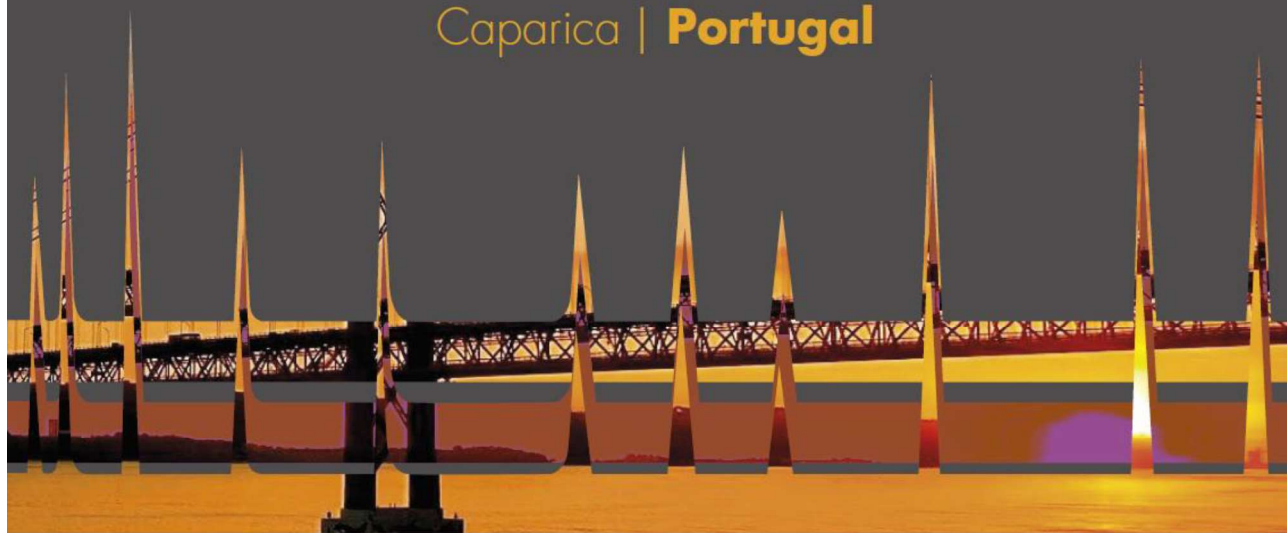


11^o CONGRESSO
NACIONAL
DE **CROMATOGRAFIA**

20 anos
CROMATOGRAFIA

11th NATIONAL MEETING ON CHROMATOGRAPHY

9 | 11 Dezembro 2019
Caparica | **Portugal**



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P48 Sugar profile of honey by ion chromatography

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Honey is a sweet food product mainly composed of carbohydrates (60-80 %), lower amounts of water and a great number of minor components. Fructose and glucose are the main sugars in honey. Furthermore, it is possible to find more than 20 different oligosaccharides.

The aim of this work is to evaluate the possibility of distinguishing three types of honey by their sugar profiles.

The sugar content and profile (trehalose, arabinose, glucose, fructose, sucrose, maltulose, melezitose, maltose, turanose and erlose) were evaluated of three groups of honey samples commercially classified as *Castanea sativa* honey (10 samples), honeydew honey (6 samples) and *Rubus* honey (3 samples) from Spain.

Pollen analysis was carried out using the method recommended by the International Commission of Bee Botany (ICBB).¹ Qualitative analysis was conducted by examining each of the preparations under the optical microscope (Nikon Eclipse 80 i) at 400 and 1000 magnification. An average of 650 pollen grains in each honey sample were identified using various keys and literature^{2,3,4} and the pollen data base of Department of Biodiversity and Environmental Management of the University of León.

The honey's sugar content was analysed in Dionex[®] ICS3000™ ion chromatograph.⁵ Separation was performed in a column "CarboPac™ PA20 3x150mm" with a precolumn "CarboPac™ PA20 3x30mm". Electrochemical detector in Integrated Pulsed Amperometric Detection (IPAD) mode was used. The elution was performed with a gradient with two NaOH solutions (15 and 200 mM). Standard solutions were used to identify and quantify the individual sugar components. All analyses were carried out in duplicate.

