

OP-239 [Beekeeping Technology and Quality] Chemical Fingerprinting of Honey - Quality, Origin and Authenticity control

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Background/Purpose

The global honey market is increasingly affected by fraud, with adulteration, dilution, and overheating compromising both consumer trust and the livelihoods of genuine beekeepers. Fraudulent honey is often sold at lower prices, making it difficult for local producers to compete. In recent years, significant advancements have been made in developing techniques and methods to detect adulterated honey, playing a crucial role in cleaning up the market. However, the goal is not only to identify fraud but also to highlight and support those who uphold honesty and integrity in honey production.

Problem Description

To protect authentic honey producers, it is essential to emphasise the superior quality of locally produced honey and showcase its remarkable natural diversity to consumers. Over the years, e-Sense Sweden has developed methodologies to visualise this diversity, highlight unique properties, and optimise honey handling and storage. The development of these analytical tools provides beekeepers with valuable insights, enabling them to assess and communicate the high quality of their honey.

Methodology

We have build a big database of multiple chemical fingerprinting techniques, including HPLC, GC, and FTIR, to build a reference database of honey samples from around the world. This database serves multiple purposes: detecting adulteration, determining geographical origin, and identifying quality deterioration. Furthermore, it provides a scientific basis for demonstrating the natural diversity of locally produced honey and its biological origin.

Results and CONCLUSION: Our results demonstrate that the reference database detects deviations from the typical chemical fingerprint of authentic honey. These deviations may indicate adulteration, improper handling, or mislabelled geographical origin. However, they can also highlight a unique nectar source or an unusual but natural sensory profile.

Practical Implications for Beekeepers

This methodology provides beekeepers with a valuable tool for enhancing honey quality. It can help identify unique batches, optimisation of production processes, and support transparent communication with consumers. By offering scientific validation of honey authenticity and quality, beekeepers can differentiate their products, strengthen market confidence, and sustain fair pricing for genuine, high-quality honey.



Chemical Fingerprinting of Honey

Quality, Origin and Authenticity control

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Me

- M.Sc. Uppsala University, Sweden
- Ph.D. University of Bristol, UK
- 20 years in food and pharma industry
- Founder of e-Sense Sweden AB
- Individual expert in EU Honey Platform

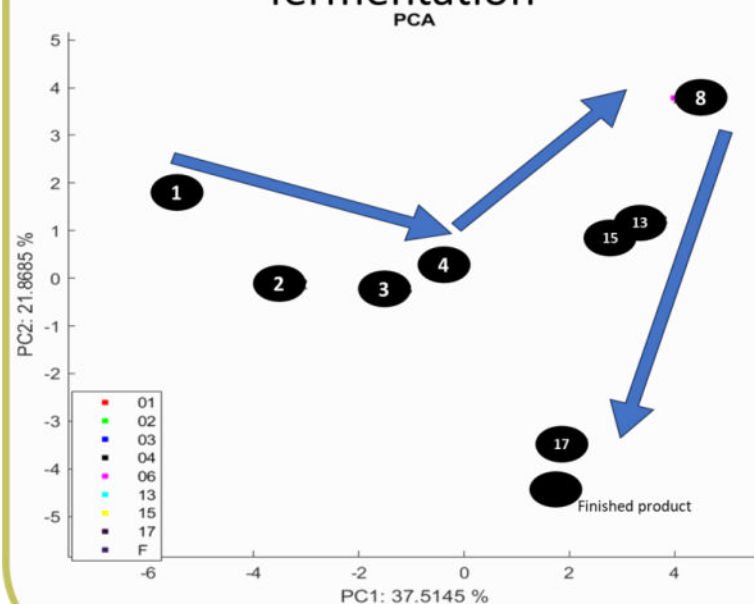


**e-Sense
Sweden AB**

- Chemical fingerprinting of food
- Digital Sensory
- Quality Control
- Product Development

