

DETERMINATION OF β -CARYOPHYLLENE IN APPLE EXTRACT BY GC, USING A COMMERCIAL STANDARD

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β -Caryophyllene is a natural bicyclic sesquiterpene with the chemical formula $C_{15}H_{24}$, serving as a key volatile component in the aromatic profile of fruits, such as the peel and pulp of apples (*Malus domestica*). For pests like *Cydia pomonella*, this compound acts as a host-plant indicator, guiding them in feeding and oviposition processes, a property that makes it extremely valuable in the formulation of eco-friendly traps.

The purpose of this work consists in the optimization and application of a gas chromatography (GC) method for the quantitative determination of β -caryophyllene in apple extracts (*Golden Delicious*), specifically from the peel and pulp, using a commercial reference standard. The study aimed to validate the identity and concentration of this bioactive sesquiterpene to apply the method for dosing and monitoring its release from synthetic attractant traps used in the monitoring and trapping of the *Cydia pomonella* pest.

The apple peel and pulp extracts were prepared by hexane extraction, followed by filtration and vacuum concentration. Quantitative analysis of β -caryophyllene was performed by gas chromatography (GC, Agilent 8860 chromatograph), using a calibration curve based on an external commercial standard.

By optimizing the GC method, an excellent separation of β -caryophyllene was achieved, with the chromatographic peak being clearly defined, symmetric, and free from interferences from other matrix constituents. The identity of the compound in the extracts was confirmed by the perfect alignment of the retention time ($t_R = 14.8$ min) with that of the commercial reference standard.

The external calibration curve showed excellent linearity over the studied concentration range, with a statistical correlation coefficient $R^2 = 0.99291$.

The optimized GC method allowed the identification of a 238 mg/L concentration of β -caryophyllene in the studied apple extract. This value closely correlates with literature data (160–210 mg/L), slightly exceeding the reference range due to the efficiency of the applied extraction protocol.

The obtained results confirm the high application potential of this sesquiterpene-rich extract, which can be utilized for loading attractant traps against the *Cydia pomonella* pest.

Keywords: β -Caryophyllene, apple extract, gas chromatography, attractants, *Cydia pomonella*

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