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Study on Chemical Components of Ethanol Extractives of *Dipcadi serotinum* (Hyacinthaceae) By GC/MS

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KEYWORDS

Ethanol extractives, *Dipcadi serotinum*, Valorization, Wild flora

A B S T R A C T

The chemical components from ethanol extractives of fresh *Dipcadi serotinum* bulbs were separated and identified by GC/MS after liquid-liquid fractionating. Relative content of each component was determined by area normalization. We obtained three extracts: A (22 compounds), B (2 compounds) and C (3 compounds), which representing respectively 99.97%, 100% and 99.99% of the extractives were identified. The main and abundant constituents were Pentadecane, l Gala-l-ido-octose, Silane, Octadecane, 3,5,24-trimethyl-Tetracontane, permethylated and reduced product of degradation product from h3-glycolipid by α-L-fucosidase and by β-galactosidase; 1,1-dibutoxy-Butane, 4-diamine, 6-chloro-N-ethyl- 1,3,5-Triazine-2, and so on. The most components ethanol extractives of fresh *Dipcadi serotinum* bulbs are not only abundant, but the plant was traditionally used for its healing properties to combat the jaundice, and used as anti-inflammatory against insect bites.

Introduction

The family of the *Hyacinthaceae* is a family of monocotyledonous plants including between 500 and 1 000 species distributed into around fifty (40 to 70) of genres (Watson and Dallwitz, 1992). Previously, the plants of the family were consumed, but today they are recognized as fully toxic and carcinogenic. They contained same glycosides which are chemically related to digitalis, such as proscillaridine (A) who is an extremely active cardiac glycoside, but that appears extremely poorly absorbed from

the digestive (Sparg *et al.,* 2002). These plants also contained saponins and calcium oxalate crystals which have an irritant effect (Powell *et al.,* 1990).

The species serotinum Dipcadi, concerning our work, is quite commune in the coastal Atlantic region somewhat rarer in the north (near Tangiers) and South (region of Sidi Ifni). It grows either in the rocky places (preference for calcareous), or on the sands of the littoral.

It is encountered sometimes also in the central plains, where flowering comes later (Aafi *et al.,* 2005).

They are herbaceous plants perennials, colonizing rocky or sandy places, from 0-2400 m, encountered in Western Mediterranean (Morocco, France, Spain and Portugal), North Africa and Canary (APG, 2003; Botineau, 2010).

In Moroccan traditional medicines the species of the genera *Squill*, *Urginea* and even other *Liliaceae* like *Dipcadi* (*D. serotium L*, etc....) are considered warmer and involved at very low doses, mixed with a meal as warming up in treating colds, bronchitis, and influenza, etc…; They are also used in the treatment of jaundice, the bulbs of these plants are too prescribed as a diuretic and anti-inflammatory, the rat poison and insecticides properties are well known by the aboriginal population (Bellakhdar, 2006).

Materials and Methods

Materials

The plant studied was harvested in the region of *Tamaris* in December 2008. The ethanol used was chromatographic grade, was selected for the present experiment.

GC-MS analysis

The GC-MS analyses were carried out on Hewlett Packard 6890 coupled with MSD 5975 equipment (Hewlett Packard, Palo Alto, CA, USA) operating in EI mode at 70 eV. An HP-5 MS column (30 m x 0.25 mm x 0.25 mm) was used. The temperature program was: 100–180°C at 15°C x min^{-1}, 180-300°C at 5°C x min^{-1} and 10 min hold at 300°C. Injector temperature was 250°C. The flow rate of carrier gas (Helium) was 0.8 ml x min-1. A split ratio of 1:20 was used. A quantity of 1 µl of the solutions was injected.

Methods

At first, the bulbs of fresh plant were chopped and crushed in a death and later soaked in ethanol for 48 hours, after filtration and concentration, the ethanolic extract was separated by liquid-liquid fractionation, we obtained three fractions of which names are: A, B and C. The extractives solution was dried by anhydrous bitter salt, and then exposed to N_2 flow under air temperature, concentrated to 20 ml; finally 0.2µl solution was drawn out so as to be used for GC-MS analysis.

Results and Discussion

The total ion chromatogram of the ethanol extractives by GC/MS is shown in figures hereafter. Relative content of each component was counted by area normalization. Analyzing the MS data are performed by the CNRST standard MS map by computer, open-published books and papers.

The analysis shows that 22 peaks were obtained from extract A (Fig. 1) and octadecane which occupy 26.19% of the total were identified (Table 1).

It was also indicates than just 2 peaks were obtained from extract B (Fig. 2) and Pentadecane which occupy 90.44% of the total were identified (Table 2). Similarly, for the extract C the analysis shows that 3 peaks were obtained (Fig. 3) and the l-Gala-l-ido-octose which occupies 26.57% of the total areas was identified (Table 3).