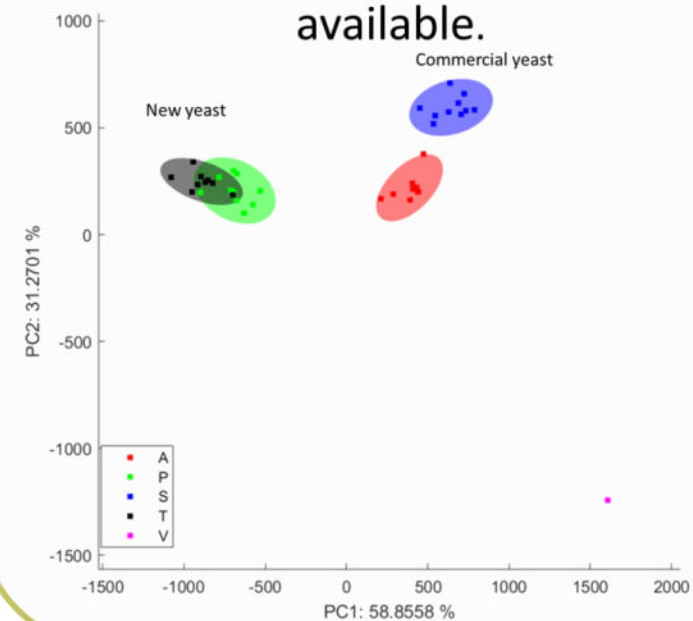


Development of aroma during fermentation

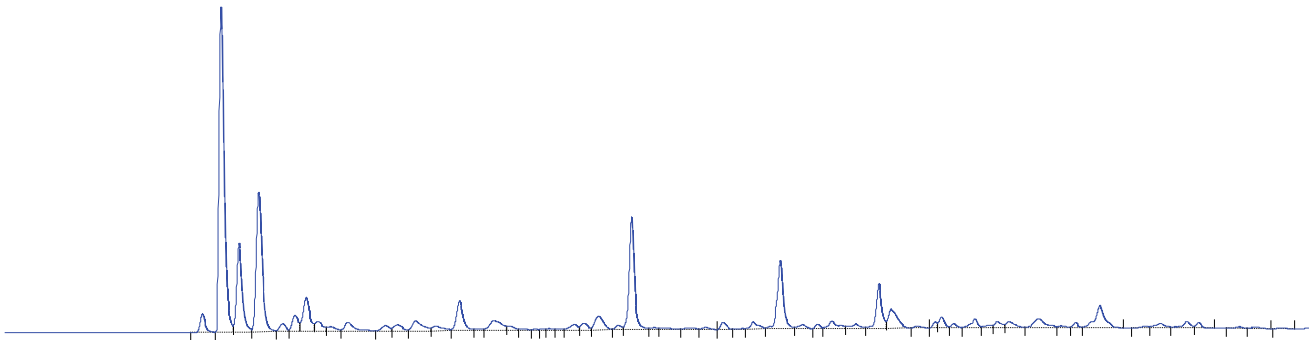


During the fermentation, the aroma profile is constantly developing in different ways.

A clear difference between the new yeasts and the commercial available.



