PHYSICOCHEMICAL AND SENSORY CHARACTERIZATION OF HONEY AND ITS ADULTERANTS

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ABSTRACT

The honey market in Bosnia and Herzegovina faces significant challenges regarding product authenticity and quality control. The lack of a well-regulated inspection system, combined with limited consumer awareness, creates favorable conditions for the distribution of adulterated products. This study examined 25 samples in total: 10 honey samples within their declared shelf life, 7 samples older than three years, 3 commercially available samples suspected of adulteration, and 5 laboratory-prepared adulterants consisting of inverted sugar syrups with varying proportions of honey and tartaric acid. Physicochemical analysis included determination of sugar content, ash content, water content, total acidity, hydroxymethylfurfural (HMF) concentration, and electrical conductivity, conducted in accordance with applicable regulations. Sensory evaluation was performed using descriptive testing methods by trained assessors. Only four of the ten samples within shelf life were in accordance with all chemical parameters, while the remaining six exhibited elevated HMF values, excessive moisture, or increased acidity. All samples older than three years showed markedly elevated HMF content (174–1478 mg/kg). Two of the three suspected commercial samples were confirmed as adulterated by chemical analysis, and none passed sensory evaluation. All laboratory adulterants failed chemical testing, while sensory evaluation identified them as adulterated in only 55% of cases. Overall, two-thirds of declared honey samples were sensorily accepted, while fewer than half were chemically correct. The findings demonstrate that current prescribed analytical methods are insufficient to guarantee honey authenticity, and the introduction of additional detection methods along with stricter market surveillance is strongly recommended.

Keywords: honey, adulteration, quality control, physicochemical analysis, sensory evaluation.