Title Liquid chromatography-negative ion electrospray mass spectrometry detection of maleic anhydride-modified wood rosin for assessing quality of commercial citrus fruit coatings

Author Giacomo Gagliano, Maria Gargano, Pietro Pagano, Leonardo Sabatino, Monica Scordino and Pasqualino Traulo

Citation European Food Research and Technology, 226, Number 5, 991-999, 2008

Keywords Abietic acid; Colophony; Diels; Alder adduct; Maleic anhydride; Maleopimaric acid; Wax

Abstract

Differently from Europe (EU), in United States (US) is allowed the use of citrus coating formulations containing pentaerythritol-ester of maleic anhydride-modified wood rosin, imputed of allergenic effects. To control the waxes used in the European citrus coating operations, a reliable LC/PDA/ESI–MS method for the simultaneous detection of abietic acid (AA) and maleopimaric acid (MPA) was developed. AA is the main resin acid, while MPA is the major product of the modification of rosin with maleic anhydride. Because of the lack of commercial standard, the MPA was synthesized in our laboratory heating AA and maleic anhydride together at 190 °C. The method was successfully applied to 190 samples of coated citrus fruits and 19 commercial waxes collected in the Italian market. The results demonstrated that about 7.5% of the investigated citrus samples contained both AA and MPA, evidencing the illicit employ of unpermitted waxes in citrus coatings. All the analyzed waxes resulted instead regular. The proposed method could be routinely applied in the control laboratories to assess quality of European citrus fruit, preserving the consumers from the commercial illicit and from potential toxicological consequences.