

Reveleris® X2 Flash System

Reveleris® X2 Flash System Detects Critical Components, Eugenol and Caryophyllene, in Clove Oil Extract with High Purity

Introduction

Many plants contain “essential oils” extracted from them that have high boiling points and antibacterial properties.¹ The clove oil extracted from cloves is a rich source of eugenol and caryophyllene, both of which may contain medicinal properties. Besides its use in dentistry, it may be used for treating various health disorders such as indigestion, cough, headaches, and stress.

Extraction Conditions:

Extract Type: Oil

Flash Chromatography Conditions:

Cartridge: Reveleris® C18 media 12g

Solvent A: Water

Solvent B: Methanol

Flow Rate: 30mL/min

UV1 Wavelength: 254nm

UV2 Wavelength: 220nm

Cartridge Equilibration: 3.0 min

Injection Type: Liquid

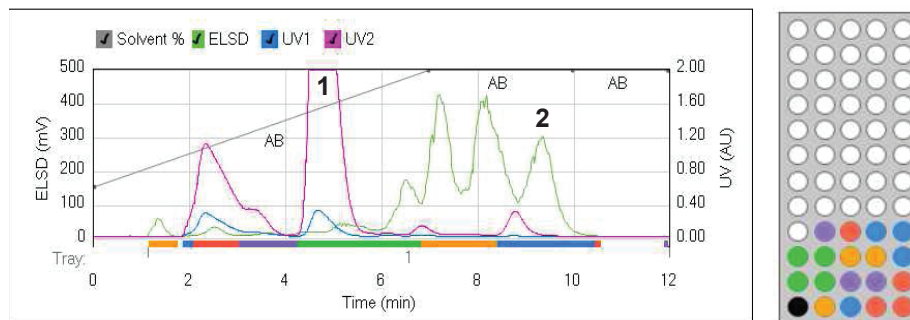
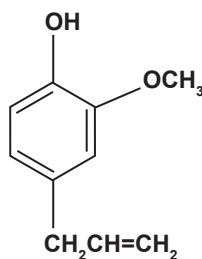


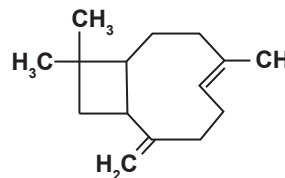
Figure 1: Purification of clove oil extract shows peaks detected with the Reveleris™ technology. Using the ELSD with UV allows for isolation of both chromophoric and non-chromophoric peaks in a single run.

Gradient Table

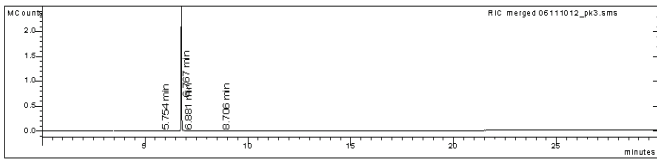
Step	Time (min.)	%B
1	0.0	30
2	7.0	100
3	3.0	100
4	2.0	100



1. Eugenol



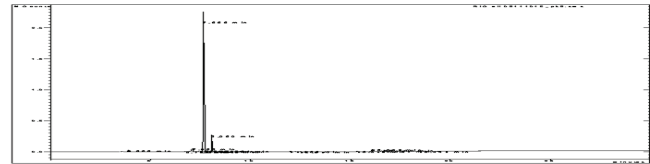
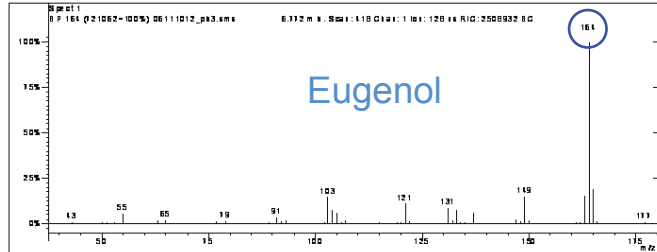
2. Caryophyllene