Table.1 Analytical results ethanol extractives of fraction A wood by GC/MS

N°	Name	Area %
1	dichloromethyl ethyl sulfone	1.00
2	2-(dichloromethyl)-2-hydroxy-5-methyltetrahydrofuran	2.65
3	butane, 1,1-dibutoxy-	3.48
4	(2r,6r)-2-isopropyl-6-methyl-1,3-dioxane-4-one	7.87
5	2,2-dimethylpropionic acid, cyclopentyl ester	3.41
6	phosphonofluoridic acid, (1-methylethyl)-, cyclohexyl ester	1.39
7	cyclohexane, 1,1'-[1-(2,2-dimethylbutyl)-1,3-propanediyl] bis-	1.08
8	à-l-mannopyranoside, methyl 6-deoxy-2,4-di-o-methyl-, acetate	3.02
9	2-nitro-1-decen-4-yne	1.68
10	1, 3, 5-triazine-2,4-diamine, 6-chloro-n-ethyl-	9.73
11	2-acetoxy-1, 1, 10-trimethyl-6,9-epidioxydecalin	1.69
12	permethylated and reduced product of degradation product from h3-glycolipid by α-L-fucosidase and by β-galactosidase	1.82
13	octan-2-one, 3,6-dimethyl-	0.96
14	octadecane, 6-methyl-	0.95
15	13-tetradece-11-yn-1-ol	2.78
16	octadecane	26.19
19	dodecane, 2, 6, 10-trimethyl-	8.44
18	thiosulfuric acid (h2s2o3), s-(2-aminoethyl) ester	0.71
19	[1,1'-bicyclopropyl]-2-octanoic acid, 2'-hexyl-, methyl ester	4.08
20	l-gala-l-ido-octose	4.30
21	silane, [1-(5-hexenyl)-2-methylenecyclopropyl]trimethyl-	8.60
22	silane, (2-ethyl-5,5-dimethyl-4-methylene-1-cyclopenten-1-yl)trimethyl-	4.19

Table.2 Analytical results ethanol extractives of fraction B wood by GC/MS

N°	**Name**	Area %
1	Pentadecane (CAS)	90.44
2	Tetracontane, 3, 5, 24-trimethyl-	9.56

Table.3 Analytical results ethanol extractives of fraction C wood by GC/MS

N°	Name	Area %
1	1H-Cyclopenta[c]furan-3(3aH)-one, 6,6a dihydro-1-(1,3-dioxolan-2-yl)-, (3aR,1-trans,6a-cis)-	15.64
2	l-Gala-l-ido-octose	56.27
3	silane, [1-(5-hexenyl)-2 methylenecyclopropyl]trimethyl-	28.10

