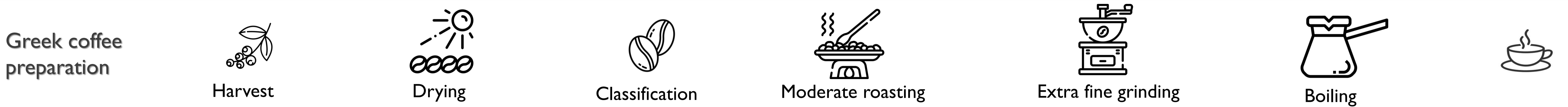# Applying Polarized Projective Mapping (PPM) combined with Ultra Flash Profiling (UFP) for the sensory characterization of a large set of Greek Coffees. Correlation with production parameters and chemical properties.

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Greek coffee preparation — Harvest — Drying — Classification — Moderate roasting — Extra fine grinding — Boiling
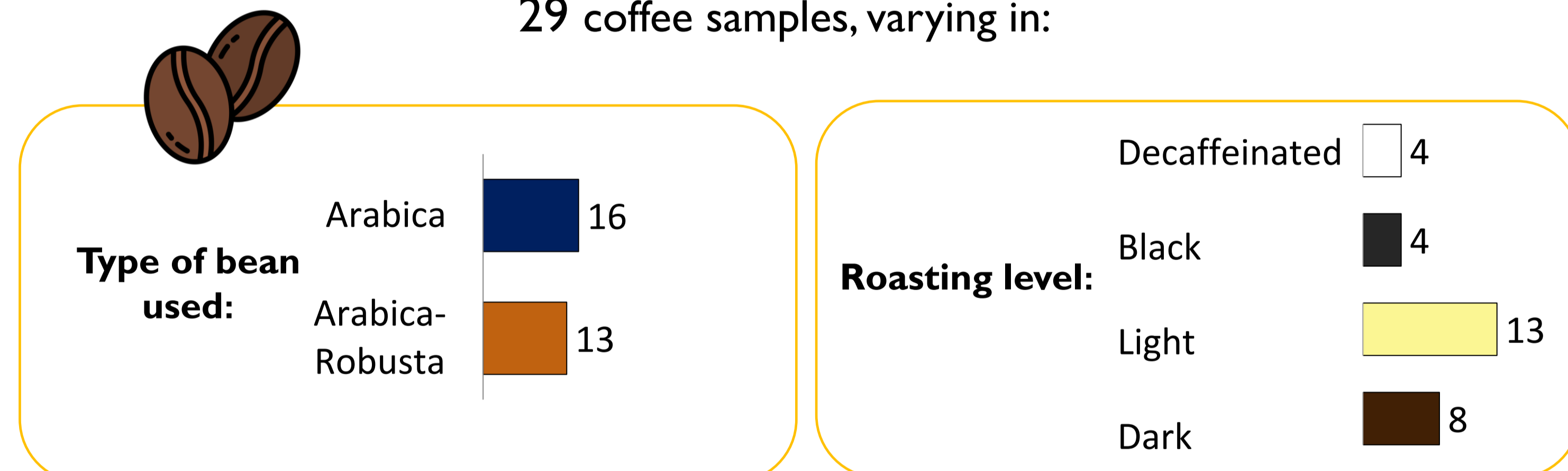
Introduction

Greek or Turkish coffee is currently the most popular type of coffee consumed in Greece, traditionally served in a small cup. It is a "boiled" type of coffee, forming a foamy top and a grainy sediment at the cup bottom, when boiled, thus providing a different sensory experience to consumers. Despite extended research on the sensory properties of coffee in general, knowledge on the sensory properties of Greek -Turkish coffee is to day, limited.

Aims

- Profile a large set of Greek coffee samples (29)
- Apply Polarized Projective Mapping (PPM) to the sample set
- Correlate sensory to instrumental analysis data

Materials and methods

29 coffee samples, varying in:

Type of bean used:
- Arabica — 16
- Arabica-Robusta — 13

Roasting level:
- Decaffeinated — 4
- Black — 4
- Light — 13
- Dark — 8

Twelve (12) assessors trained on wine but not on coffee tasting

1st session: Familiarization to the product category and use of CATA questionnaire for description of a small representative product selection (5 coffees, representing all beans & roasting levels used)

