

SEPARATION OF CARYOPHYLLENE FROM CLOVE OIL AND ITS DETERMINATION BY GAS CHROMATOGRAPHY (GC-FID)

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Lobesia botrana - grapevine moth is widely recognized as one of the most destructive pests affecting grapevine yields and fruit quality. It is a well-known fact that insects are attracted to the volatile compounds of host plants - such as the grapevine - for purposes of feeding, reproduction, etc. One of these are blends of synthetic chemicals that mimic the natural scent of grapes or green leaves that attract insects for egg laying. Addition of this substances to sexual pheromones (which attract males exclusively), in traps for *Lobesia botrana* may increase capture efficiency, contributing to more efficient monitoring of this pest. Among the mixture of compounds found was caryophyllene. This natural compound is found in black pepper, cloves, cinnamon, rosemary, basil etc.

The objective was the extraction of clove oil, with quantitative determination via gas chromatography of caryophyllene, followed by its separation from the other compounds. The clove extract was obtained from cloves by maceration with hexane, followed by solvent evaporation. The cloves contain a large amount of eugenol which was washed away using a 2% basic solution. The organic part was separated and neutralized with an acid solution. A golden yellow oil was obtained with a yield of 2% relative to the amount of raw material used.

This was compared with a commercial caryophyllene standard on an Agilent 8860 chromatograph equipped with a non-polar capillary column. The chromatographic analysis shows that the extracted substance has the same retention time compared to commercial reference standard and appears as a well-defined and symmetrical peak at 14.8 min. Quantitative determination was performed using an external calibration curve with known concentrations of caryophyllene.

A concentration of 200 mg/L of caryophyllene was determined in the introduced sample, which was at the upper limit of the calibration curve, with excellent linearity - $R^2 = 0.99291$. The yield of caryophyllene obtained after separation from other compounds from clove oil being of 7%. The pure compound was added in mixed traps with the sex pheromone of *Lobesia botrana*, to determine whether a cumulative attraction effect exists in field tests compared to the standard pheromone

Keywords: *Lobesia botrana*, mixed traps, chromatographic analysis, caryophyllene, retention time.

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