Origin identification of Hungarian chestnut and linden honey using NIR and melissopalynology

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Introduction & Aims

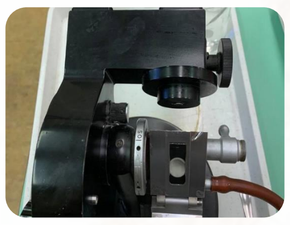
Amount of the compounds in honey depends on the botanical and geographical origin of the honey.
The determination of the origin is very important as it has a high impact not only on the composition, but also on the price of honey.

Therefore, our aim was to identify the botanical and geographical origin of honey samples based on their near infrared and pollen spectra.

Materials and methods

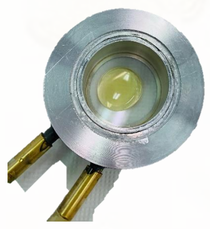
Linden
n= 10

Chestnut
n= 10

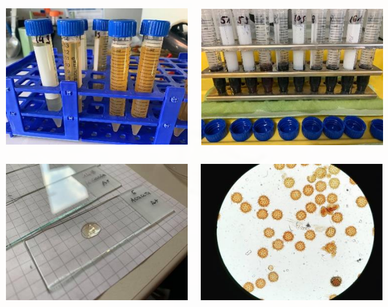


Moisture content

pH, electrical conductivity



- MetriNIR-benchtop
- Transflectance
- 0.5 mm layer thickness
- 740 - 1700 nm
- 3x3 scans / sample

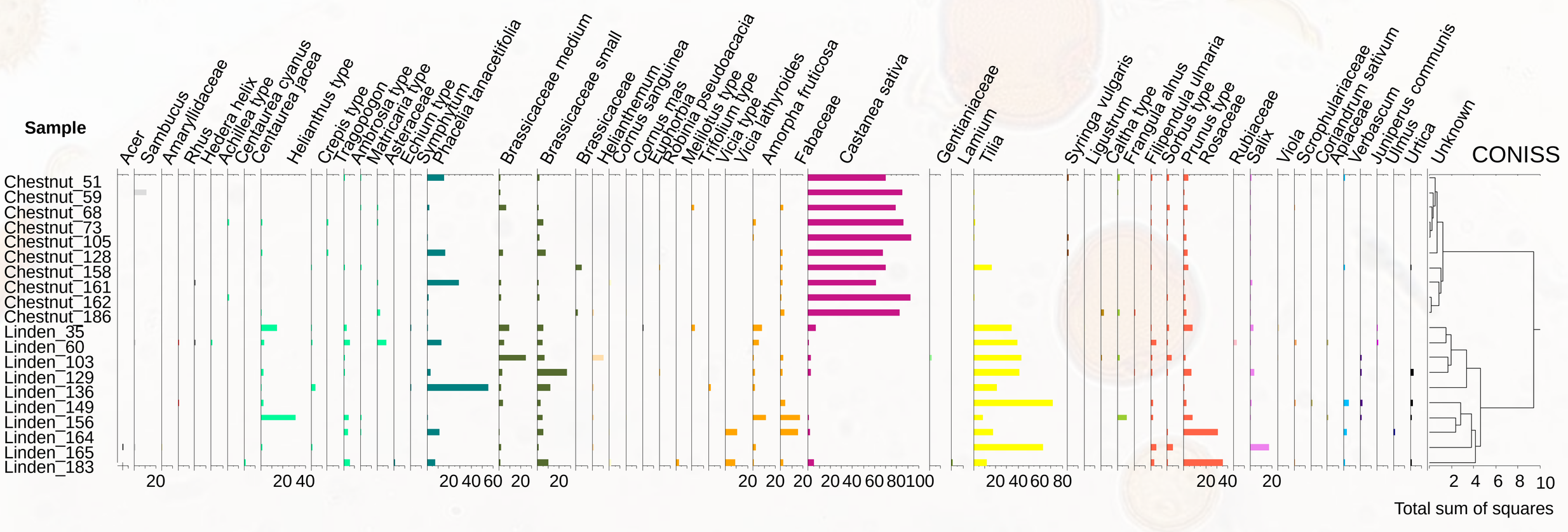


- Pollen analysis
- Acetolysis method
- Fixed slides (glycerin)
- 300 pollen grains