Target Compounds
None

Unidentified Peaks

Quan	RT	Compound Name	Status	Area	Amount	Match
1	5.754	No Match	Unk.	9576	0.179	0
2	6.767	Phenol, 2-methoxy-4-(1-prope	TIC	5297490	99.137	938
3	6.881	No Match	Unk.	7713	0.144	0
4	8.706	Phenol, 2-methoxy-4-(2-prope	TIC	28852	0.540	974



Target Compounds
None

Unidentified Peaks

Quan	RT	Compound Name	Status	Area	Amount	Match
1	3.658	Tetradecane §§ n-Tetradecane	TIC	56212	1.093	924
2	6.763	No Match	Unk.	11429	0.222	0
3	7.086	Copene §§ Tricyclo[4.4.0.0.2	TIC	92813	1.809	941
4	7.228	No Match	Unk.	3008	0.097	0
5	7.483	No Match	Unk.	9829	0.193	0
6	7.663	2-Isopropenyl-4a,8-dimethyl-	TIC	4203506	81.756	945
7	7.746	Caryophyllene §§ Bicyclo[7.2	TIC	16207	0.315	984
8	7.880	1R,3Z,9a-4,11,11-Trimethyl-8	TIC	19827	0.386	948
9	8.060	alpha-Caryophyllene §§ 1,4	TIC	466988	9.083	930
10	8.246	No Match	Unk.	8775	0.173	0
11	8.534	Naphthalene, 1,2,3,5,6,7,8,8	TIC	11492	0.224	935
12	8.784	Naphthalene, 1,2,3,5,6,8a-he	TIC	22589	0.439	944

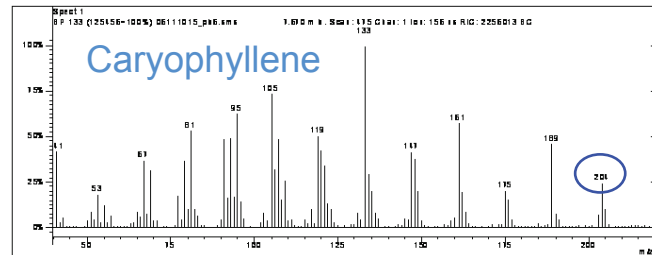


Figure 2: GC-MS analysis of the collected fractions of clove oil extract after flash chromatography identifies Eugenol (MW: 164) and Caryophyllene (MW: 204) with greater than 99% purity.

Conclusion

Natural product extracts have been shown to contain critical components that are both chromophoric and non-chromophoric. The Reveleris® flash chromatography system shows the benefits of RevealX™ technology in having multiple peak detection capability and integrated fraction collection for isolating compounds, helping to reduce post-run analysis time. The purification process can thus be more efficient and productive, even in the presence of low quantities of sample components.

References

- Bioactive Natural Products; Detection, Isolation, and Structural Determination, 2nd edition; Colegate, S. M.; Molyneux, R. J.; CRC Press, Boca Raton, Florida, 2008.

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W. R. Grace & Co.-Conn.
7500 Grace Drive, Columbia, MD 21044

Grace Discovery Sciences Regional Headquarters:

IN THE AMERICAS:
2051 Waukegan Road
Deerfield, IL 60015-1899
Tel: 1 847 948 8600
Email: discoverysciences@grace.com

IN EUROPE:
Brandstraat 12
B-9160 Lokeren, Belgium
Tel: +32 (0)9-340-65 65
Email: discoverysciences.EU@grace.com

IN ASIA:
19th Floor, K Wah Center
1010 Huaili Hai Zhong Road
Shanghai, 200031 PRC
Tel: 86 21 5467 4678
Email: dsbiz.asia@grace.com

IN INDIA:
17 Commerce Center
Opposite Krishna Hospital, Paud Road
Pune, 411038 India
Tel: +91 20 6644 9900
Email: pune@grace.com

IN AUSTRALIA:
2 Kerr Court
Rowville, 3178
Victoria, Australia
Tel: +61 3 9237 6100
Email: discoverysciences.AU@grace.com

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