Fig.1 Total ion chromatogram of ethanol extractives of fraction A

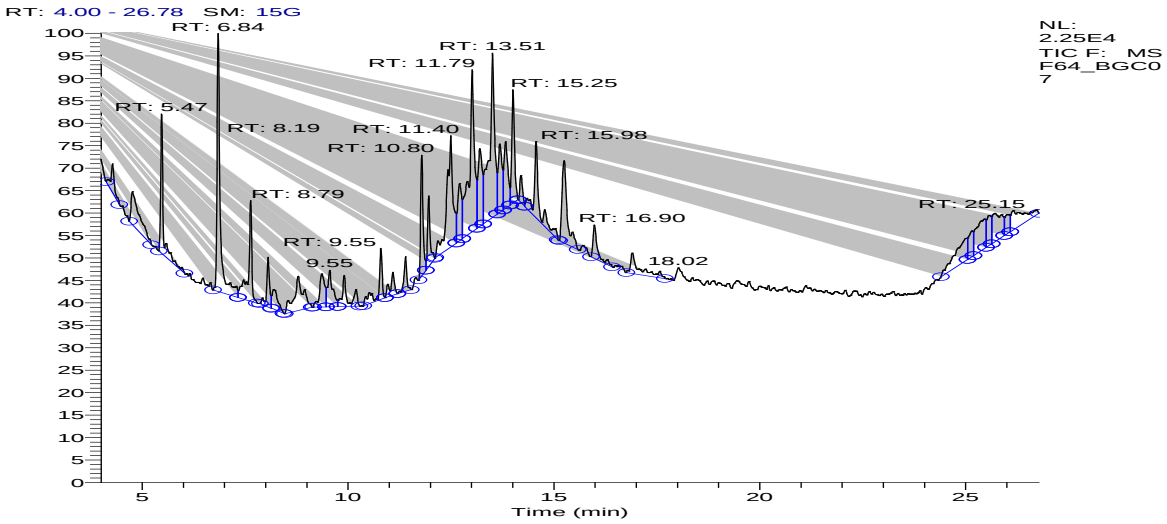


Fig.2 Total ion chromatogram of ethanol extractives of fraction B

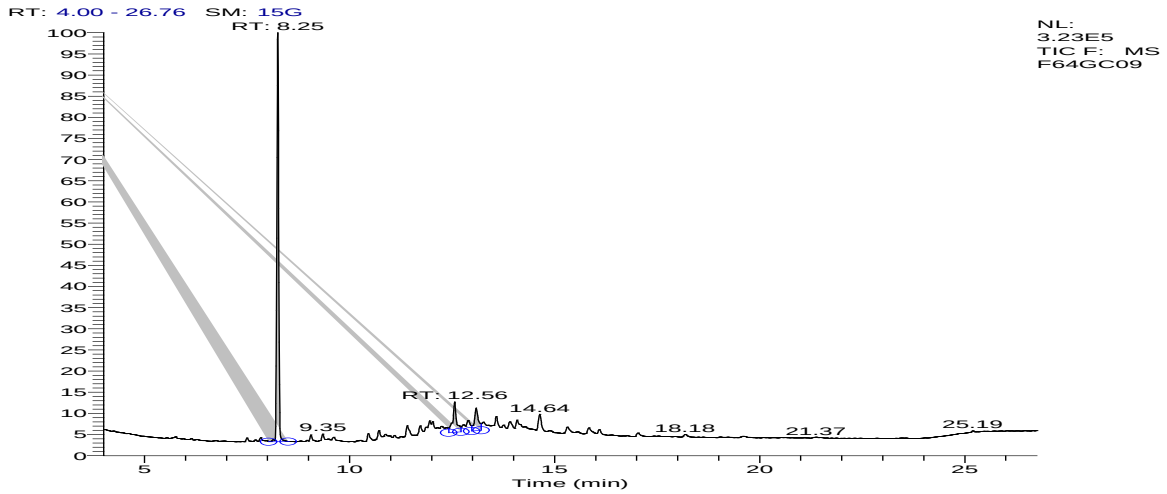
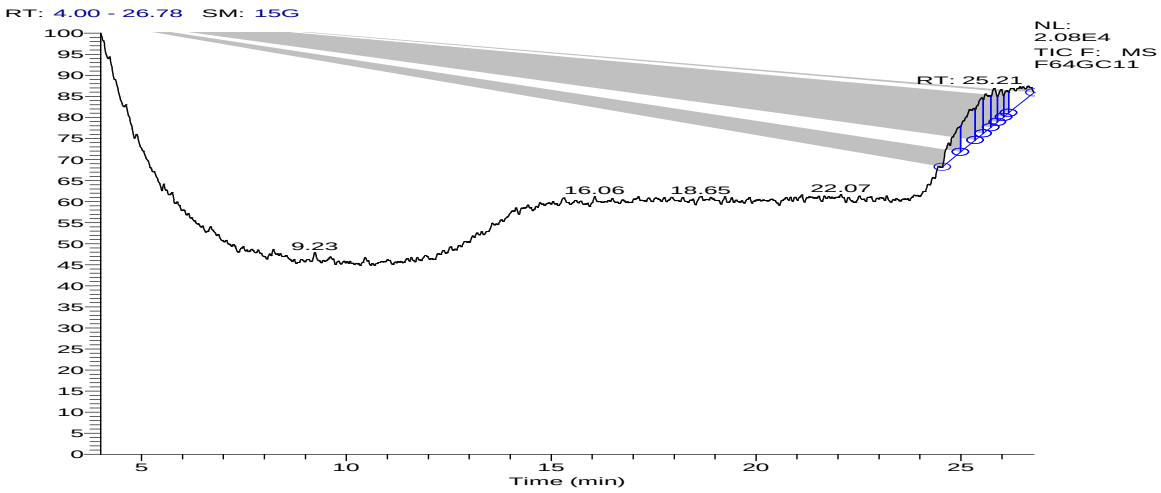


Fig.3 Total ion chromatogram of ethanol extractives of fraction C



Conclusion

As the first report here, the ethanol extractives of *Dipcadi serotinum* bulbs were proved to be high value added. Especially, the silane, several industrial and medical applications exist for the simplest silane (SiH_4) and functionalized silanes. For instance, silanes are used as coupling agents to adhere glass fibers to a polymer matrix, stabilizing the composite material. They can also be used to couple a bio-inert layer on a titanium implant. Other applications include water repellents, masonry protection, control of graffiti, applying polycrystalline silicon layers on silicon wafers when manufacturing semiconductors, and sealants. Silane (SiH_4) and similar compounds containing Si—H bonds are used as reducing agents in organic and organometallic chemistry (Chen, 2002).

The l-gala-l-ido-octose used for the synthesis of higher sugar higher sugar, necessary for the production of Drugs used to specifically facilitate learning or memory, particularly to prevent the cognitive deficits associated with dementias (Jun *et al.*, 2015). The permethylated and reduced product of degradation product from h3-glycolipid by α-L-fucosidase and by β-galactosidase these enzymes belongs to the family of hydrolases, specifically those glycosidases that hydrolyse O- and S-glycosyl compounds (Page and Di Cera 2008). And other consisting as saturated hydrocarbons, esters, acids and other compounds used in the food industry, pharmaceuticals, perfumes and other industrial sectors (Mann *et al.*, 1994).

Dipcadi serotinum bulbs possess many medicinal properties, which remains to be validated. Generally, the extractives of fresh *Dipcadi serotinum* bulbs are not only significantly but also high value-added medicine because it includes several therapeutic substances.

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