Concerning the principal component analysis made with different sugar content and the percentage of the pollen (higher than 10%) the *Rubus* honey samples are very well separated from the other samples and are characterized by higher content in maltose and the absence of melezitose. Comparing the *Castanea sativa* monofloral honey and honeydew honey, the more relevant differences are observed in the contents of melezitose, maltulose and trehalose. Overall the melezitose is almost null for *Castanea sativa* monofloral honey, whereas for honeydew honey maltulose is 32% lower and trehalose is 21% higher than in the floral honey.

Keywords: *Castanea*, honey, pollen analysis, *Rubus*, sugar.

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Sugar profile of honey by ion chromatography



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Honey is a sweet food product mainly composed of carbohydrates (60-80 %), lower amounts of water and a great diversity of minor components. Fructose and glucose are the main sugars in honey, yet it is possible to identify more than 20 different oligosaccharides

Aim The aim of this work is to evaluate the possibility of distinguishing three types of honey by their sugar profiles.

Samples

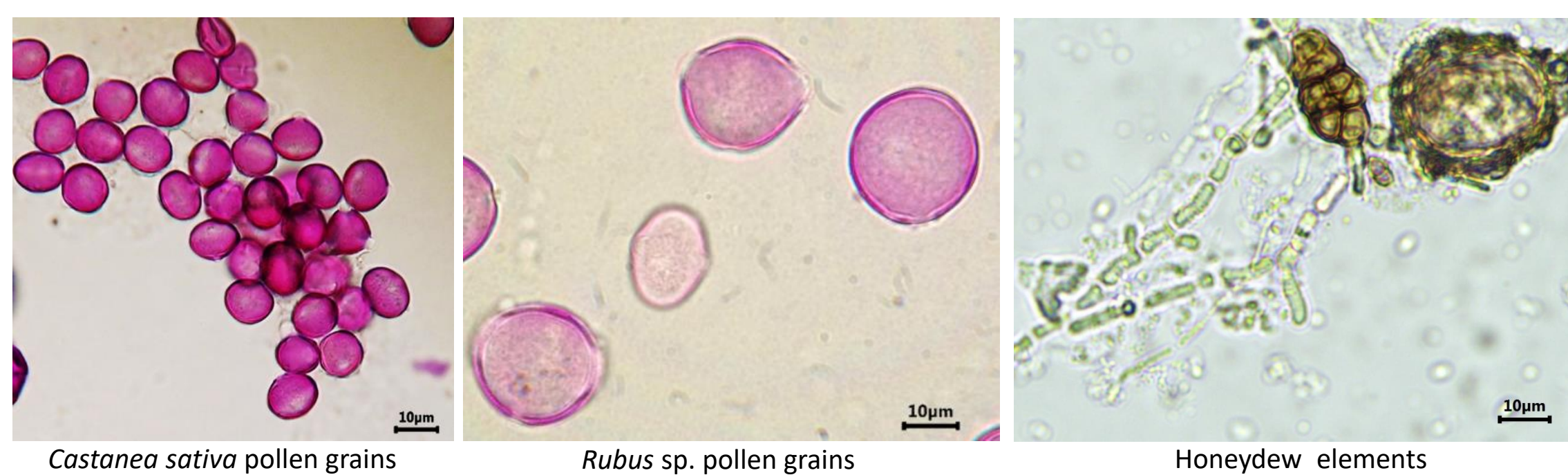
Three groups of honey samples commercially classified as *Castanea sativa* honey (10 samples), honeydew honey (6 samples) and *Rubus* honey (3 samples) from Spain were evaluated.



