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# Phytochemical Screening Study of *Martynia annua*



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**Padmapriya M, Prabhitha K.S, Devika R and  
Sugashini P.K**

*Department of Biotechnology, Aarupadai Veedu Institute  
of Technology, Paiyanoor-603 104, India.*

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## ABSTRACT

Nature has been a good source of medicinal agents for thousands of years and an impressive number of modern drugs based on their use in traditional medicine. Phytochemicals are generally referred to have a significant role as essential nutrients and highly potential to cure many diseases. The present study deals with the extraction of various phytochemicals with three different solvents (Ethanol, Methanol and Chloroform). The methanolic extracts of the targeted plant *Martynia annua* registered the maximum amount of phytochemicals in the various parts of plant (leaf, stem and flower) than the other two solvents (ethanol and chloroform) which have proved that the plants are known for its therapeutic value.



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## INTRODUCTION

Plants are the richest bio-resources for their wide variety of chemical compounds which have important biological functions and enables as a herbal medicines having beneficiary role in the pharmacology [1,2]. India is one of the leading countries in Asia in terms of wealth of herbal medicines and employs a large number of plant species in Ayurveda (2000 species), Siddha (1121 species), Unani (751 species) and Tibetan (337 species) [3,4]. Traditional Ayurvedic medicinal plants are being used in medicine for the treatment of different human ailments [5] and the bioactive compounds such as alkaloids, tannins, flavonoids and phenolic compounds have definite physiological action on the human body [6]. All most all the bioactive constituents are known to have therapeutic value as anti-constipative [7], spasmolytic[8], antibacterial, antifungal [9], anti-inflammatory [10], insecticidal [11], antioxidant [12]. *Cocculus hirsulis* extracts are used for curing cough, gonorrhoea, ophthalmia, eczema, prurigo, neuralgia [13,14]. Various plant parts of *Artemisia nilagirica* were analysed and reported that the leaf predominantly revealed the existence of fluorescence chemical constituents [15], wherein the leaf sample registered more than the other parts. *Martynia annua* commonly known as 'Pulinagam' is used by Santhal tribals for fever, hair loss, scabies, sores and carbuncles on the back. Therefore, in the present investigation, various parts of *Martynia annua* were subjected to phytochemical screening with three different solvents.

## MATERIALS AND METHODS

Disease free fresh plant (*Martynia annua*) were collected, cleaned thoroughly and the plant parts (leaf, stem and flower) were segregated separately. The various parts were air dried and after total dryness, the plant materials were ground to fine powder using a blender and stored in separate airtight containers for further investigation. A known quantity of powdered sample (leaf, stem and flower) were subjected to qualitative phytochemical analysis with three different solvents (methanol, ethanol and chloroform) for carbohydrate [17], tannins [18], flavonoids, cardiac glycosides, terpenoids, phylobatannins, anthraquinones [19], alkaloids [20], saponins [21], quinones, phenols and coumarins [22].

## RESULTS AND DISCUSSION

A known amount of (20 g) of powdered samples (leaf, stem and flower) were subjected for extraction with three solvents (methanol, ethanol and chloroform). In the present investigation, around 15 phytochemical tests were carried out to identify their presence qualitatively. In the present investigation, the methanolic extract of leaf, stem and flower samples were identified and recorded in Table 1.

**Table 1: Phytochemical analysis of methanolic extract**

S.NO	PHYTOCHEMICALS	METHANOLIC EXTRACT		
		LEAVES	STEM	FLOWER
1	Carbohydrates	Appearance of red colour	Appearance of red colour	Appearance of red colour
2	Tannins	Appearance of greenish black colour	No greenish black colour	Appearance of greenish black colour
3	Saponins	Appearance of layer of foam	No layer of foam	Appearance of layer of foam
4	Flavonoids	Appearance of yellow colour	Appearance of yellow colour	Appearance of yellow colour
5	Alkaloids	Appearance of green colour	No green colour	No green colour
6	Quinones	Appearance of red colour	Appearance of red colour	Appearance of red colour
7	Glycosides	No pink colour	No pink colour	No pink colour
8	Cardiac glycerides	No brown ring	Appearance of brown ring	No brown ring
9	Terpenoids	Appearance of red brown colour	No red brown colour	No red brown colour
10	Phenols	Appearance of blue colour	No blue colour	Appearance of blue colour

11	Coumarins	No yellow colour	Appearance of yellow colour	Appearance of yellow colour
12	Proteins and amino acids	Appearance of blue colour	No blue colour	Appearance of blue colour
13	Steroids and polysteroids	Appearance of bluish brown ring	No bluish brown colour ring	No bluish brown colour ring
14	Phlobatannins	Appearance of red colour	No red colour	No red colour
15	Anthraquinone	No pink colour	No pink colour	No pink colour

