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PHYTOCHEMICAL VARIATION OF DIFFERENT LEAF EXTRACTS OF HYPTIS SUAVEOLENS (L.) POIT. COLLECTED FROM SIX DIFFERENT LOCALITIES IN SOUTH INDIA

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ABSTRACT

With increasing resistance of pest and pathogens to insecticides, pesticides and antibiotics, natural products from plants could be interesting alternatives for the synthetic chemicals. Some plant extracts and phytochemicals are known to have antimicrobial properties, and can be of great significance in therapeutic treatments. Hyptis suaveolens (L.) Poit. (Family Lameaceae) is an aromatic weed distributed through tropics and subtropics of the world. It has been reported in the previous studies that the plant H.suaveolens collected from different localities in south India shows genetic diversity. Therefore, the aim of the present study was to investigate the phytochemical variations according to the genetic diversity and the phytogeographical conditions. The result of present investigation shows that high level of genetic diversity causes changes in the phytoconstituents which could be attributed to the alterations in the environmental factors.

KEY WORDS: Genetic diversity, Phytochemical analysis, Plant extracts, Medicinal plants.

INTRODUCTION

The plant Hyptis suaveolans (L.) Poit. commonly known Wilayati tulsi is an aromatic, brushy shrub or woody herb. It is normally found in profoundly disturbed soil soils, and is called 'ruderal' species[1]. It is an ethnobotanically important medicinal plant that has been used for its anti-inflammatory[2], antioxidant[3], antiulcer[4], antidiarrhoea[5], antibacterial[6], antinociceptive[7], and insecticidal[8] activities.

Medicinal plants have been the subject of intense research as a result of their potential to serve as sources of biochemical drugs. Though the plant *Hyptis suaveolens* is found in major tropics and sub tropics of the world, it shows high genetic diversity. In the previous studies it was reported that the plant samples *Hyptis suaveolens* collected from different localities in south India shows genetic polymorphism[9]. The active principles differ from plant to plant according to their genetic diversity, physiological and environmental conditions.

MATERIALS AND METHODS

In the present study the fresh leaves of *Hyptis suaveolens* were collected randomly from six different localities in south India namely Tiruvannamalai, Chennai, Villupuram, Courtallam, Chithara (Kerala) and Vellimalai (Kalrayan hills) during the flowering stage. The collected leaves were washed repeatedly with tap water, then with distilled water and air dried for 7 days. The air dried materials were ground into powder and stored in air tight containers for future studies. 30 g of air dried powder was extracted separately each with organic solvents such as Petroleum ether, Ethyl acetate and Methanol.

Preliminary phytochemical screening using various qualitative chemical tests was performed to show the presence or absence of the different phytoconstituents in the leaf extracts. The following reagents were used to investigate the different biochemical groups, carbohydrates with Molisch's reagent and few drops of concentrated sulphuric acid[10], tannins with ferric chloride[11], saponins with their capability of producing foam[12,13] flavonoids with 2N sodium hydroxide[14], alkaloids with concentrated HCl and Mayer's reagent[15], quinones with concentrated sulphuric acid[16], glycosides with chloroform and 10% ammonia solution[17], cardiac glycosides with glacial acetic acid, 5% ferric chloride and concentrated sulphuric acid[14], terpenoids with chloroform and concentrated sulphuric acid[14], phenols with distilled water and 10% ferric chloride[16], coumarins with 10% NaOH,[16], steroids and phytosteroids with chloroform and concentrated sulphuric acid[18], phlobatannins with 2% HCl[14], Anthraquinones with 10% ammonia solution[14]. These biochemical groups were identified by characteristic colour changes using standard procedures.

RESULTS AND DISCUSSION

The results of phytochemical analysis for extracts of leaves of *Hyptis suaveolans* collected from the six different localities have been summarized in Table 1. The results showed that the Petroleum ether extracts of the plants collected from Tiruvannamalai, Villupuram and Chennai, India, contained more number of phytoconstituents than the other stations but for Ethyl acetate extracts more phytoconstituents were seen in Vellimalai followed by Villupuram, Courtallam and Kerala. In the case of extraction in Methanol the number phytochemical constituents was more in Chennai and Courtallam but less in the other stations and no extractives were obtained for Tiruvannamalai station.

Most of the extracts showed the presence of tannins and flavonoids, and so the plant was commonly known as 'bush tea' in Nigeria[19]. Among other phytochemical constituents alkaloids were present in methanol extracts of all stations except Tiruvannamalai. Terpenoids were present in the petroleum ether extracts of all stations except Kerala and Vellimalai while phenols were present in any one or more of the extracts of all stations except Kerala.

The results obtained in the present study are seen to be accordance with the previous studies on *H.* suaveolans[20] reporting change in phytochemical constitituents due to variation in geographical location. Presence of tannins, flavonoids, terpenoids and alkaloids in various combinations in the different extracts of the different localities has been corroborated based on earlier studies[21-24].

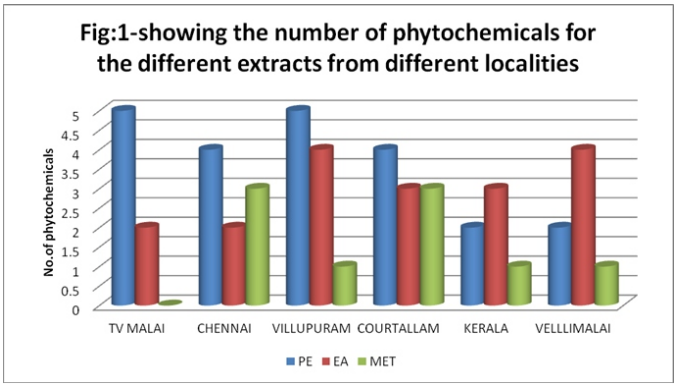
Table. 1 Phytochemical profile of leaf extracts of *Hyptis suaveolens* (L.) Poit. from different localities

Phytochemical Tests	Results																	
	T.V.Malai			Chennai			Vilupuram			Courtallam			Kerala			Vellimalai		
	PE	EA	ME	PE	EA	ME	PE	EA	ME	PE	EA	ME	PE	EA	ME	PE	EA	ME
Carbohydrates	-	+	-	-	+	-	-	+	-	-	+	-	-	+	-	-	+	-
Tannins	+	-	-	+	-	-	+	+	-	-	-	-	-	+	-	-	+	-
Saponins	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flavonoids	+	-	-	+	-	-	+	-	-	+	+	-	+	-	-	+	+	-
Alkaloid	-	-	-	-	-	+	-	+	+	-	-	+	-	-	+	-	-	+
Quinones	+	-	-	+	-	-	+	-	-	+	-	-	-	-	-	-	-	-
Glycosides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cardiac glycosides	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Terpenoids	+	-	-	+	-	-	+	-	-	+	-	-	-	-	-	-	-	-
Phenols	+	-	-	-	-	+	-	+	-	-	-	+	-	-	-	+	+	-
Coumarins	-	-	-	-	-	-	+	-	-	+	+	-	+	-	-	-	-	-
Steroids and Phytosteroids	-	-	-	-	-	PS	-	-	-	-	-	PS	-	-	-	-	-	-
Phlobatannins	-	+	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-
Anthraquinones	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

+ Present - Not detected PS Phytosteroids

CONCLUSION

Thus analysis of phytochemical constituents in well known medicinal plants could lead to discovery of new compounds that could be used more efficiently in medicinal and agriculture.



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