INTRODUCTION

The extraction of healthy compounds from fruit and vegetable waste makes these compounds organic, non-toxic and biocompatible together with the simultaneous use of the waste, thus reducing the risks of waste accumulation in the environment. Therefore, the treatment of fruit waste through different techniques such as landfilling or incineration can be avoided to prevent the negative effect on the environment, as well as the cost of investment in the process. The extraction of value-added products from organic waste produces by-products that are used as main ingredients for other production processes. Research carried out by the CTIC and scientific publications have shown that the residue obtained after the extraction processes of compounds of interest such as proteins, vitamins, pigments and phenolic compounds, can be used to adsorb different types of pesticides and heavy metals such as nickel, cadmium, arsenic, chromium, etc. from polluted water due to the surface properties of the residues.

This project aims to develop technologies for the removal of toxic compounds (pesticides) from natural extracts using low-cost adsorbents, without decreasing the concentration of the compounds of interest as a result of the adsorption process.

METHODOLOGY

Different natural adsorbent materials have been obtained from agricultural and food industry residues, capable of retaining pesticides and toxic compounds in their pores. For this purpose, they have been subjected to homogenization processes by crushing and sieving, with the aim of reducing the size and increasing the contact surface available for the adsorption of pollutants. In addition, the organic compounds, which produce the degradation of the biomaterial, have been reduced through the application of successive washes and the use of oxidation steps.

Different batches of artichoke and citrus extracts, containing pesticides, will be treated with the natural adsorbents obtained to obtain contaminant-free extracts. The methodology to be followed is shown in figure 1.

RESULTS AND DISCUSSIONS

Two natural adsorbent materials have been obtained from the residues almond peel (picture 3) and rice husk (picture 4) in the methodology applied for the activation of the materials was application of physical, chemical, thermal treatments. Table 1 shows the characterization of natural adsorbent materials. Figure 2 shows the % of pesticide reduction in contaminated water after the treatment with activated almond and rice adsorbent.

A citrus extract (picture 5) and artichoke extract (picture 6) were produced as control samples. Table 4 shows the characterization of citrus by-product and control extract. Table 5 shows the characterization of artichoke by-product. The characterization of the artichoke control extract is on going.

CONCLUSIONS

DIFFERENT NATURAL ADSORBENTS HAVE BEEN OBTAINED FROM BY-PRODUCTS OF THE FOOD INDUSTRY.

THE COMPARATIVE OF PESTICIDE REMOVAL BY ADSORPTION PROCESSES WITH NATURAL ADSORBENTS MADE FROM ALMOND PEELED RICE HUSK AND WITH COMMERCIAL ADSORBENT MATERIALS GAC AND ZEOLOITE IS BEING STUDIED.

THE DEVELOPMENT OF CONTAMINANT-FREE ARTICHOKE AND CITRUS EXTRACTS IS UNDERWAY.

REFERENCES