

Full Proceeding Paper

VOLATILE COMPOUNDS OF EGYPTIAN FRUITS OF *RUMEX VESICARIUS* L

EMAN A. ALAM

Al-Azhar University, Faculty of Science, Botany Department, Nasr City, Cairo, Egypt.
Email: Eg_flower2011@yahoo.com

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ABSTRACT

Objective: *Rumex vesicarius* is an important edible medicinal plant. This plant is a rich source of many important biologically active secondary metabolites. This work is performed to evaluate volatile compounds of ether extract of Egyptian fruits of this important plant.

Methods: GC analysis of ether extract of *Rumex vesicarius* was carried out in this work.

Results: Results of GC analysis of this ether extract revealed that, it contained 13 volatile compounds. The most dominant compound in this extract is Phenol,2,6-bis (1,1-dimethylethyl)-4-methyl-(CAS); Area % is 15.60, this compound is followed by Heptacosane; Area % is 10.23. This extract contained also a little amount of Caryophyllene; Area % is 1.98. 2H-Pyran, 2-(7-heptadecyloxy) tetrahydro- was found to be the least available compound in this extract; Area % is 1.51.

Conclusion: Ether extract of *Rumex vesicarius* can be considered as a rich source of many valuable volatile compounds.

Key words: *Rumex vesicarius* L., Ether extract, Volatile compounds.

INTRODUCTION

The genus *Rumex*, (family: Polygonaceae) comprises about 150 species, widely distributed around the World [1].

Rumex includes many edible plant species that have medicinal importance for the treatment of some most dangerous diseases [2, 3].

Rumex vesicarius L. is a wild edible plant used as a sorrel and collected in spring time and eaten fresh, or cooked. It was considered as a dietary complementary plant, since this plant is a rich source of β carotenes and many other important compounds [4].

The species has many important medicinal uses such as treatment of tumors, hepatic diseases, bad digestion, constipation, calculi, heart troubles, pains, diseases of the spleen, hiccup, flatulence, asthma, bronchitis, dyspepsia, piles, scabies, leucoderma, toothache and nausea. The plant is also used as antioxidant, cooling, laxative, stomachic, tonic, analgesic, appetizer, diuretic, astringent, purgative, antispasmodic, aphrodisiac and antibacterial agents. The roasted seeds were eaten for the cure of dysentery. Finally, the plant can be used also to reduce biliary disorders and control cholesterol levels. The medicinal importance of this plant is a reflection to its chemical composition, since this plant contains many bioactive substances such as flavonoids (vitexin, isovitexin, orientin and isorientin), anthraquinones particularly in roots (emodin and chrysophanol),

quinones, carotenoids, vitamins (especially vitamin C), proteins, lipids, carbohydrates, reducing sugars, phenols, tannins, saponins, triterpenoids, volatile compounds and organic acids. This plant is also a good source of minerals, such as; K, Na, Ca, Mg, Fe, Mn, Cu [5-8].

The previously mentioned bioactive phytochemicals found in *Rumex vesicarius* L. (such as volatile compounds, polyphenols, flavonoids, carotenoids, tocopherols and ascorbic acid) have a role as antimicrobial, antioxidant and detoxifying agents. The intake of these dietary antioxidant phytochemicals like carotenoids, phenolic compounds, volatile compounds and flavonoids will lead to the protection against noncommunicable diseases in human beings; cancer, cardiovascular diseases and cataract [9-10].

MATERIAL AND METHODS

Plant materials

Rumex vesicarius L. samples were collected during 2014, at the ripening fruiting stage (August) from 60 km away from Ain Sokhna, Quatamia- Ain Sokhna desert road, Egypt. Plant specimens were botanically identified and authenticated many times earlier by comparing with herbarium specimens, and the identified plant specimen was available in the plant herbarium of Botany and Microbiology Department, Faculty of science, Helwan University, Helwan, Egypt (Number: 1057).

Table 1: Volatile compounds of ether extract of Egyptian *Rumex vesicarius*.

RT	Molecular Weight	Molecular Formula	Compound Name	Area %
15.16	173	C ₅ H ₈ C ₁ N ₅	1,3,5-Triazine-2,4-diamine, 6-chloro-N-ethyl-(CAS)	1.64
26.02	204	C ₁₅ H ₂₄	Caryophyllene	1.98
28.91	220	C ₁₅ H ₂₄ O	Phenol,2,6-bis (1,1-dimethylethyl)-4-methyl-(CAS)	15.60
32.38	232	C ₁₇ H ₂₈	Benzene, (1-Butylheptyl)-	2.42
34.94	246	C ₁₈ H ₃₀	Benzene, (1-pentylheptyl)-	2.14
35.07	246	C ₁₈ H ₃₀	Benzene, (1-butyloctyl)-	2.12
37.50	336	C ₂₂ H ₄₀ O ₂	2H-Pyran, 2-(7-heptadecyloxy) tetrahydro-	1.51
40.99	290	C ₂₀ H ₃₄ O	2,4,7,14-Tetramethyl-4-vinyl-tricyclo[5.4.3.0 (1,8)]tetradecan-6-ol	3.37
43.95	0	N/A	Hahnfett	2.30
52.17	380	C ₂₇ H ₅₆	Heptacosane	10.23
55.84	380	C ₂₇ H ₅₆	Heptacosane (CAS)	8.67
57.58	450	C ₃₂ H ₆₆	Dotriacontane (CAS)	6.36
60.89	460	C ₂₇ H ₅₆ O ₅	Dimethoxyglycerol Docosyl Ether	3.33

Chemical analysis

Ether extract was obtained by soaking the dried fruits of the plant in HPLC-Grade ether (1/10 W/V) for 1 week, shaking well of samples during the extraction period was done. Volatile components of this extract were analyzed using GC (Gas Chromatography) instrument (Date of analysis: 08/17/14 04:52:40 PM, Scans: 18525, Libraries used in analysis are: Wiley9, mainlib and replib, Operator: ISQ120602, High Mass (m/z): 649.99335, Low mass (m/z): 40.00000, ISTD Amount: 0.000, Dilution Factor: 1.00, Run Time: 63 minutes, Sample Weight: 0.00) of the Central lab of National Research Centre, Giza, Egypt.

RESULTS

Results in Table.1 shows that, ether extract of Egyptian fruits of *Rumex vesicarius* contained 13 volatile compounds. The most dominant compound in this extract is Phenol,2,6-bis (1,1-dimethylethyl)-4-methyl-(CAS); Area % is 15.60, this compound is followed by Heptacosane; Area % is 10.23. This extract also contained also a little amount of Caryophyllene; Area % is 1.98. 2H-Pyran, 2-(7-heptadecyloxy) tetrahydro- was found to be the least predominant compound in this extract; Area % is 1.51.

DISCUSSION

The previously mentioned results are in parallel with other works [9-10].

CONFLICT OF INTERESTS

Declared None

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