Analysis and Identification of Chemical compounds in *Plectranthus wightii* Benth.

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ABSTRACT

Plants used for traditional medicine contain a wide range of substances that can be used to treat chronic as well as infectious diseases. Clinical microbiologists have great interest in screening of medicinal plants for new therapeutics. The active principles of many drugs found in plants are secondary metabolites. In the present study, the bioactive component of *Plectranthus wightii* (Lamiaceae family) whole plant has been evaluated using Gas Chromatography-Mass Spectrum (GC-MS). Eight compounds in methanolic extract were identified. Amidephrine (24.63%) was the prevailing compound in methanolic extract, which is suggested to be an cardiovascular agent.

Keywords: Medicinal plant, GC-MS, *Plectranthus wightii*, Phytocompound

INTRODUCTION

Biologically active compounds from natural sources have always been of great interest to scientists working on infectious diseases. In modern medicines, plants occupy a significant place as raw material for some important drugs, although synthetic drugs and biotechnology have brought about a revolution in controlling different diseases. Also there is a growing tendency all over the world, to shift from synthetic to natural based products including medicinal and aromatic plants. Less than 5% of the plants have so far been analyzed as potential medicine and still there is a great scope of research in this field (Vohra and Kaur, 2011). Plant synthesizes a wide variety of chemical compounds, which can be sorted by their chemical class, bio synthetic origin and functional groups into primary & secondary metabolites. Knowledge of the chemical constituents of plants is desirable, not only for the discovery of therapeutic agents, but also because such information be of value in disclosing new resources of such chemical substances (Iqbal, 2012).

Genus *Plectranthus* (Lamiaceae) comprises about 300 species of herbs and shrubs native to tropical regions. The most frequently cited use of species of *Plectranthus* is for their medicinal properties, which accounts for over 85% of all uses (Dellar *et al*., 1996; Lukhola *et al*., 2006). The species are used for the treatment digestive disturbances (21 species), skin affections (20 species), respiratory infections (15 species), general infections and fever (20 species), genitourinary infections (08 species), pain (09 species), musculoskeletal conditions. *Plectranthus* species are used also to treat blood and circulation conditions and the nervous system disturbances (Lukhola *et al*., 2006). It is known that *Plectranthus* species present a great biosynthetic capacity to produce diverse chemical classes from secondary cell metabolism mainly diterpenoids and triterpenoids, some of them showing confirmed biological properties (Gaspar-Marques *et al*., 2006). Hence during the present investigations phytochemical screening of *Plectranthus wighti* is carried on with a view to analyse the presence of chemical constituents that secondary metabolites, with a view to recommend their application in pharmaceutical industry.

MATERIALS AND METHODS

The plant samples were collected from Nilgiris, The Western Ghats, Coimbatore District, Tamilnadu. The botanical identification of the plant was confirmed by Botanical Survey of India, Coimbatore (BSI/SRC/5/23/2012-13/Tech-1765 dated 1st Feb.2012).

Plant sample preparation

50gm powdered plant material was soaked in 200 ml of methanol overnight and then centrifuged through Whatman no.1 filter paper along with 2gm sodium sulfate to remove the sediments and traces of water in the filtrate. Before filtering the filter paper along with sodium sulphate is wetted with methanol. The filtrate is then concentrated by bubbling nitrogen gas into the solution and reduces the volume to 1ml. The extract contains both polar and non-polar phytocomponents.

GC-MS analysis

GC-MS analysis was carried out on a GC clarus 500 Perkin Elmer system comprising a AOC-20I auto sampler and gas chromatograph interfaced to a mass spectrophotometer instrument employing the following conditions: Column Elite-1 fused silica capillary column (30mm×0.25mm I.D ×1 µ M df, composed of 100% Dimethyl poly siloxane), operating in electron impact mode at 70 eV; helium (99.999%) was used as carrier gas at a constant flow of 1ml/min and an injection volume of 0.5 µ l was employed (split ratio of10:1) injector temperature 250 °C; ion-source temperature 280 °C. The oven temperature was programmed from 110 °C (isothermal for 2 min), with an increase of 10 °C/min, to 200 °C, then 5 °C/min to 280 °C, ending with a 9 min isothermal at 280 °C. Mass spectra were taken at 70 eV; a scan interval of 0.5 seconds and fragments from 45 to 450 Da. Total GC running time is 46min.

RESULTS AND DISCUSSION

The composition and identification of the main components present in the *Plectranthus wightii* are shown in (Table 1). Eight compounds were identified in *P. wightii* by GC-MS analysis. The active principles with their retention time (RT), percentage area and Reference No. are presented in (Table 1 and Fig 1). It was found that the main constituents of leaves Amidephrine (24.63%), Indan, 1-methyl- (19.33%), Isopropyl alcohol (15.59%), Propanamide, N-ethyl- (14.85%), 2-Furancarboxaldehyde, 5-(hydoxym) (11.65%) and 1-Propanamine, N1-methyl-2-methoxy (6.15%), Hexane (4.06%) and Benzene, 2-ethenyl-1,4-dimethyl- (3.73%). Amidephrine mesylate, a new potent sympathomimetic amine, which is used for cardiovascular actions (Stanton *et al*., 1965). In the present study eight chemical

