Simultaneous determination of nine high-intensity sweeteners in sweeties from the Brazilian market

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A method was established for the simultaneous determination of nine high-intensity sweeteners (HIS) in sweeties like jellies, puddings, jams and candies. Briefly, the samples were diluted in water, filtered and analyzed using ultra-high performance liquid chromatography coupled to tandem mass spectrometry to determine acesulfame potassium, sucralose, aspartame, rebaudioside A, neotame, saccharin, sodium cyclamate, stevioside and advantame. The chromatographic separation was achieved in an analytical column Poroshell C18 (2.1 x 50mm, 2.7µm) maintained at 40 ºC. A ternary mobile phase consisted of formic acid solution 0.1% (A) and acetronitrile:methanol 1:1 (v/v) acidified with 0.1% of formic acid (B) in gradient mode elution. The analytical method was validated and applied in 40 commercial samples of sweeties with partial or total sugar reduction, including two different batches of each product. For the analytes, except sucralose, the precision and accuracy were determined at the levels of 20 ng/mL (low), 100 ng/mL (middle) and 400 ng/mL (high). Precision (RSD%) was lower than 11.95% and accuracy was between 70.4% and 109.86%. For sucralose, precision and accuracy were determined at 200 ng/mL (low), 400 ng/mL (middle) and 600 ng/mL (high). Precision (RSD%) was lower than 14.88% and accuracy was between 72.16% and 119.28%. For the analyzed samples, it was observed the presence of at least one and at most four HIS in the formulations, with different concentrations for the different brands. For acesulfame, the concentration ranged from 1.30 to 71.69 mg/100g, for the saccharin from 1.04 to 25.67 mg/100g, sodium cyclamate from 1.53 to 39.72 mg/100g, sucralose from 1.11 to 100.18 mg/100g, aspartame from 1.27 to 457.45 mg/100g, stevioside from 1.95 to 6.18 mg/100g and rebaudioside A from 2.18 to 4.84 mg/100g. All samples tested showed levels within the limits allowed by Brazilian legislation. FUNDING: São Paulo Research Foundation (FAPESP) [Grant number 2021/02387-6] and Brazilian Federal Agency for Support and Evaluation of Graduate Education (CAPES) [Finance code 001] .