METHODS OF FALSIFYCATION AND DETERMINATION OF UNCERTAINTY HONEY

O. Fediakova, S. Kislova, O. Pazders`ka

State Scientific-research Control Institute of Veterinary Medicinal Products and Feeds Additives
11, Donetska str., Lviv, 79019, Ukraine

Honey is the natural product obtained by honey bees (Apis mellifera L.) from the nectar of flowers or from secretions of other living parts of the plants or excretions of sucker insects.

The composition and properties of honey depend on the botanical origin of the nectars or secretions. Honey is composed of sugar (42-75%), water (15-20%) and other ingredients that make up about 6%. Sugar gives the main characteristics of honey, water folows (the liquid), and components that are found in small quantities determine the differences between various types of honey. These differences are the color, aroma and taste.

Sugar in honey is not a single species, but consists of three kinds of sugar. These are the fruit sugar (fructose), which has among the highest (21.7-53.9%), grape sugar (glucose), which has 20.4-44.4% of ordinary sugar (sucrose) which is between 1 and 2%. The ratio of one type of sugar to other depends of the source, ie flower pasture, and to some extent on enzyme invertase, which breaks down regular sugar in grape and fruit. This enzyme is located in the flower from which the bees collect nectar, but it is also present in the bees body.

The other ingredients include: minerals, proteins, acids and undetermined matter. The ratio of these components varies from one type of honey to another.

Vitamins in honey has a very modest quantities, insufficient for the needs of the organism (vitamin C and some B complex vitamins riboflavin, pantothenic acid, pyridoxine, biotin, nicotinic acid).

Proteins come in honey from nectar and pollen as a integral parts of plants. Proteins in honey may be in the form of a very complex structure or in the form of simple compounds, amino acids.

Essential oils give the characteristic aroma of honey. These substances are very unstable and quickly evaporates by heating honey.

In recent years, the general drop in production and the consequent increase in market prices have encouraged falsification practices, through the intentional addition

of inexpensive sugar syrup to honey, and have made honey adulteration particularly attractive. This falsification/adulteration procedure is often difficult to detect, owing to the fact that the sugar compositions of these low-cost syrups were sometimes close to those of authentic honey. In the literature, several methods were proposed to detect honey adulteration through sugar profile analysis.

The publication analyzes the scientific literature on the chemical composition of honey, describes the types of honey (artificial and natural, monophlor and poly flora). The data on methods of falsification and methods of its detection are presented

Each year the volumes of export lots of honey are increasing. Exports of honey already in 2017 amounted to almost 57 tons, and today Ukraine exports honey to 35 countries and. The increased demand for honey provokes attempts to increase its quantity due to various falsifications. The chemical composition of honey is inconsistent, so it is very difficult to control its contents and detect a fake. The discrepancy of the results of the analysis with the norms of Ukraine documentation 4497: 2005 ("Honey natural" valid from 01.01.2007) may indicate falsification by substituting artificial or partial mixing of low-quality honey.

Keywords: HONEY, FALSIFICATION, QUANTITATIVE ANALYSIS, SUGARS, DIASTASE, PROLIN, HIDROXIMRTHYLFURFUROL, ARTIFICIAL HONEY, HONEY.