Chemical fingerprinting



Aromaprofiles

Sugarprofiles

Acid profiles

Honey directive

Fingerprint of unknowns

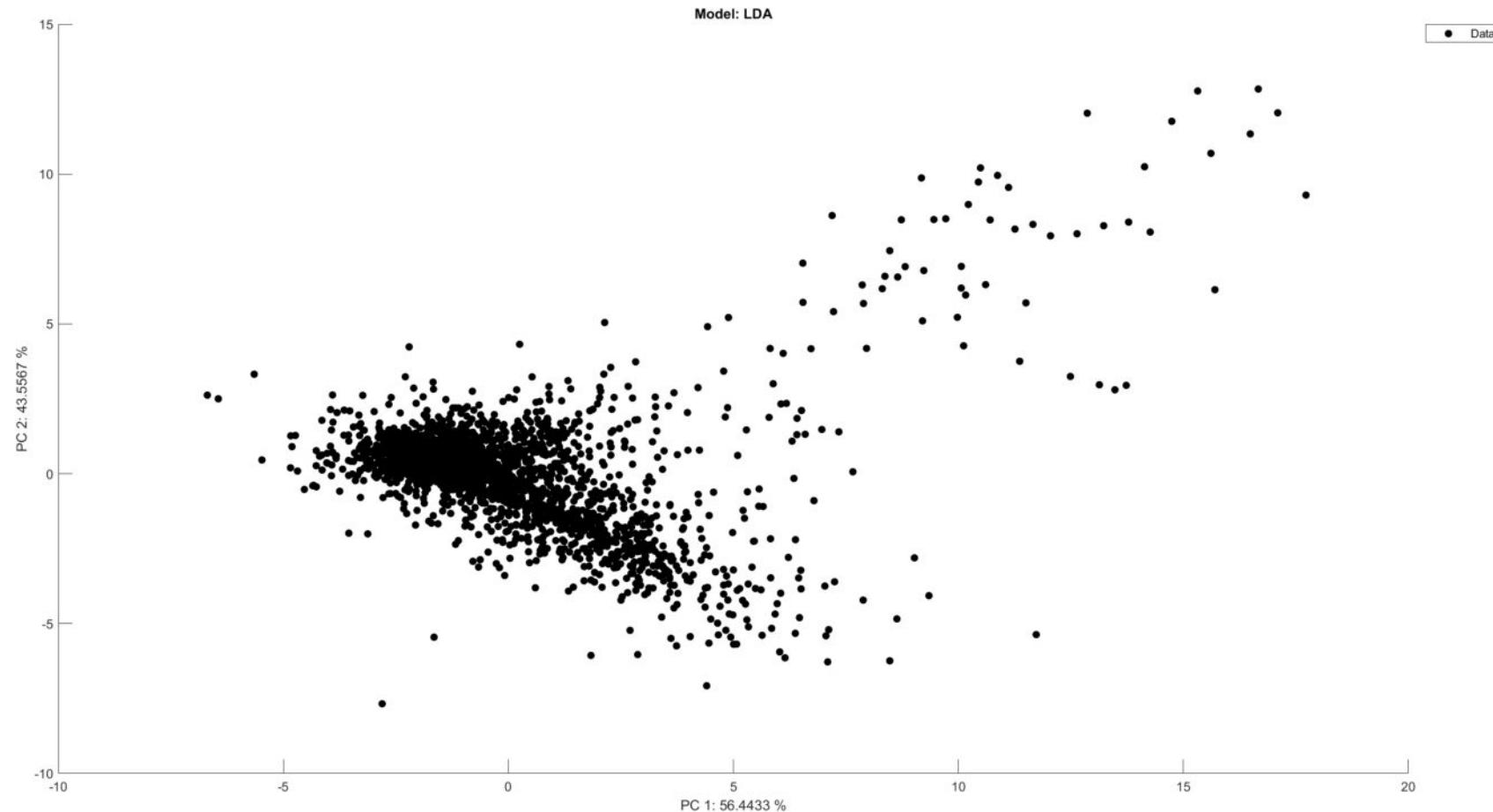
