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Research concerning the Influence of the Use of Energo-Protein Supplements-Eco Certificate upon Physical-Chemical Honey Indicators

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Abstract

Numerical growth of global population, technical-scientific and socio-economical evolution determinate the increase of food need and diversification. In these conditions, beekeeping acquires an increasingly important role as food providers, but also as a vehicle to boost production by pollinating entomophilous cultures. Thus, the aim of present work is to highlight the influence of the use of energo-proteic supplements eco certificated represented by honey with added 10% rape pollen, sunflower, linden and trees upon some physical-chemical parameters of acacia, linden and rape honey. The analyzes performed show that water in honey samples was within the recommended range for a high quality honey. Whatever the energo-protein supplement used hydroxymethylfurfural content presented to all the variants analyzed values below 1 mg/100 g of honey. Colorimetric index value of honey was framed in recommended high quality standards, the results obtained were below the maximum limits for each type of honey, and the protein supplements administrated to bee families had no influence. Regarding the content of glucose and fructose in honey samples, acacia honey had the highest amount of fructose compared to linden honey or rape honey, and the ratio of fructose and glucose ranged between 1.34-1.43. It can be concluded that the physical-chemical parameters analyzed in all three varieties of honey were located within the limits recommended by the European Commission and Codex Alimentarius, whatever the energo-proteic supplement used.

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1. Introduction

The technological and nutritional properties of different food ingredients are highly influenced by processing conditions. Organic beekeeping requires, in addition to the mandatory rules of good practice for conventional beekeeping, a series of new production methods in order to acquire the qualifications of organic production methods. The goal of organic beekeeping is to achieve a clean, non-polluted product, meeting modern standards of environmental protection and sustainable development.

Natural honey producers are obliged to ensure the implementation of good practices, in order to obtain quality products that meet food security standards in order to get the organic label as issued under the Codex Alimentarius. Food quality and safety of bee products should be ensured by applying quality management systems and production methods that mitigate potential health risks and provide information to ensure product traceability. Honey composition varies depending on floral origin, the climate, environmental and seasonal conditions, as well as agricultural practices (Azeredo et al, 2003). Aim of the study was highlighting it obtained under organic honey quality by establishing chemical indicators represent by humidity, hydroxymethylfurfural (HMF), colorimetric index, glucose and fructose.

2. Materials and methods

2.1. Materials

The biological research material was represented by 25 bee colonies comparable in terms of the number and age of bees. Fall food reserves were the bee bread and honey and queen bees came from own apiary.

The bees were distributed in 5 uniform groups: a control and four experimental groups. Energo supplements administrated to the control group consisted of 12 kg honey (6 kg autumn + 6 kg spring), the experimental groups received energo-protein supplements represented by 12 kg honey and 1.2 kg pollen of various origins (Rape pollen-experimental group 1, sunflower pollen- experimental group 2, linden pollen-experimental group 3, pollen from trees- experimental group 4) (Table 1). Pollen was harvested in the spring and summer of previous year, dried and stored in special containers until the preparation mixture.

Table 1. Experimental Scheme

Group	n	Treatment	Period	Objectives
Control group	5	Honey		
Experimental Group 1	5	Honey+10% rape pollen	1-30 september	chemical determinations for quality analysis of honey (humidity, HMF, colorimetric index, glucose and fructose)
Experimental Group 2	5	Honey+10% sunflower pollen	22 february-30 march	
Experimental Group 3	5	Honey+10% Linden pollen		
Experimental Group 4	5	Honey+10% trees pollen		

Analysis methods used were consistent with quality standards in force and had as reference standard SR 784-3: 2009.

Water determination was made using the refractometer method. The colorimetric index was determined by reading colorimeter Hanna.

Determination of hydroxymethylfurfural (HMF) was made using Winkler s method, based on the reaction with barbituric acid in the presence of p-toluidine.

Determination of reducing sugar (glucose + fructose) was made using the method Elser. To analyze the glucose content of honey, method Auerbach and Bodlander was used, and the fructose was calculated by the difference between reducing sugar and glucose honey content. The statistical interpretation of results obtained in order to determine the significance of differences between calculated variants was performed using Fisher test

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