From the above results, the methanolic leaf extract showed positive results for carbohydrates, tannins, saponins, flavonoids, alkaloids, quinones, terpenoids, phenols, proteins, steroids and phylobatannins. Around eight phytochemicals showed positive results for carbohydrate, tannin, saponin, flavonoids, quinones, phenol, coumarins and proteins. The methanolic stem extract registered very few positive result for carbohydrate, flavonoid, quinones, cardiac glycerides and coumarins. The root and stem sample of *Artemisia nilagirica* registered three and four positive with hexane, respectively [23] but ethyl acetate extract registered maximum result in both the samples.

**Table 2: Phytochemical analysis of chloroform extract**

Sr.No	PHYTOCHEMICALS	CHLOROFORM EXTRACT		
		LEAVES	STEM	FLOWER
1	Carbohydrates	No red colour	No red colour	Appearance of red colour
2	Tannins	No greenish black colour	No greenish black colour	No greenish black colour
3	Saponins	No layer of foam	No layer of foam	No layer of foam
4	Flavonoids	No yellow colour	No yellow colour	No yellow colour
5	Alkaloids	No green colour	No green colour	No green colour
6	Quinones	No red colour	No red colour	Appearance of red colour
7	Glycosides	No pink colour	No pink colour	No pink colour
8	Cardiac glycerides	No brown ring	No brown ring	No brown ring
9	Terpenoids	No red brown colour	No red brown colour	No red brown colour
10	Phenols	No blue colour	No blue colour	No blue colour
11	Coumarins	No yellow colour	No yellow colour	No yellow colour
12	Proteins and amino acids	No blue colour	No blue colour	No blue colour
13	Steroids and polysteroids	No bluish brown ring	No bluish brown colour ring	No bluish brown colour ring
14	Phlobatannins	No red colour	No red colour	No red colour
15	Anthraquinone	No pink colour	No pink colour	No pink colour

The phytochemical analysis of chloroform extract of leaf, stem and flower did not show positive result in both leaf and stem extract during the study period. The flower extract registered significant two positive results for carbohydrate and quinone and other phytochemical analysis showed negative results (Table 2). The preliminary screening of the flower of *Woodfordia fruticosa* revealed the presence of carbohydrates, tannins and glycosides in major quantities, phenols in moderate quantity and anthraquinones and flavonoids in minor quantity [24].

The ethanolic extract showed a better result than the chloroform solvent extract. The ethanolic leaf extract showed positive result for alkaloids, quinones, terpenoids and phenol and other phytochemical analysis registered negative result. During the period of study, the ethanolic stem and flower registered positive results for alkaloids, terpenoids and steroids, respectively (Table 3). *Ficus racemosa* leaf extract registered positive results for phenol, flavonoids in all the solvents (ethanol, methanol, ethyl acetate, acetone and n-hexane) [25].

**Table 3: Phytochemical analysis of ethanolic extract**

S.NO	PHYTOCHEMICALS	ETHANOLIC EXTRACT		
		LEAVES	STEM	FLOWER
1	Carbohydrates	No red colour	No red colour	No red colour
2	Tannins	No greenish black colour	No greenish black colour	No greenish black colour
3	Saponins	No layer of foam	No layer of foam	No layer of foam
4	Flavonoids	No yellow colour	No yellow colour	No yellow colour
5	Alkaloids	Appearance of green colour	No green colour	No green colour
6	Quinones	Appearance of red colour	No red colour	No red colour
7	Glycosides	No pink colour	No pink colour	No pink colour
8	Cardiac glycerides	No brown ring	No brown ring	No brown ring
9	Terpenoids	Appearance of red	Appearance of	Appearance of

		brown colour	red brown colour	red brown colour
10	Phenols	Appearance of blue colour	No blue colour	No blue colour
11	Coumarins	No yellow colour	No yellow colour	No yellow colour
12	Proteins and amino acids	No blue colour	No blue colour	No blue colour
13	Steroids and polysteroids	No bluish brown ring	Appearance of bluish brown colour ring	Appearance of bluish brown colour ring
14	Phlobatannins	No red colour	No red colour	No red colour
15	Antraquinone	No pink colour	No pink colour	No pink colour

## CONCLUSION

In the present investigation, it is proved that the methanol solvent has registered more phytochemicals than ethanol and chloroform and it also proved that the targeted plant *Martynia annua* has many therapeutic bioactive compounds in various part of the plant.

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