Pollen

Sensory data

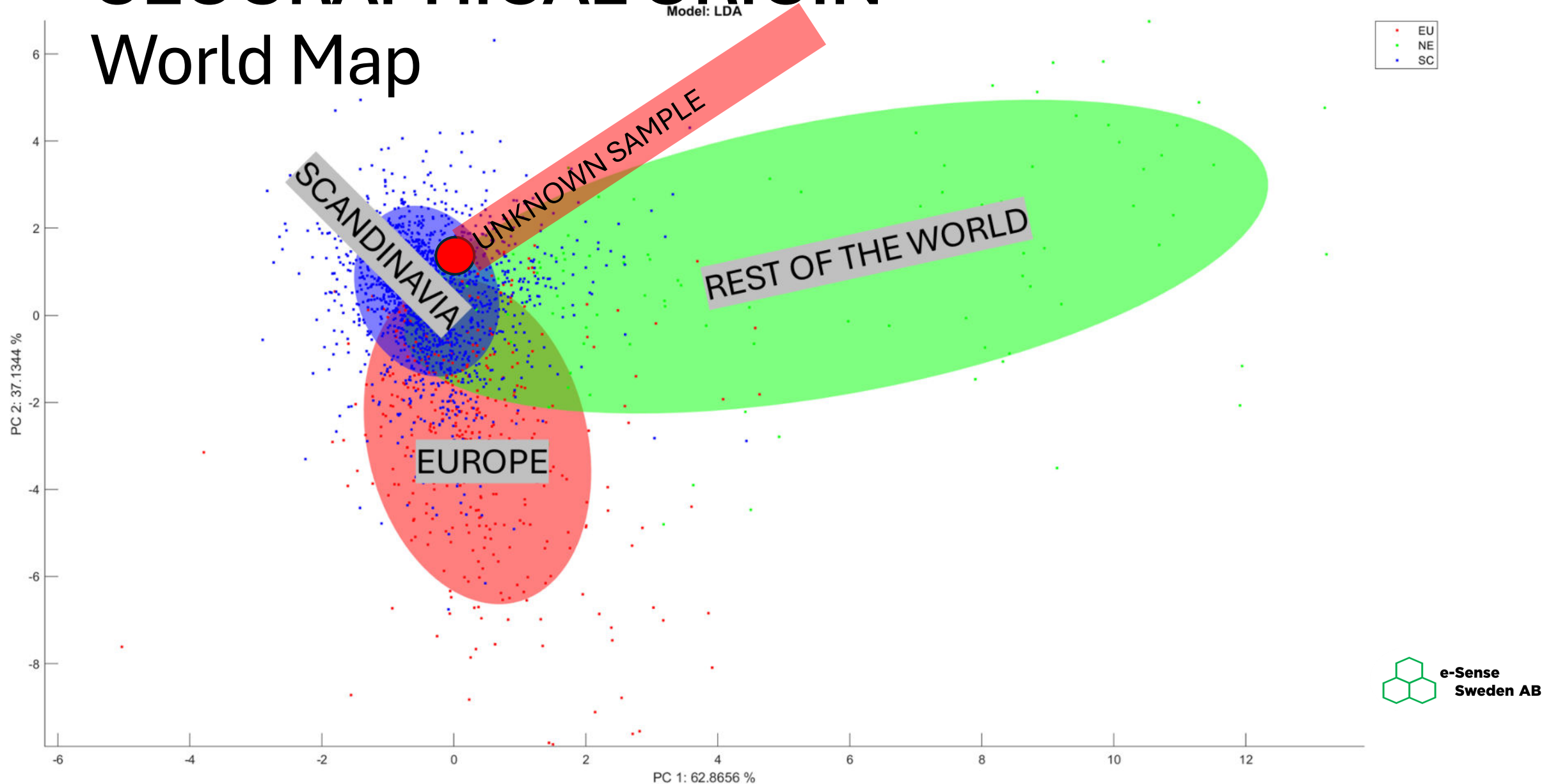
Metadata

e-Sense Honey Database

- 2500 honey samples
