

Asha Oroskar, Xuejun Zang, Orochem Technologies Inc., 340 Shuman Blvd, Naperville IL 60563
 Tergel Erdenebat*, University of Illinois, Urbana-Champaign
 Calin Dumitrescu*, University of Wisconsin, Madison
 Shaunik Kapoor*, Naperville North High School

Introduction

The QuEChERS method has been utilized to detect pesticides in final products and to screen incoming fruits, vegetables, feedstocks and nutraceutical ingredients to qualify (overseas) suppliers or ingredients as organic. The main purpose of this study is to make a QuEChERS formula that can clean up unwanted contaminants and excess water to purify the analytes for better recovery.

Several different QuEChERS formulations have been tested with seven different pesticides in different matrices. Some typical compounds were chosen, such as carbamate insecticides (carbaryl, oxamyl), chloronicotinyl (imidacloprid), phenylurea (monuron, diuron), postemergence selective herbicides (propazine, atrazine). The best QuEChERS formulation was determined by asking four main questions: does it work with different matrices, have higher and consistent recovery of analytes, have high color-pigment removal, and does it absorb everything but analytes for the clean-up.

Instruments and Materials

Instruments: Centrifuge and vortexer. All LC-MS/MS methods used a Shimadzu LC system coupled to an API 3000 mass spectrometer with a turbo ionspray ESI source operated in positive ion mode

Materials: Orochem specialty QuEChERS tubes for stevia and hemp (Orochem Technologies Inc) were used for all extractions. Seven pesticides (carbaryl, oxamyl, imidacloprid, monuron, diuron, propazine) and NaCl were purchased from Sigma-Aldrich. Mass spec grade methanol, acetonitrile, water and formic acid (FA) were purchased from Pharmco-Aaper.

Experiments

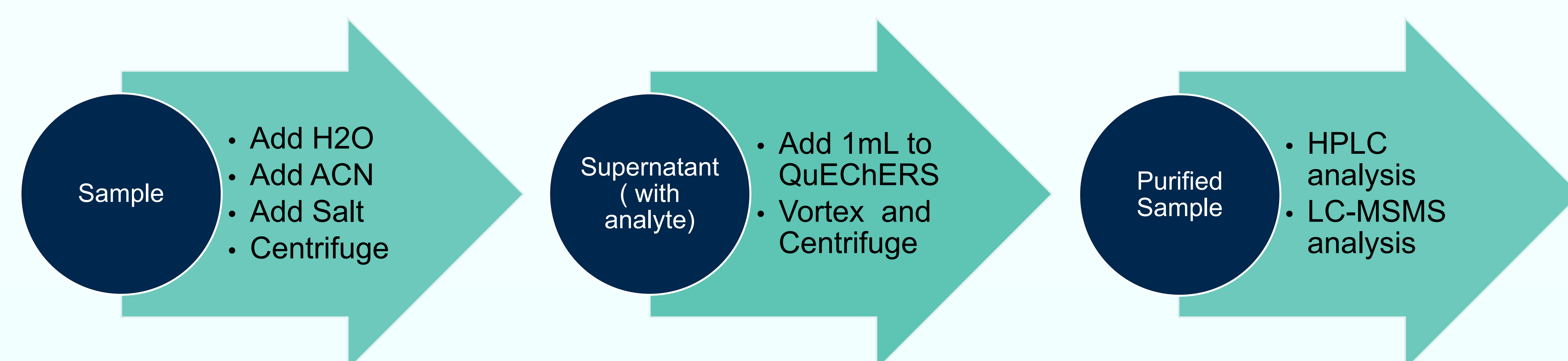


Figure 1. Standard AOAC procedures were used for pigment removal test.

For Pesticides recovery test in stevia and hemp leaves

- 5 g of sample fortified with pesticides was mixed with 20 mL of various solvents each in centrifuge tube. Vortex 30 sec, centrifuge 2500 rpm for 5 min
- 1 mL of supernatant to different QuChERS composition tube, vortex 30 sec, centrifuge 2500 rpm for 5 min.

HPLC-MS/MS Conditions:

Column: Orochem Orosil C18 UHPLC column 4.6x250 mm, 3 μm.

Mobile phase: gradient 35% -85% acetonitrile in 16 min

Mass spectrometer: API 3000, ESI+