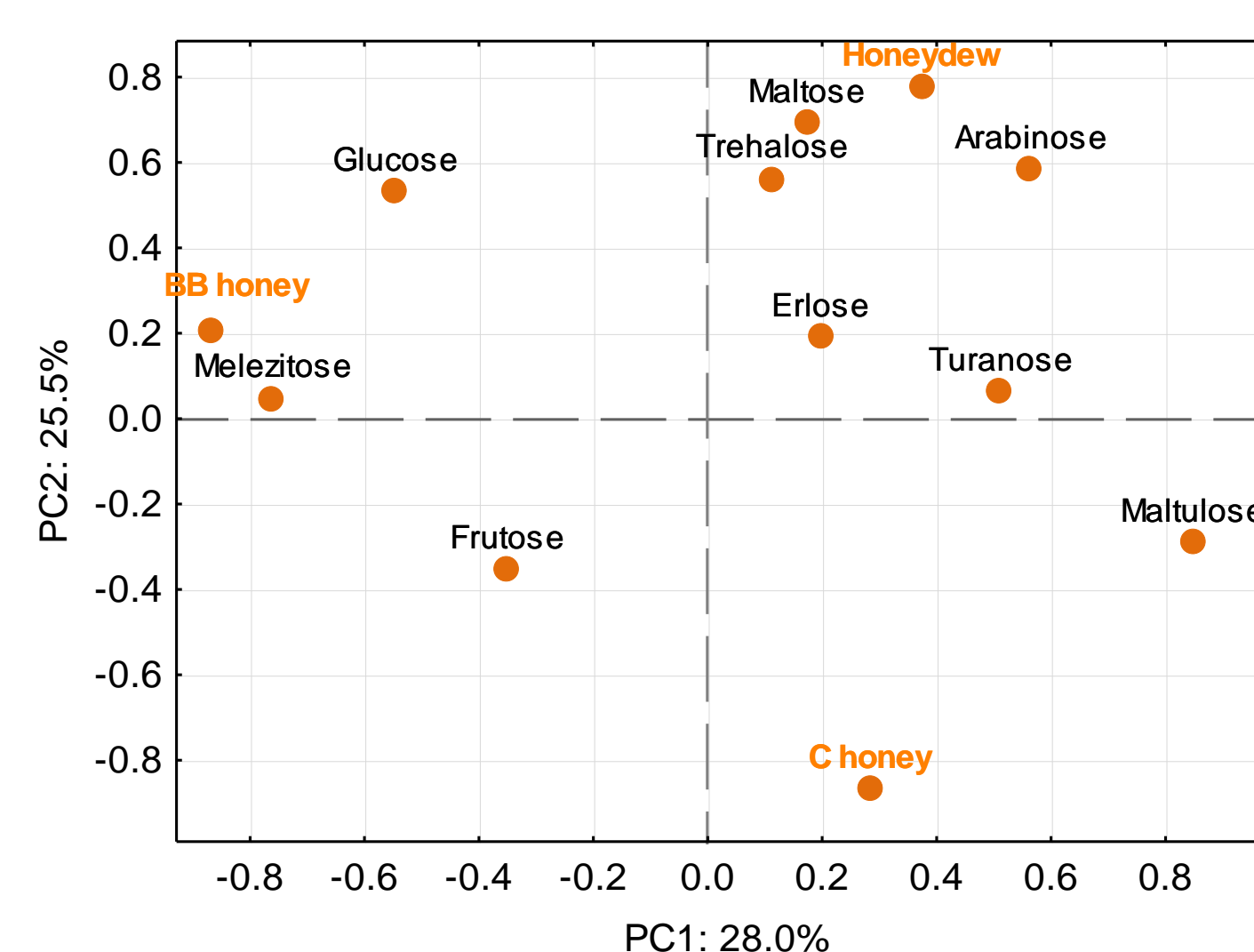
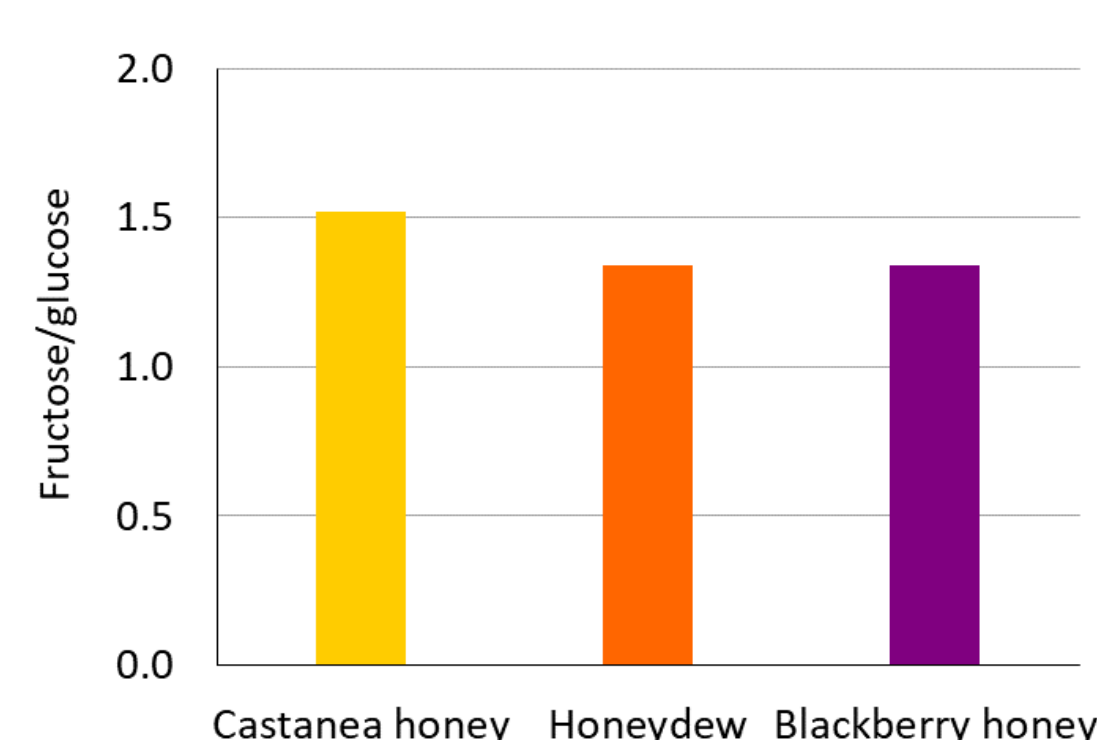
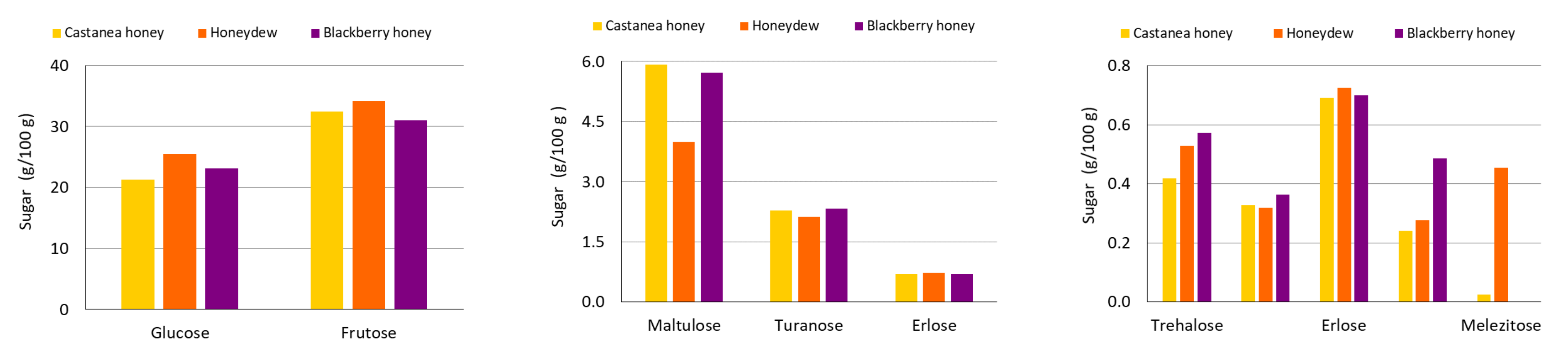
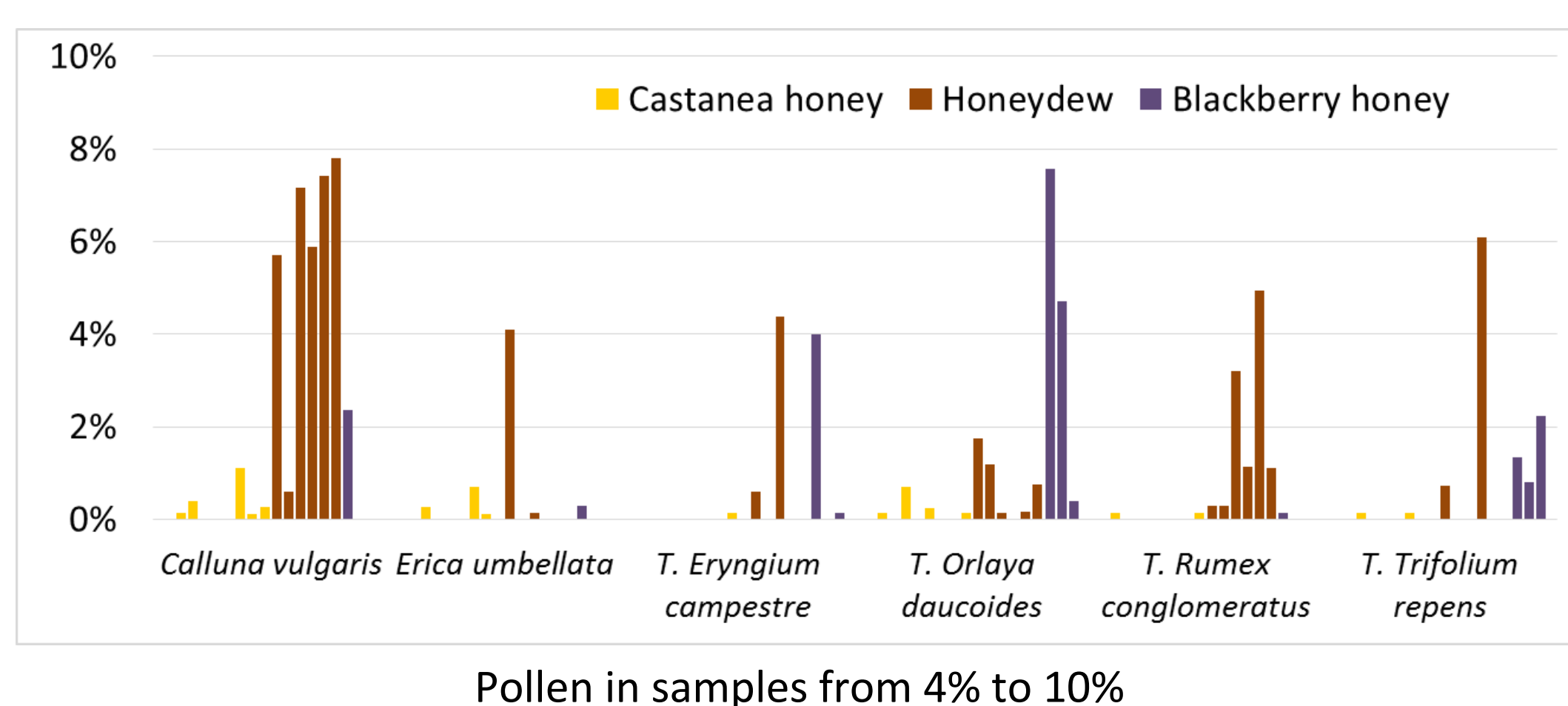
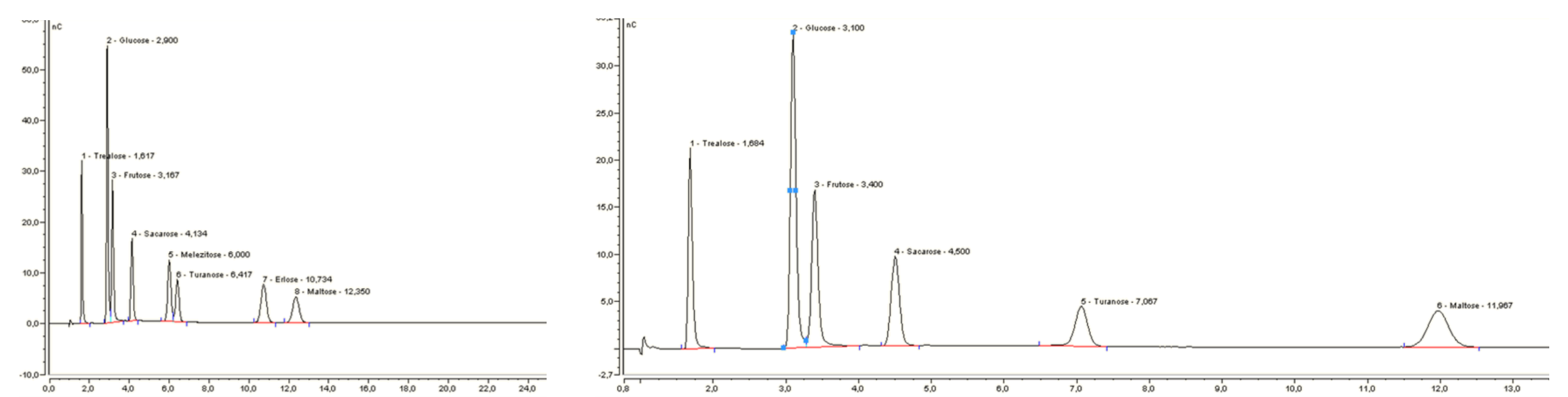
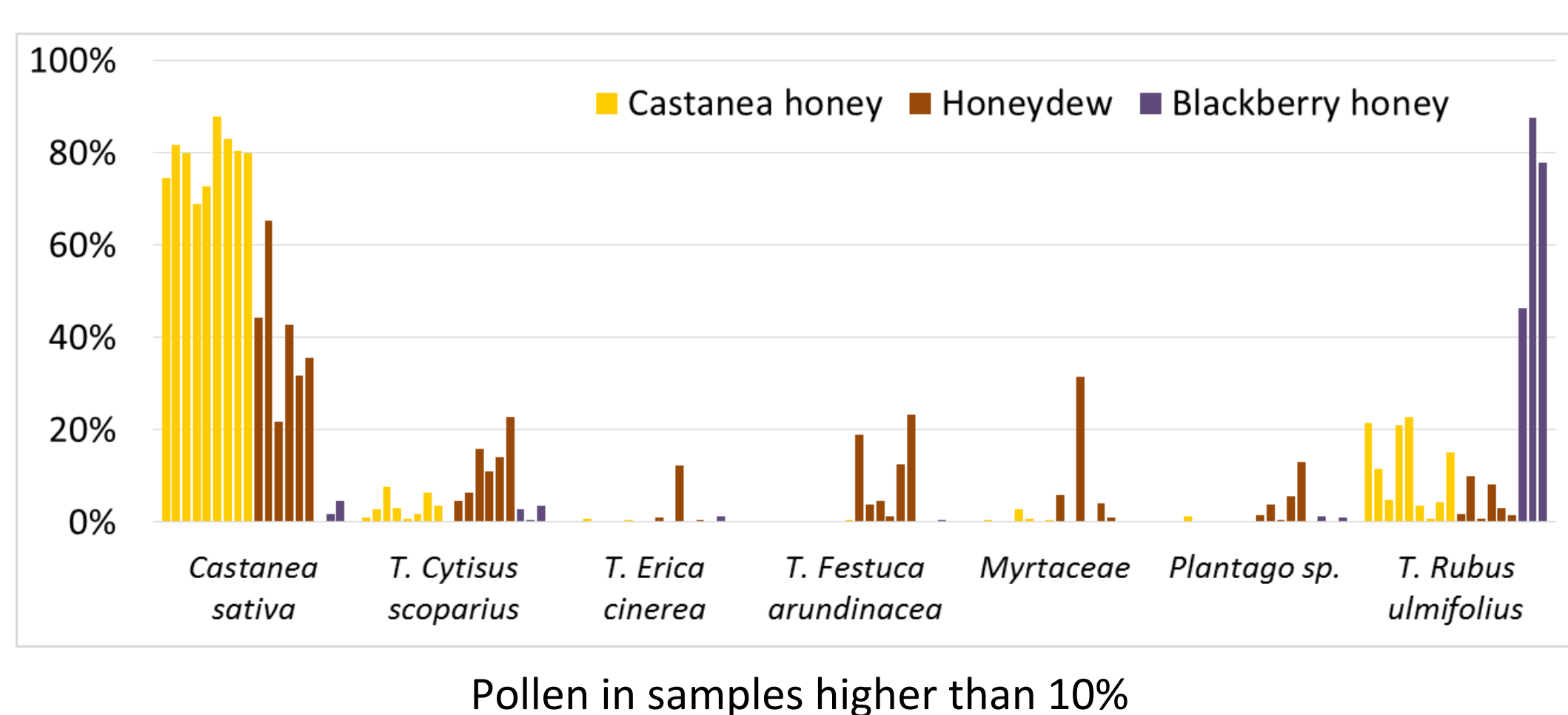
Methods

Pollen analysis was carried out using the method recommended by the International Commission of Bee Botany (ICBB)

The sugar content and profile (trehalose, arabinose, glucose, fructose, sucrose, maltulose, melezitose, maltose, turanose and erlose) were analysed using performance anion-exchange chromatography with pulsed amperometric detection (HPAEC-PAD – ICS3000™ da Dionex®)



Results



Concerning the principal component analysis made with different sugar content and the percentage of the pollen (higher than 10%) the *Rubus* honey samples are very well separated from the other samples and are characterized by higher content in maltose and the absence of melezitose.

Comparing the *Castanea sativa* monofloral honey and honeydew honey, the more relevant differences are observed in the contents of melezitose, maltulose and trehalose. Overall the melezitose is almost null for *Castanea sativa* monofloral honey, whereas for honeydew honey maltulose is 32% lower and trehalose is 21% higher than in the floral honey.