- 28 countries

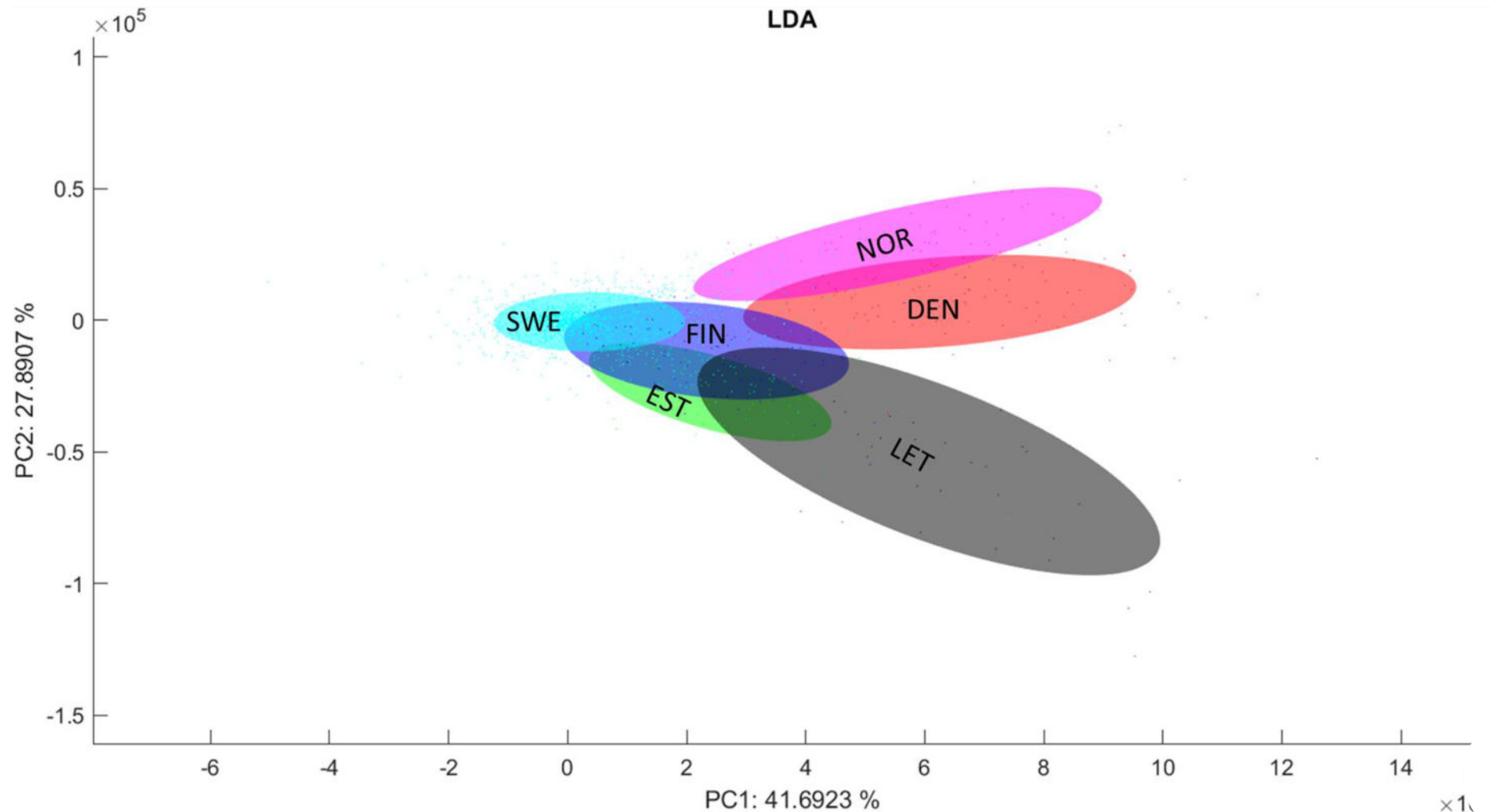


GEOGRAPHICAL ORIGIN World Map



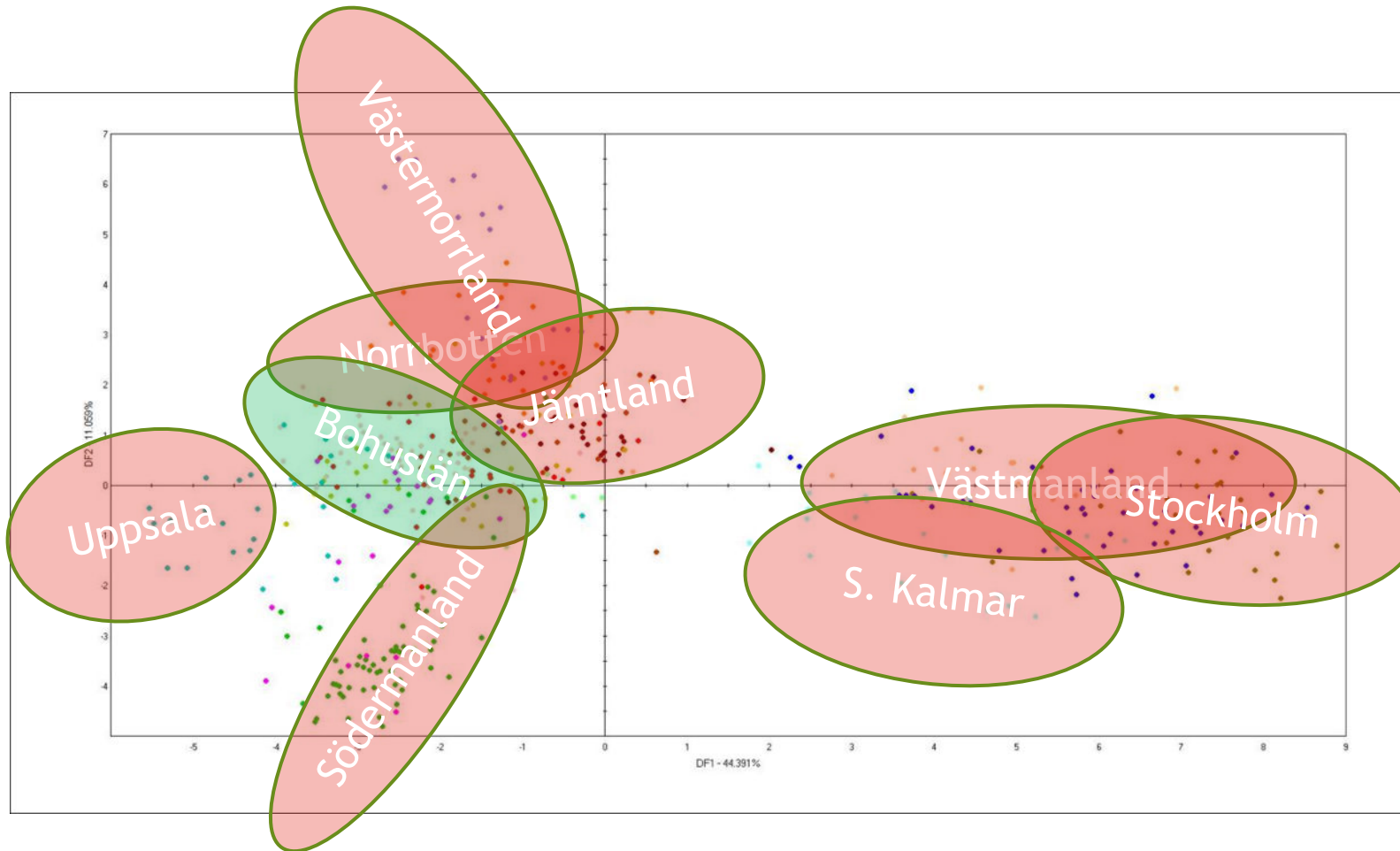
