



NOVELBALTIC

Market driven authentic non-timber forest products from the Baltic Sea region



EUROPEAN
REGIONAL
DEVELOPMENT
FUND

NovelBaltic



HOW TO PROVE QUALITY OR AUTHENTICITY OF A PLANT-BASED PRODUCT?

What is wanted from the product?
Is the quality determined by the color, scent,
aroma or healthiness?

Show specialness by determining

- Species-specific compounds by LC or MS:
 - e.g. anthocyanins in bilberries^{NB}
 - e.g. benzoic acid and resveratrol in lingonberries
 - e.g. lipids in chaga^{NB}

Measure aroma, scent or color by

- Taste sensor analysis by electronic tongue or human senses
- Flavor and fragrance analysis
- Color value and intensity
- Chlorophyll content by LC

Show healthiness by measuring

- Total polyphenol content by Folin-Ciocalteu's assay^{NB}
- Antioxidant capacity by DPPH, ABTS, ORAC or CUPRAC assay^{NB}
- Total anthocyanin content by UV-Vis or LC^{NB}
- Vitamins by LC

Is authenticity of the product
important? Do you need to show
proof of the species?

Prove authenticity by DNA based methods

- dPCR analysis^{NB}
- Bar-HRM analysis^{NB}

Chemical-based methods

- Chemical composition:
 - e.g. anthocyanin profile by LC^{NB}
- Principal component analysis (PCA)^{NB}
- Isotope analysis by MS^{NB}

How about showing proof of the origin?

Methods to prove origin are being developed. Depending on the species and product, some methods are already available.^{NB}



GUIDE TO SELECT ANALYSES FOR PLANT-BASED PRODUCTS

Quality verification

Quality verification

DNA-based authenticity

Chemical-based authenticity

Analyses

Antimicrobial properties
Antioxidant capacity
Total polyphenol content
Total anthocyanin content

Vitamins
Anthocyanins
Species-specific compounds
Lipids

ddPCR analysis
Bar-HRM analysis

Isotope analysis
(coupled with principal component analysis)
Anthocyanin profile

Equipment

- Agar well diffusion
- UV-Vis spectrophotometer
- Near-infrared spectrometer

- Liquid chromatography
- Gas chromatography

- ddPCR instrument
- qPCR instrument

- Isotope-ratio mass spectrometer
- Liquid chromatography

Pros

- Provides information about microbiological properties or total contents
- Easy and fast

- Provides information about individual compounds
- Accurate results

- Provides information about berry species used as ingredients

- Provides information about berry species

Cons

- Directional results
- Susceptible to interferences

- Requires knowledge of the compounds found in the species

- Good quality DNA is required

- Available only for few species





THANK YOU!



UiT The Arctic University of Norway



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