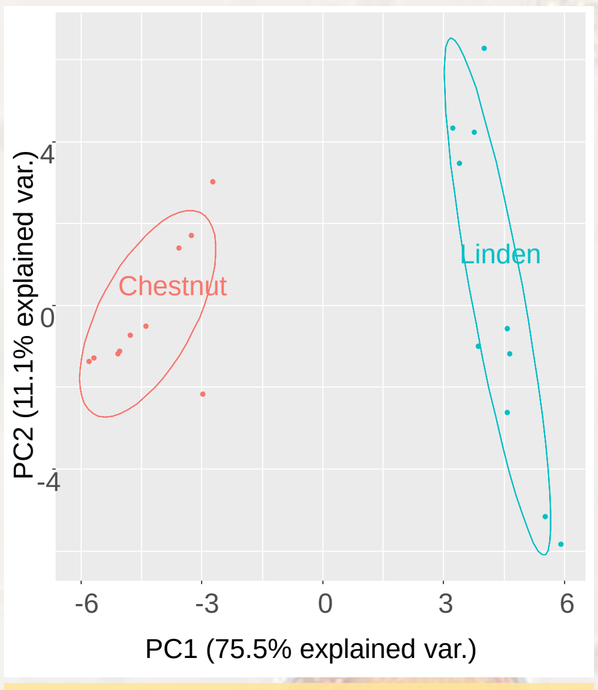
R-project Tilia

- Cluster analysis
- PCA – Principal component analysis
- LDA – linear discriminant analysis

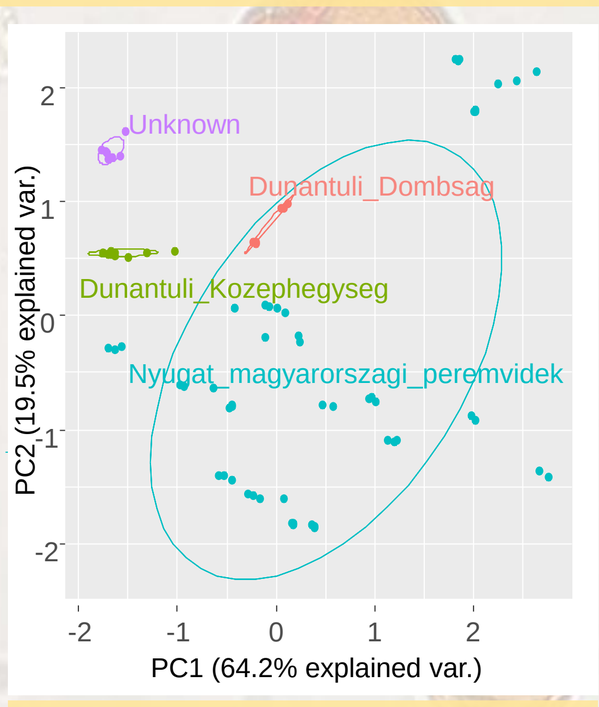
Results And Discussion



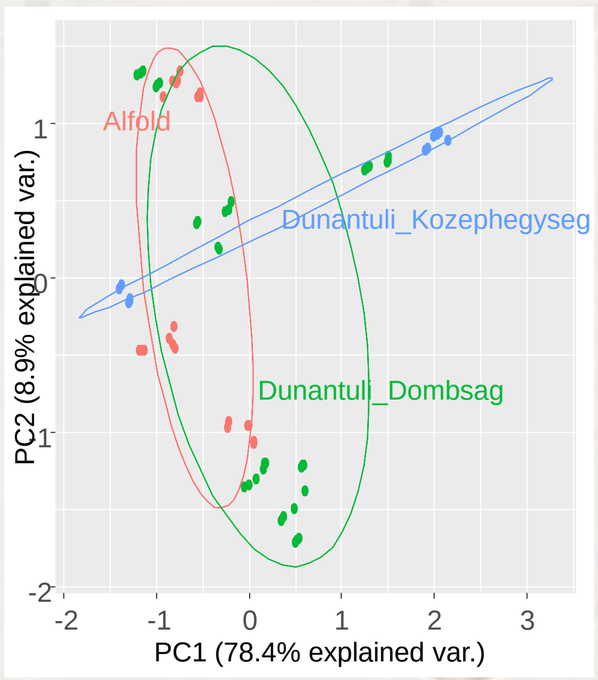
Pollen diagram of the analyzed chestnut and linden honeys colored by family excluding the wind pollinated taxa n=20



PCA results of the pollen data for the linden and chestnut honey according to botanical origin n=20



PCA results of the fusion of pollen and NIR data for chestnut honey according to geographical origin n=73



PCA results of the fusion of pollen and NIR data for linden honey according to geographical origin n=72

- PCA of the mellisopalynology data showed complete separation of the two unifloral honeys, but differentiation regarding the regions was not clear.
- NIR showed high classification accuracy for the separation of regions >90%. Merging the two dataset also provided promising results for geographical classification.

The combination of the two techniques can be useful for the origin identification of honey.

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