GEOGRAPHICAL ORIGIN

Northern Europe

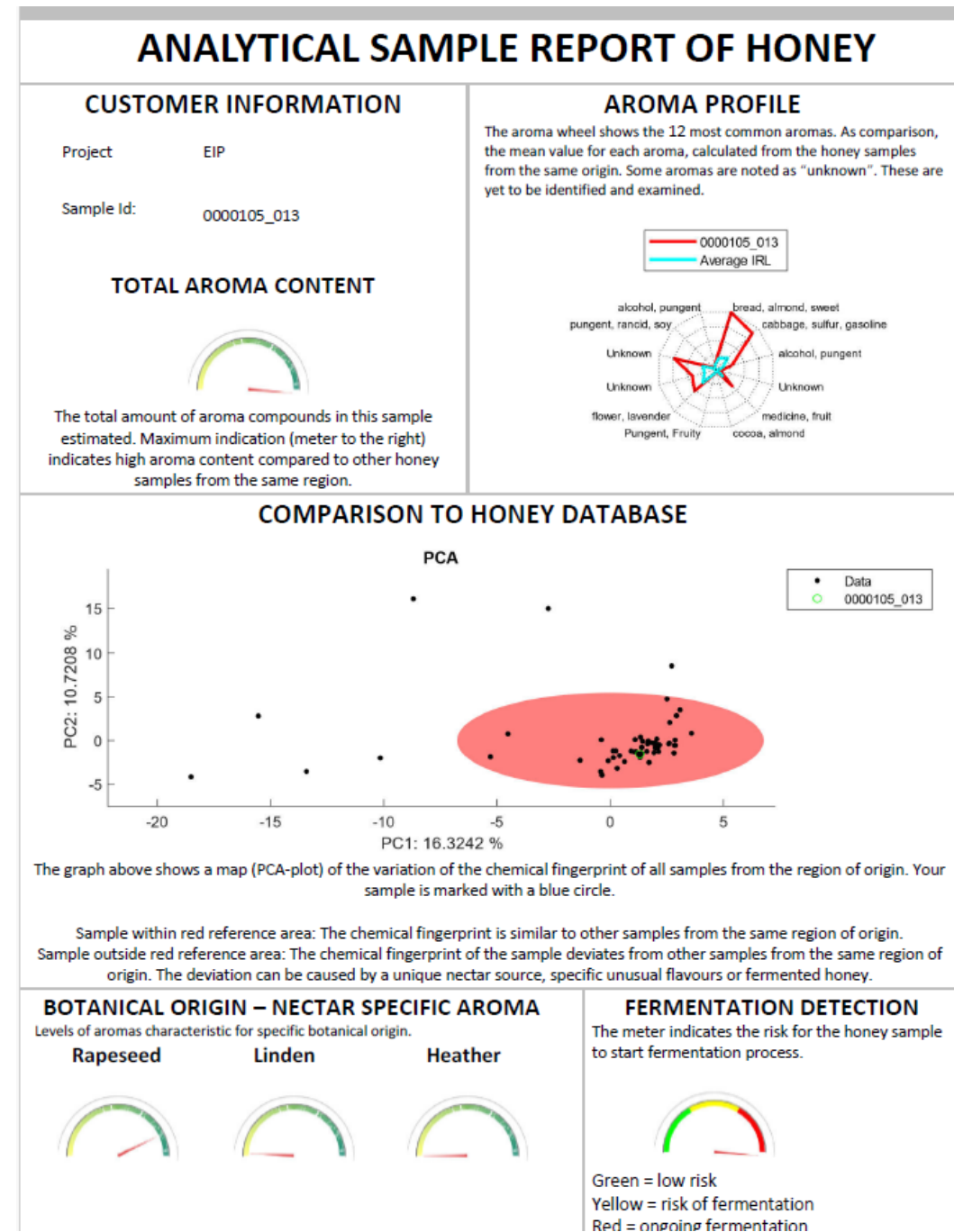


e-Sense
Sweden AB

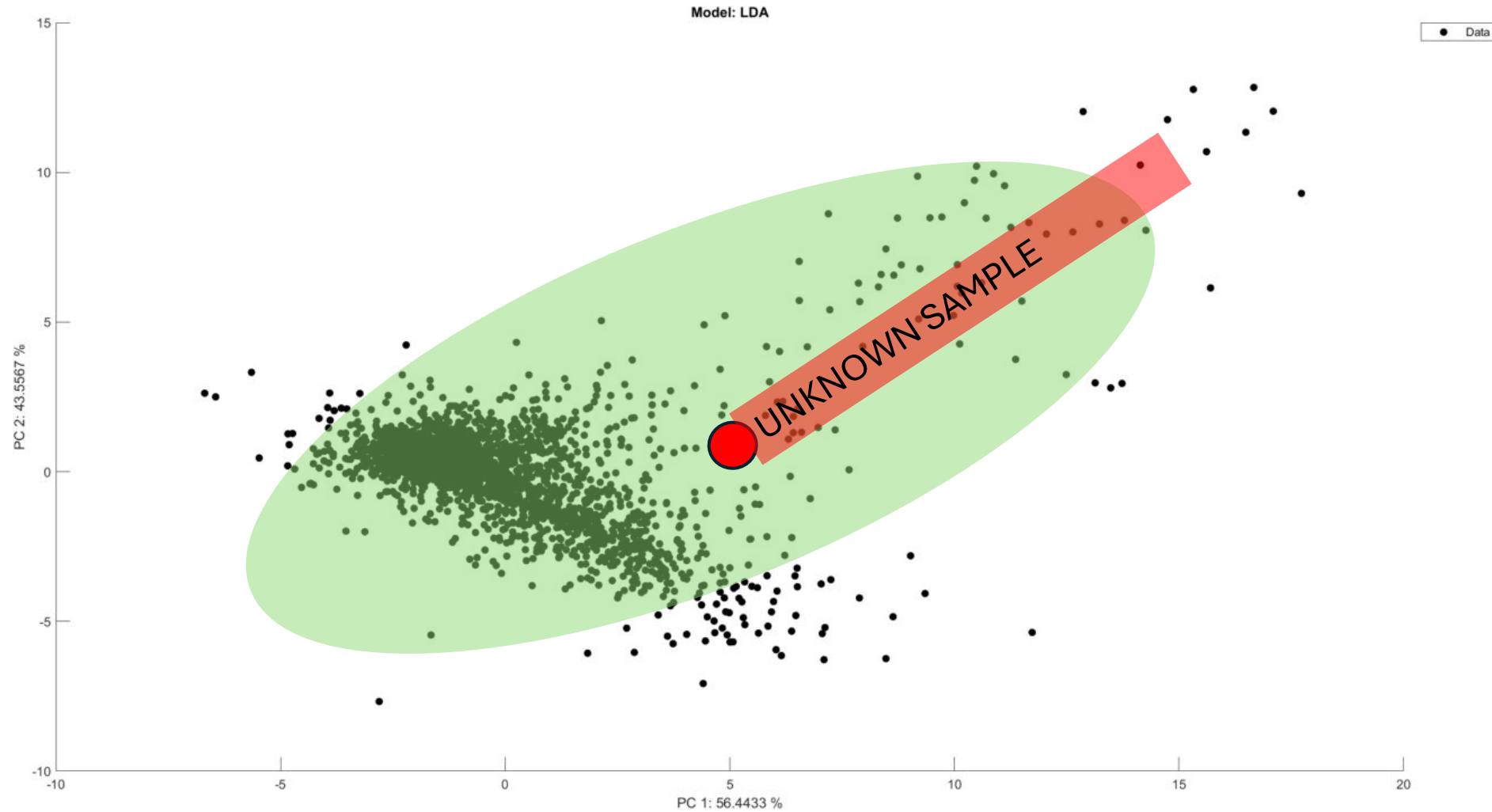
GEOGRAPHICAL ORIGIN Sweden



Individual Reports



AUTHENTISITY CONTROL



SUMMARY AND FUTURE DEVELOPMENT

- Chemical Fingerprinting – fast and cheap
- Available in the market
- DNA-profiles to improve accuracy

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