2nd session: Definition of the poles

Poles:
- **A:** Light, Arabica
- **B:** Dark, Arabica/Robusta
- **C:** Light, Arabica/Robusta
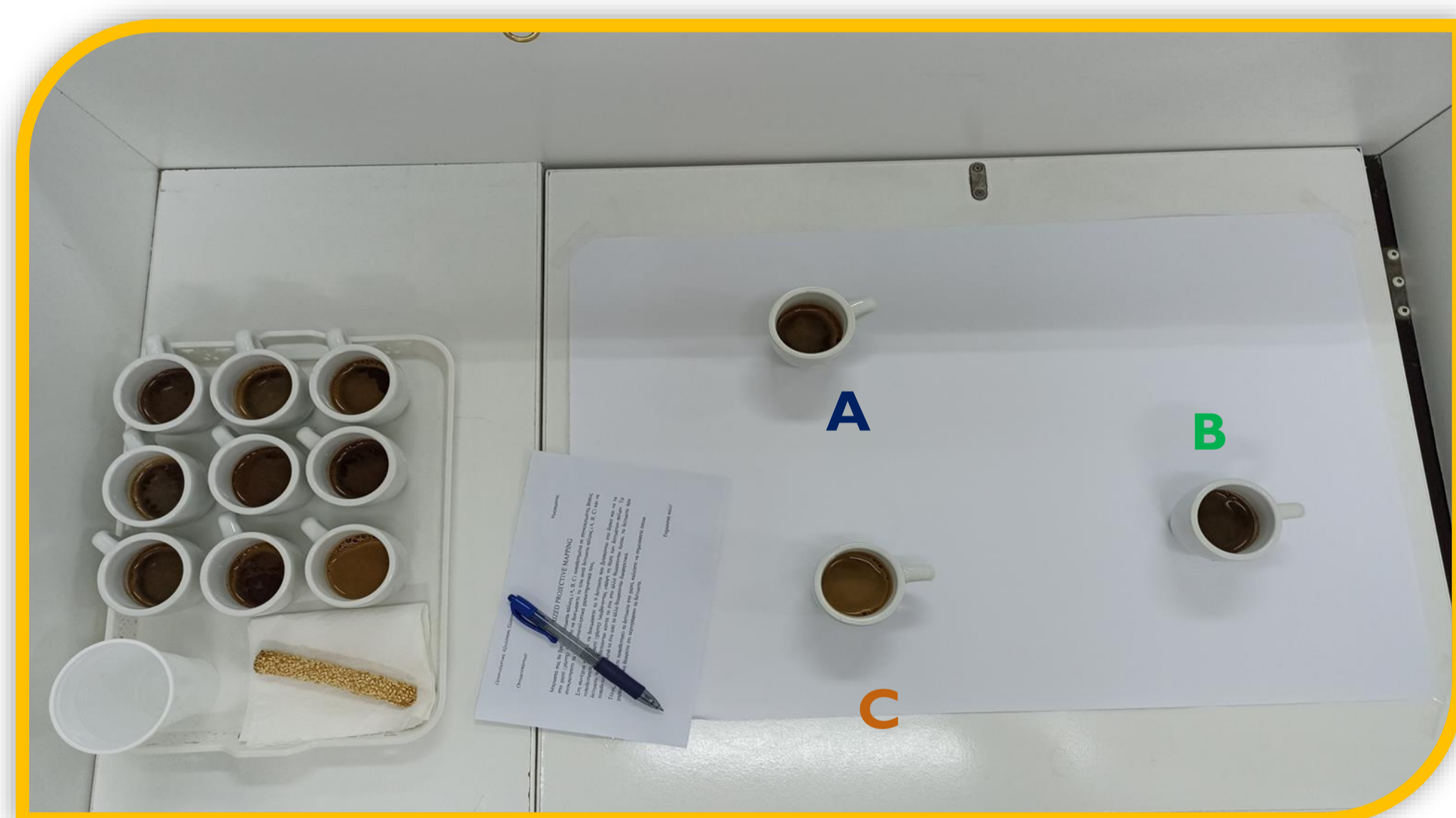
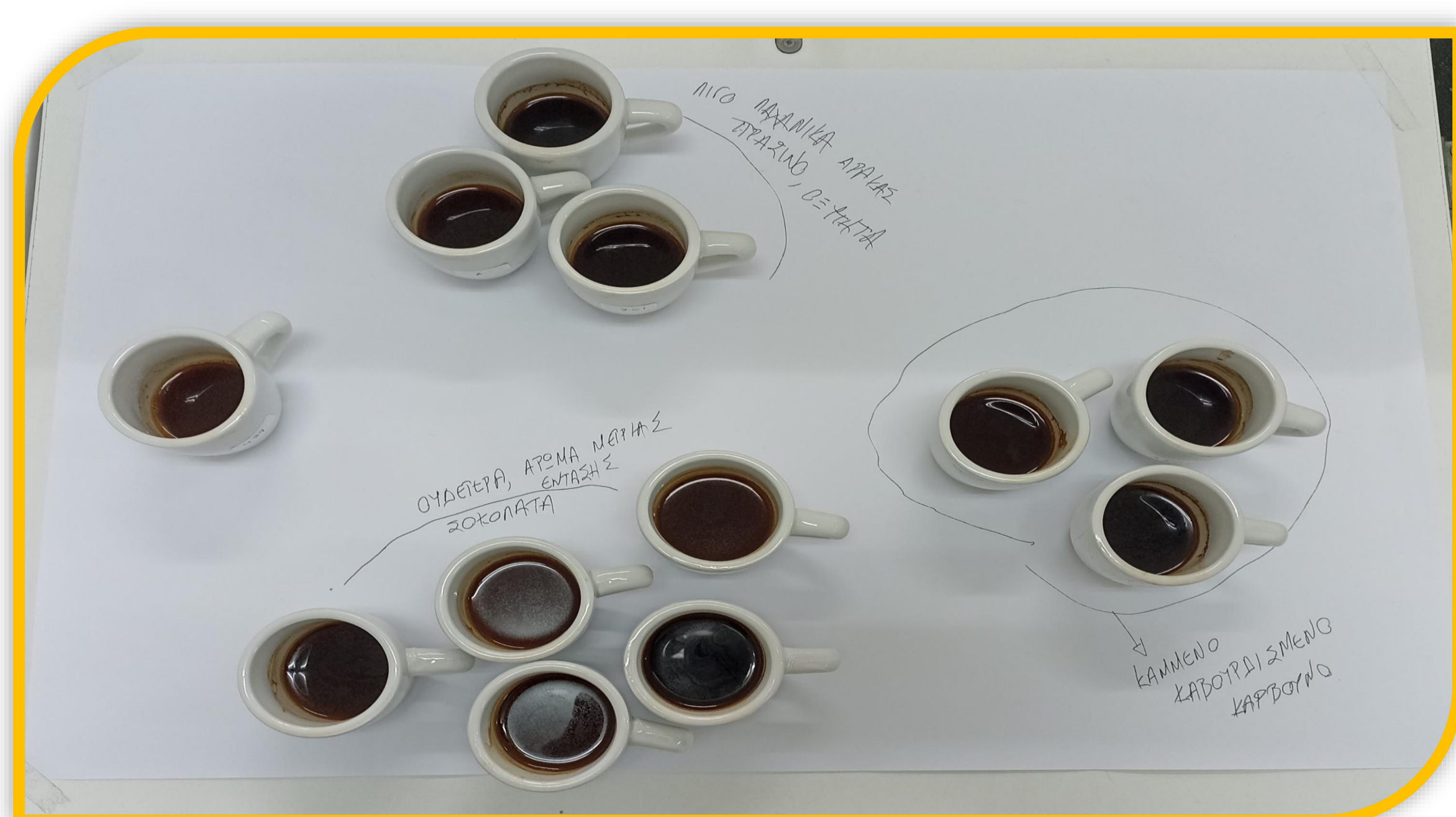**Projection of the poles**

