



### K9 Exposure to Limonene: A Case Report

*Zeinab Mohamed Mostafa, BSc\*, Medicolegal Administration, Ministry of Justice, Egypt, Cairo, 002, EGYPT*

After attending this presentation, attendees will learn the relation between orange oil (Limonene) and respiratory failure.

This presentation will impact the forensic community by providing the relation between orange oil (Limonene) and respiratory failure.

D-limonene (4-Isopropenyl-1-methylcyclohexene) is the chemical name for orange oil. It's a renewable resource and is a by-product of

orange juice manufacturing. Orange oil is the oily substance found in the rinds of oranges. Orange oil is used in cleaning solutions, pet shampoos, soaps and perfumes. Limonene and its products are skin and respiratory irritants. Acute exposure to D-limonene has rarely been reported in deaths.

In this case report, we present a case of a previously healthy 30-year-old man who presented to the emergency department with acute respiratory failure. Non-toxicological causes were excluded. The purpose of this work was to demonstrate a toxicological cause of the respiratory failure and to recommend full toxicological screening for clinical and postmortem cases, especially those under suspicious circumstances.

A complete history was taken and a comprehensive clinical examination was performed. Toxicological analysis was performed. For the analysis of limonene in blood, gas chromatography/mass spectrometry (Shimadzu 2010) was utilized in the splitless mode of injection. The initial temperature was 170°C for 2 min. and then programmed at 16°C/min. to 270°C and held for 8 minutes.

The assay was found to be linear in the concentration range of 0.5- 20 ng/ml for limonene. Repeatability and intermediate precision were found to be less than 12% for all concentrations tested. Under standard chromatographic conditions the run cycle time would have been 13 minutes. By using fast chromatographic separation conditions, the assay analysis time could be reduced to 7 minutes without compromising the chromatographic resolution.

This developed procedure was also used to determine the limonene concentration levels for more than a hundred real forensic cases. The case was diagnosed as toxic exposure to limonene dissolved in organic solvent. The patient was exposed to limonene at home for many years in air fresheners. The patient survived after supportive treatment. The clinical and laboratory findings are discussed.

Limonene and its oxidation products are skin and respiratory irritants. Inhalation of these chemicals carries the risk of toxicity, which could be missed in diagnosis and hence treatment. This should encourage physicians working in emergency units to analysis for all available chemicals to avoid misdiagnosis.

**Forensic, Chemical, GC/MS**