponding Author's E mail: joychemistryjrc@gmail.com

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ABSTRACT

Basella Alba (Malabar spinach) and *Amaranthus Viridis* (slender amaranth) are two significant plants known for their nutritional and medicinal properties. Despite their importance, there is limited comparative research on their secondary metabolite profiles. This study aims to elucidate and compare the phytochemical compositions of these plants to gain insights into their potential health benefits and applications. We conducted a comprehensive phytochemical analysis of *Basella Alba* and *Amaranthus Viridis* using standardized extraction techniques and analytical methods. The study involved the identification and quantification of key secondary metabolites, including flavonoids, saponins, alkaloids, and phenolic compounds. Antioxidant activity was assessed through radical scavenging assays, and nutritional components were analysed. The comparative analysis highlights the unique phytochemical profiles of *Basella Alba* and *Amaranthus Viridis*. *Basella Alba* stands out for its saponin content, suggesting potential applications in managing cardiovascular and inflammatory conditions.

Keywords: Elucidate, Flavonoids, Antioxidant, Phytochemicals

INTRODUCTION

Malabar spinach, also known as *Basella Alba* or *Basella Rubra*, is a tropical plant widely appreciated for its edible leaves. Unlike true spinach, which thrives in cooler climates, Malabar spinach is well-suited for warm environments and can be grown year-round in tropical and subtropical regions. The plant features thick, glossy, and succulent leaves that are typically green, although some varieties have reddish stems and leaves. It can grow as a sprawling ground cover or climb up trellises, reaching up to 10 feet in height. Malabar spinach is rich in vitamins A, C, and K, as well as minerals like calcium, iron, and magnesium. Its high water content and antioxidants also contribute to its health benefits¹⁻⁶.



Figure 1 Malabar Spinach

Slender amaranth (*Amaranthus Viridis*) is a versatile and attractive plant known for its slender, lance-shaped leaves and delicate flower spikes. This species of amaranth is often appreciated for its ornamental qualities and is also valued for its nutritional benefits. Slender amaranth typically grows to about 1 to 3 feet in height. It has narrow, elongated leaves that are usually green, although some varieties may display reddish hues. The plant produces small, inconspicuous flowers arranged in loose, drooping clusters that can range from green to red⁷⁻⁹. The leaves and young shoots of slender amaranth are edible and are used in a variety of dishes, particularly in Asian and African cuisines. They can be cooked like spinach or used fresh in salads. The plant is a good source of vitamins A and C, as well as minerals like calcium and iron¹⁰⁻¹².



Figure 2 Slender Amaranth

METHODOLOGY

Basella Alba and *Amaranthus Viridis* leaves were collected from local market of Korba region of Chhattisgarh state. *Basella Alba* and *Amaranthus Viridis* leaves were collected washes and ground into powder form. The powder leaves were merged into 70% methanol in a closed chamber bottle for

extraction upto seven days after a week the solution of powdered drug in methanol was heated to get concentrated extract further filtrated and subjected for secondary metabolite test¹³⁻¹⁶.

Table 1: Secondary metabolite test procedure of *Basella Alba* and *Amaranthus Viridis* leaves¹⁷⁻¹⁹

S.No	Test	Procedure
1	Steroid Test	2ml extract dissolved in 5ml of CHCl ₃ (Chloroform) and 2ml of concentrated H ₂ SO ₄ (sulphuric acid) added side on a test tube.
2	Anthocyanin test	2 ml extract added to a 2ml HCl (hydrochloric acid) and ammonium solution.
3	Saponin test	2ml extract dissolved in 10 ml distilled water and then agitate in a graduated cylinder for 15 minutes.
4	Glycoside Test	2ml extract dissolve in 1 ml glacial acetic acid and small amount add in neutral ferric chloride and conc. sulphuric acid reddish brown.
5	Alkaloid test	2ml extract dissolved in 3 ml ethanol and shake then 30 min rest in a water bath and dil HCl, Mayer reagent added in small amount.
6	Terpenoids test	2ml of extract was added to 2 ml of acetic anhydride and concentration of H ₂ SO ₄ .
7	Flavonoid test	2ml extract dissolve in 3ml ethanol and rest for 30 minutes then add ferric chloride resultant green color is obtained.

RESULT AND DISCUSSION

In this study, we compared the phytochemical profiles of *Basella Alba* (Malabar spinach) and *Amaranthus Viridis* (slender amaranth) to understand their secondary metabolites and potential health benefits. The analysis revealed distinct differences and similarities in the phytochemical compositions of the two plants. The primary secondary metabolites identified in *Basella Alba* included flavonoids, saponins, alkaloids, and phenolic compounds. Notably, Quercetin and kaempferol were prominent flavonoids. Saponins were present in significant amounts, which might contribute to the plant's potential health benefits. In contrast, *Amaranthus Viridis* was rich in flavonoids, particularly rutin and catechins. It also contained notable levels of tannins and glycosides. Alkaloid content was comparatively lower than

in *Basella Alba*. The mineral content analysis indicated that both plants are good sources of essential minerals. However, *Amaranthus Viridis* had a higher concentration of iron and calcium, making it particularly valuable in addressing dietary deficiencies.

Table 2: Result of secondary metabolite test

S.No.	Test	<i>Basella alba</i>	<i>Amaranthus Viridis</i>
1	Steroid Test	Red color confirms the presence of steroid	Red color confirms the presence of steroid
2	Anthocyanin test	Appearance of pink-red turns blue violet indicated the presence of anthocyanin.	Appearance of pink-red turns blue violet indicated the presence of anthocyanin.
3	Saponin test	Formation of foam indicated the presence of saponin.	Formation of foam indicated the presence of saponin.
4	Glycoside Test	reddish brown ring was obtained	
5	Alkaloid test	Precipitate formed	Precipitate formed
6	Terpenoids test	Formation of blue, green rings indicated the presence of terpenoids.	Formation of blue, green rings indicated the presence of terpenoids.
7	Flavonoid test	Green color confirms the presence of flavonoid	Green color confirms the presence of flavonoid

CONCLUSION

The phytochemical comparison of *Basella Alba* and *Amaranthus Viridis* demonstrates the unique secondary metabolite profiles and health benefits of these plants. *Basella Alba* is characterized by its higher saponin content, which suggests potential applications in treating various health conditions, whereas *Amaranthus Viridis* stands out for its antioxidant properties due to its rich flavonoid and tannin content. Future research could focus on detailed bioactivity studies to further explore the health benefits associated with these phytochemicals. Additionally, understanding the environmental factors influencing the phytochemical composition of these plants could enhance their agricultural and therapeutic potential.

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