3rd, 4th, 5th Sessions: Main sensory methodologies

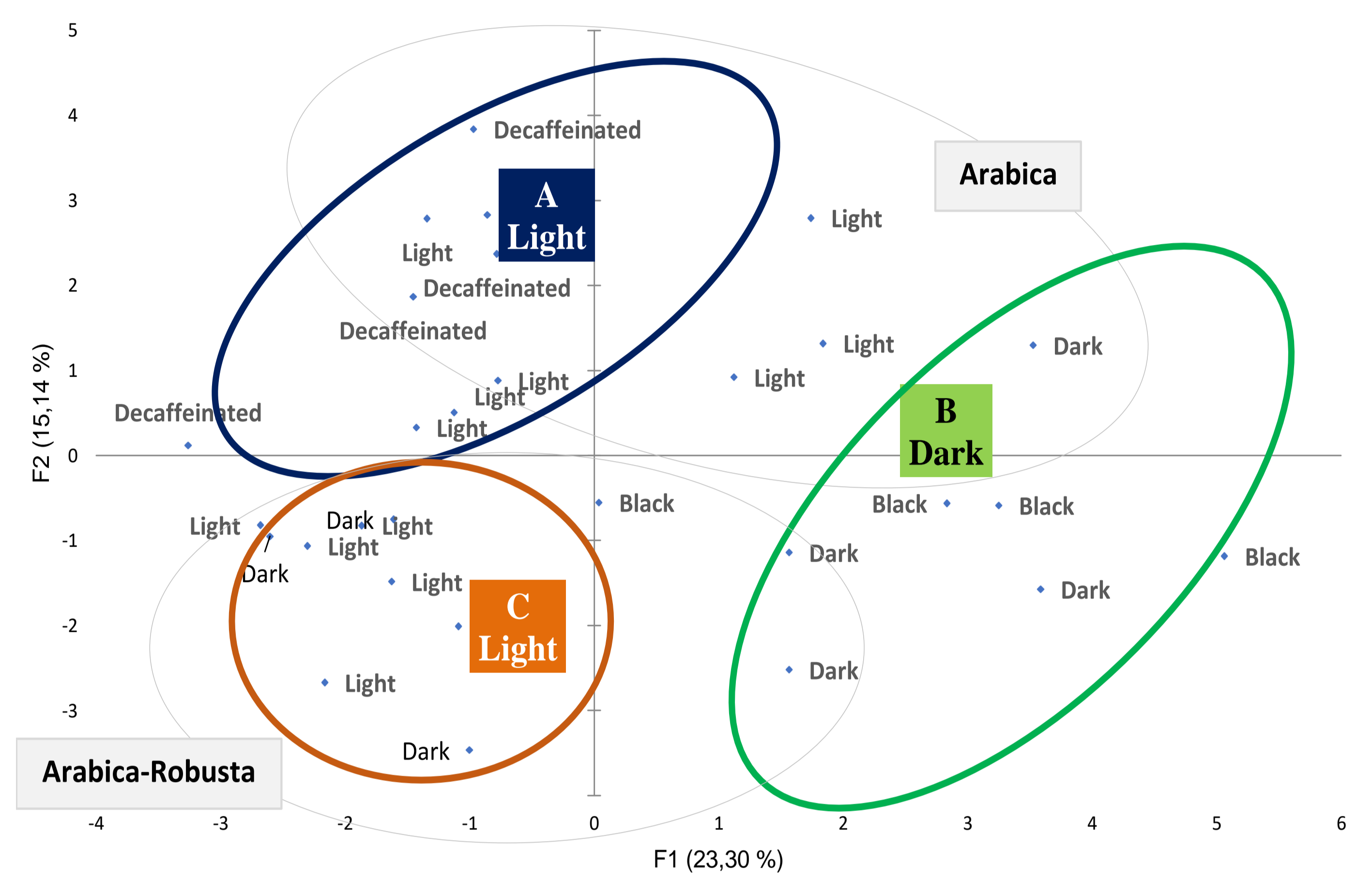Polarized Projective Mapping (PPM) combined to Ultra Flash Profiling (UFP). Twelve (12) samples evaluated per session (9 samples + 3 poles)

**Polarized Projective Mapping & Ultra Flash Profiling product space for 12 Greek coffee samples**

Results

Multiple Factor Analysis (MFA), on Polarized Projective Mapping data

- MFA gave clear clustering of the samples around the poles used
- Correlation between sensory poles and roasting level- light, dark, black- of the coffees
- Correlation between sensory groups around the poles and coffee beans used

