

Determination And Quantification Of Organochlorine Pesticides In Soils Of Crops From The Department Of Córdoba.

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Abstract

In the present research work, organochlorine pesticides were determined and quantified in crop soils, whose sampling was carried out in an area of 10 farms in the department of Córdoba. To determine these chlorinated pollutants, a cleaning was carried out on the sample and the subsequent extraction of the pesticides present in them, extraction that was carried out with a primary standard (PCB-209), by the ultrasound method. Subsequently, it was completely dried with a stream of nitrogen and restored with a related solvent with an added standard, which is a solution that was made based on a mixture of OC's pesticides, among which were the following (HBC, Lindane, Metalochlor, 4,4'-DDT, 4,4'-DDE, Endrin) in order to quantify said components by means of Gas Chromatography coupled to the Mass Spectrophotometer (GC / MS), using as methodology of calibrated, adding standard (or standard).

Introduction

For several decades, a large part of the agricultural society worldwide has been knowing and making use of a varied amount of products or chemical agents destined to eradicate pests and microorganisms that threaten the quality of a harvested food or in more extreme cases, threaten the health of consumers, these products are what we know as pesticides. These caused such an impact in the eighties that they were even used to combat tropical diseases **1**. However, with the passage of time and its indiscriminate use, it was subsequently verified, due to its main characteristics as an exterminating agent, they caused irreparable damage due to its high toxicity and its ability to last over time **2**. Among these substances we find organochlorine pesticides (OC's), which are chlorinated pollutants, which were banned years ago and which to date are widely distributed in all environmental matrices, given their physicochemical properties, allowing their entry into the food chains and can bioaccumulate, which leads to generating public and environmental health problems such as carcinogenesis, immunological and reproductive disorders in living beings **3**.

Methodology

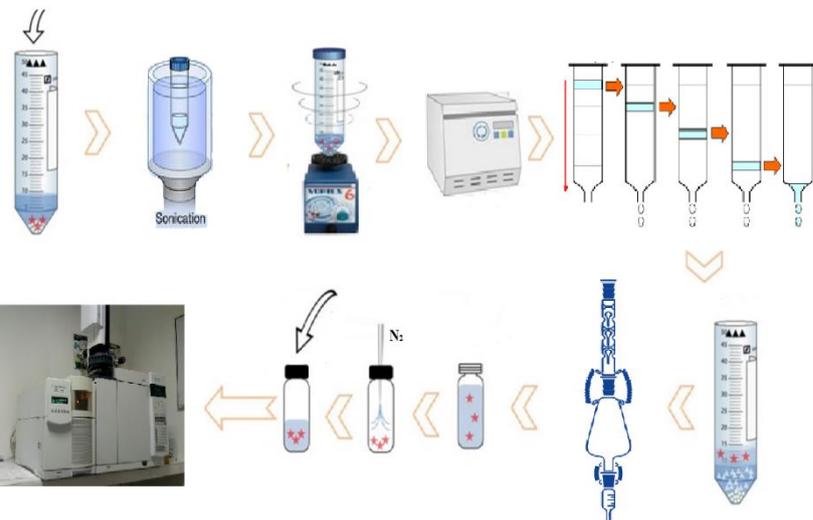


Figure 1. Methodological scheme for the extraction of pesticides

Analysis of results

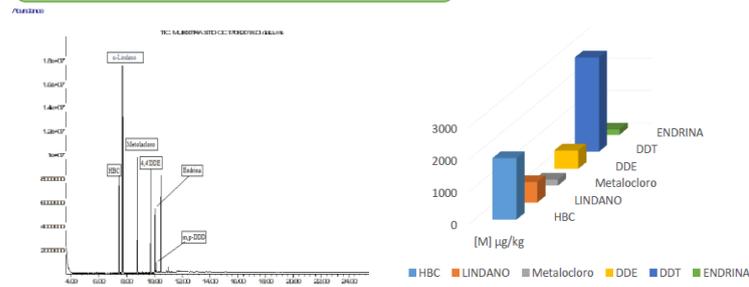


Image 1. Chromatogram of the mix standard

Image 2. Most reported concentrations

Table 1. concentrations of Organochlorine Pesticides in cultivation soils

[M] µg/kg	HBC	LINDANO	METALOCOLORO	4-4'-DDE	4-4'-DDT	ENDRINA
RT (min)	7,441	7,712	8,773	9,729	10,167	10,038
M1	26,587	6,945	0,967	15,831	N.D	N.D
M2	24,561	13,204	N.D	117,908	53,413	N.D
M3	14,832	14,832	4,354	17,345	N.D	N.D
M4	17,628	26,303	4,397	N.D	N.D	N.D
M5	1904,483	N.D	61,758	16,702	N.D	N.D
M6	11,189	N.D	N.D	N.D	N.D	N.D
M7	N.D	123,711	N.D	73,632	N.D	N.D
M8	20,042	N.D	12,046	13,779	2924,166	8,862
M9	30,48	33,586	47,433	N.D	12,16	N.D
M10	111,682	62,003	5,325	69,584	40,924	N.D
M11	47,544	65,306	183,394	N.D	N.D	3,671
M12	0,785	20,725	3,626	79,321	346,153	N.D
M13	35,073	202,75	2,394	83,292	N.D	1,42
M14	165,97	636,451	N.D	N.D	N.D	2,864
M15	104,547	8,062	N.D	80,502	N.D	167,563
M16	4,792	4,387	N.D	7,828	N.D	4,903
M17	34,482	4,978	69,5	9,815	53,026	17,838
M18	93,417	69,836	23,346	142,597	142,597	84,901
M19	149,347	11,484	N.D	568,205	480,313	137,941

Conclusions

The following pesticides were determined: HBC, Lindane, Metalochlor, Endrin, 4,4'-DDT, 4,4'-DDE, with high concentrations, despite its prohibition more than 20 years ago in Colombia, where the one that presented the most concentration was HBC and lindane respectively, with concentrations ranging from 4.79173 µg / Kg to much higher concentrations such as 165.970 µg / Kg (in the case of HBC), and 4.38792811 µg / Kg up to 123.71134 µg / Kg for lindane.

References

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