

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

Reveleris® iES Flash Chromatography System

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.

Experimental

Extract Conditions

Extract type: Oil

Run Conditions

Cartridge: Reveleris® C18 media 12g

Flow rate: 30 mL/min

Equilibration: 3.0 min

UV1 wavelength: 254 nm

UV2 wavelength: 220 nm

ELSD carrier: Iso-proponal

Injection type: Liquid

Solvent A: Water

Solvent B: Methanol

Gradient Method

Step	Time (min.)	%B
1	0	30
2	7	100
3	3	100
4	2	100



Results and Discussion

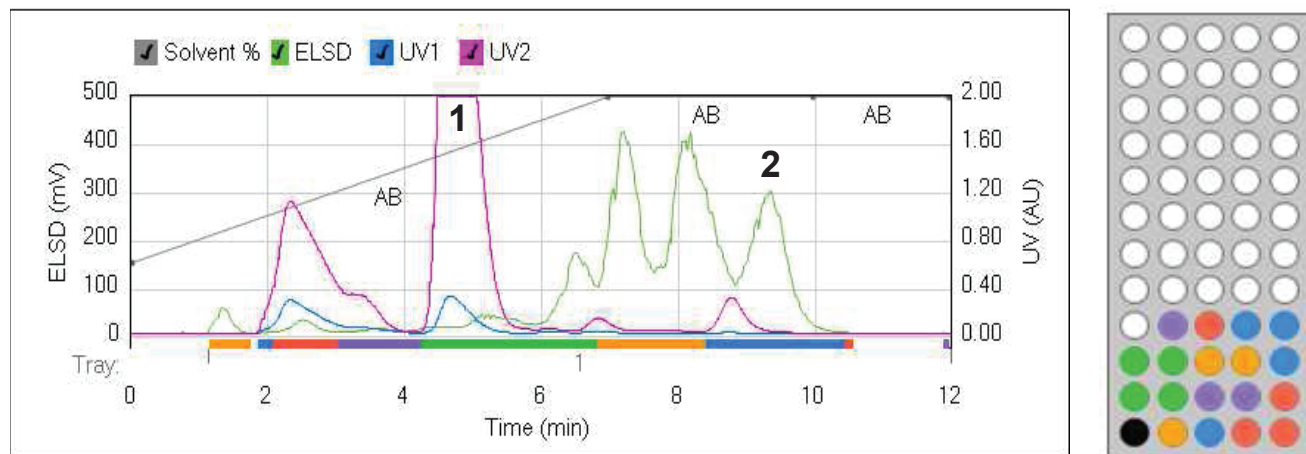
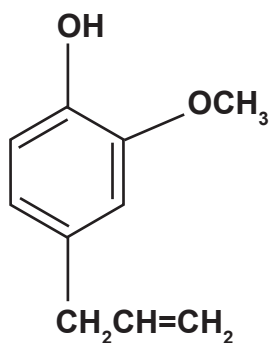
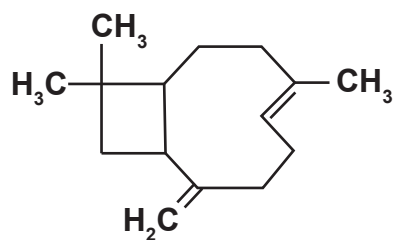


Figure 1: Purification of clove oil extract shows peaks detected with the RevealX™ technology. Using the ELSD with UV allows for isolation of both chromophoric and non-chromophoric peaks in a single run.



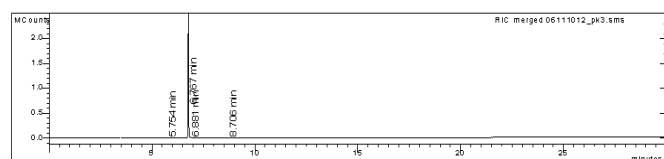
1. Eugenol



2. Caryophyllene



Results and Discussion

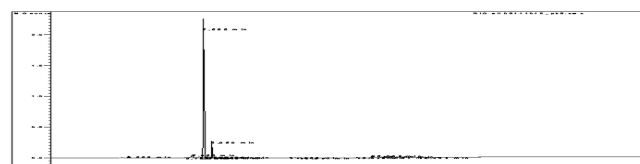
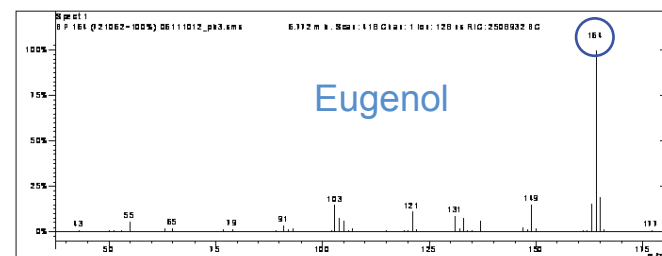


Target Compounds

None

Unidentified Peaks

Quan Ions:		Spectrum Match Type:		Purity	
RF Used:		Match Thresh:		700	
#	RT	Compound Name	Status	Area	Amount
1	5.754	No Match	Unk.	9576	0.129
2	6.767	Phenol, 2-methoxy-4-(1-prope	TIC	5297490	938
3	6.881	No Match	Unk.	7713	0.044
4	8.706	Phenol, 2-methoxy-4-(2-prope	TIC	28852	0.540



Target Compounds

None

Unidentified Peaks

Quan Ions:		Spectrum Match Type:		Purity	
RF Used:		Match Thresh:		700	
#	RT	Compound Name	Status	Area	Amount
1	3.858	Tetradecane && n-Tetradecane	TIC	56212	1.093
2	6.765	No Match	Unk.	11429	0.222
3	7.086	Copaene && Tricyclo[4.4.0.0.2	TIC	92813	1.805
4	7.228	No Match	Unk.	3008	0.097
5	7.483	No Match	Unk.	9829	0.191
6	7.663	2-Isopropenyl-4a,8-dimethyl-	TIC	4203506	81.756
7	7.745	Caryophyllene && Bicyclo[7.2	TIC	16207	0.315
8	7.880	1R,3R,8s-4,11,11-Trimethyl-8	TIC	19827	0.386
9	8.060	alpha-Caryophyllene && 1,4	TIC	466988	9.083
10	8.246	No Match	Unk.	8775	0.171
11	8.534	Naphthalene, 1,2,3,5,6,7,8,8	TIC	11492	0.224
12	8.784	Naphthalene, 1,2,3,5,6,8a-ha	TIC	22589	0.439

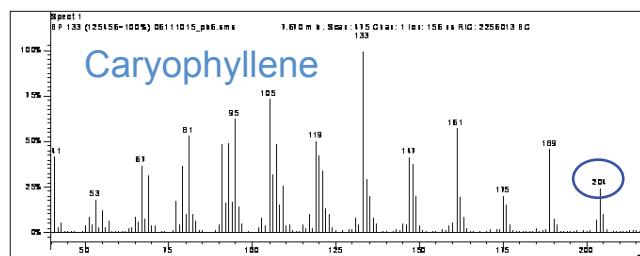


Figure 2: GC-MS analysis of the collected fractions of clove oil extract after flash chromatography identifies Eugenol (MW: 164) and Caryophyllene (MW: 204) with greater than 99% purity.

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

1. 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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