

Topic/Title (Norwegian)

Utvikling av LC-MS/MS metode for bestemmelse av matrine og oksymatrine i lakris og honning

Topic/Title (English)

Development of an LC-MS/MS method for the determination of matrine and oxymatrine in licorice and honey.

Picture



Summary (Describe the topic/thesis, type of thesis work: field work, laboratory work, literature study)

Matrine and oxymatrine are quinolizidine alkaloids typically found in various plants in the Fabaceae family, including the genus *Sophora flavescens*. Extracts of these plants have traditionally been used in Chinese medicine due to various pharmacological activities, including anti-inflammatory, anti-viral, and antidiabetic effects. Despite their potential benefits, matrine and oxymatrine can also be toxic and have been found to induce e.g., liver damage.

At present, matrine and oxymatrine are classified as biological pesticides in the EU (from 2021) and are potential contaminants in products based on licorice roots. As pesticides, oxymatrine and matrine act as insecticides. These insecticides are especially efficient against termites but have also shown toxic effects on e.g., mosquito larvae and pupae (for treatment of mosquito breeding sites). In the EU, the use of these pesticides is considered a concern for human health due to limited data on potential genotoxic effects. Hence, the use of these compounds as pesticides is not approved in the EU. As a contaminant, oxymatrine, and matrine can be found in licorice products due to the co-harvesting of *Sophora* roots growing near the licorice roots.

Due to the potential health risks of oxymatrine and matrine, the monitoring of these compounds is desired by the Norwegian Food Authority. The development of an LC-MS/MS method for the determination of these compounds in licorice and honey is needed and could be a project for 30 credits Master's degree.



Project structure:

A literature study focusing on e.g., the compounds, their use, and their properties for the evaluation of potential sample preparation procedures and relevant analytical tools.

Optimization of LC and MS parameters including analytical columns, flow rates, mobile phases, pH, ion transitions, collision energies, etc.) using a triple quadrupole MS.

Validation of the method according to current regulations and standards within the field.

Subject area (keywords)

Matrine, oxymatrine, alkaloids, method development, LC-MS analysis, validation

Language thesis (Norwegian and/or English)

Norwegian or English

Bachelor or Master thesis

Master thesis

Credits

30

Project period

2024

Project/company

NIBIO

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