Hierarchical Cluster Analysis dendrogram from Ultra Flash Profiling data.
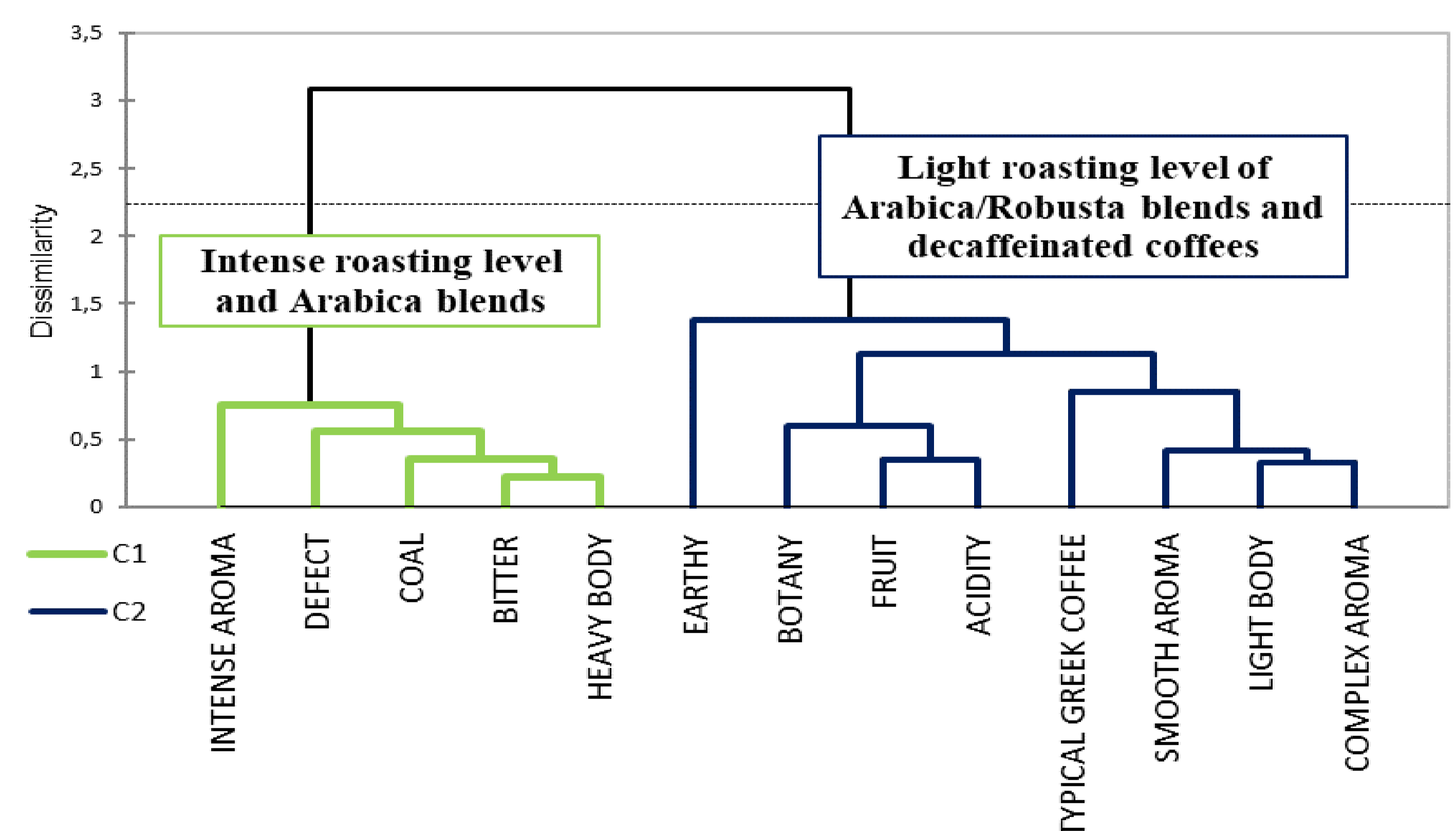
- Botany-Fruit-Acidity ⟶ Decaffeinated, and Arabica Light Roasted
- Defect-Bitter Coal-Intense Aroma-Heavy Body ⟶ Heavy Roasted, Arabica-Arabica/Robusta
- Typical-Smooth Aroma-Complex Aroma-Earthy ⟶ Light Roasted, Arabica/Robusta

Conclusions

Application of PPM and UFP to the Greek coffee category, revealed:

- ✓ Clear separation and grouping of the coffees around the poles
- ✓ Combination of those methods worked well for a complex product category, large number of products and assessors with limited experience on the category
- ✓ Good correlation between sensory information, roasting level, and type of the coffee beans, used
- ✓ Good correlation between sensory information and colour instrumental measurements

References

- Ares, G., de Saldamando, L.,Vidal, L., Antúnez, L., Giménez, A., & Varela, P. (2013). Polarized projective mapping: Comparison with polarized sensory positioning approaches. *Food Quality and Preference*, 28(2), 510-518.
- Interface icons used were from www.flaticon.com

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