Figure 1: GC-MS studies of *Plectranthus wightii*

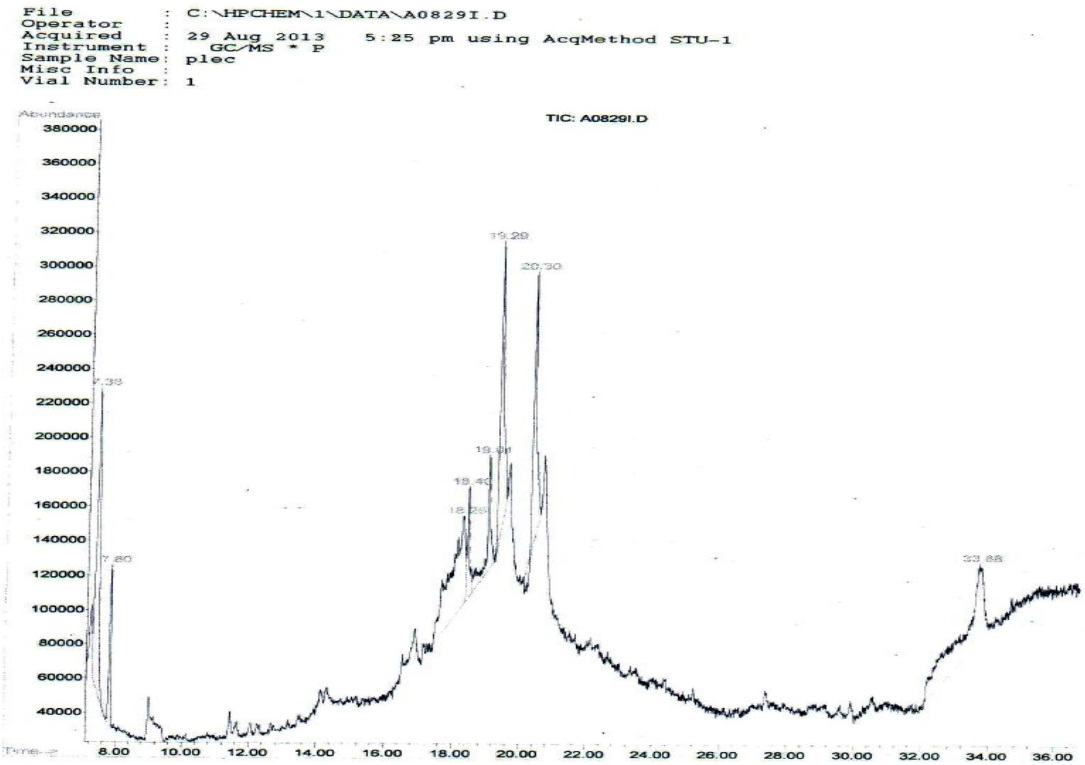

Table 1: GC-MS studies of *Plectranthus wightii*

constituents have been identified from methanol extract of aerial parts of *Plectranthus wighti* by GC-MS analysis. The existence of various bioactive chemical compounds proves the use of this plant various ailment by traditional medical practitioners.

Search Libraries: C:\DATABASE\NIST98.L Minimum Quality: 80

Unknown Spectrum: Apex
Integration Events: Chemstation Integrator - EVENTS.E

Pk#	RT	Area%	Library/ID	Ref#	CAS#	Qual
1	7.38	15.59	C:\DATABASE\NIST98.L			
			Isopropyl Alcohol	11521	000067-63-0	80
			Isopropyl Alcohol	110736	000067-63-0	72
			Isopropyl Alcohol	110784	000067-63-0	72
2	7.80	4.06	C:\DATABASE\NIST98.L			
			Hexane	112279	000110-54-3	72
			Hexane	16315	000110-54-3	52
			Hexane	112278	000110-54-3	50
3	18.25	19.33	C:\DATABASE\NIST98.L			
			1H-Indene, 2,3-dihydro-5-methyl-	52578	000874-35-1	43
			1H-Indene, 2,3-dihydro-4-methyl-	52579	000824-22-6	43
			Indan, 1-methyl-	120547	000767-58-8	43
4	18.40	3.73	C:\DATABASE\NIST98.L			
			Benzene, (1-methyl-1-propenyl)-, (	52564	000768-00-3	76
			Benzene, 2-ethenyl-1,4-dimethyl-	52571	002039-89-6	76
			Benzene, 2-ethenyl-1,4-dimethyl-	120546	002039-89-6	76
5	19.01	6.15	C:\DATABASE\NIST98.L			
			N-(Glycyl)alanine	10524	1000225-93-3	47
			1-[a-(1-Adamantyl)benzylidene]thio	10960	1000222-83-3	37
			1-Propanamine, N1-methyl-2-methoxy	10587	1000198-01-0	37
6	19.29	14.85	C:\DATABASE\NIST98.L			
			4H-Pyran-4-one, 2,3-dihydro-3,5-di	109420	028564-83-2	87
			4H-Pyran-4-one, 2,3-dihydro-3,5-di	4836	028564-83-2	83
			Propanamide, N-ethyl-	429	005129-72-6	32
7	20.30	11.65	C:\DATABASE\NIST98.L			
			2-Furancarboxaldehyde, 5-(hydroxym	118397	000067-47-0	70
			2-Furancarboxaldehyde, 5-(hydroxym	118306	000067-47-0	70
			2-Furancarboxaldehyde, 5-(hydroxym	42014	000067-47-0	64
8	33.68	24.63	C:\DATABASE\NIST98.L			
			2-Amino-4-hydroxypteridine-6-carbo	10658	1000127-36-3	38
			Pyrido[3,4-d]imidazole, 1,6-bi[hyd	10596	1000126-42-1	23
			Amidephrine	10607	003354-67-4	23

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