

Project: Diagnostic tools for *Brettanomyces* detection

Candidates	:	
Duration	:	16 weeks – one semester
Report	:	xx.yy.zzzz, 11.59pm
Advisor	:	Benoit Bach
Co- Advisors	:	Jean-Manuel Segura, Fiorella Lucarini
Abbreviation	:	
Key Words	:	Winemaking ; <i>Brettanomyces bruxellensis</i> ; contaminations ; HACCP

1. Description

Brettanomyces bruxellensis is a dreaded yeast in oenology due to its organoleptic impact and ubiquitous presence at all stages of winemaking. It produces aromatic compounds that impart unpleasant flavors to the wine. Naturally present in vineyards, it is difficult to eradicate once established in cellars, with some strains having developed resistance to sulfites and the ability to form biofilms. This interdisciplinary project will aim to improve microbiological risk management through a strategy of monitoring critical points using chemical and biological analyses followed by interventions. This approach must take into account the specificities of Swiss winemaking cellars, particularly regarding the costs involved.

2. Objectives

1. The team should perform a literature review on the topic of:
 - a. *Brettanomyces bruxellensis* and their contaminations in wineries.
 - b. Analytical tests and methods for the detection and monitoring of *Brettanomyces bruxellensis* contaminations.
 - c. Chemical and biological means to prevent and control contaminations by *Brettanomyces bruxellensis*.
 - d. Current protocols and measures used to prevent and control contaminations by *Brettanomyces bruxellensis*.
2. Based on the currently available reagents, tests and methods, the team should develop an interdisciplinary HACCP plan (Hazard Analysis Critical Control Points) including the planned interventions, suitable for Swiss winemaking cellars and enabling the prevention and control contaminations by *Brettanomyces bruxellensis*. The selection of the reagents, tests and methods should be performed based on a panel of objective criteria to be defined.
3. The team should identify the research needs to develop and implement the envisaged HACCP plan and propose a budget and a timeline for a project aiming to develop, implement and validate the HACCP plan.
4. The team should identify the current technical and scientific bottlenecks limiting the efficiency of the envisaged HACCP plan using existing reagents, tests and methods and define which features novel reagents, tests or methods should exhibit to enable the development of more efficient HACCP plans. The team should make preliminary proposals about innovative reagents, tests and methods that would exhibit the desired features.

3. Remarks

Templates for the report and additional information can be found on the MLS pages on Cyberlearn.

On the due date of the report, the following documents have to be provided by the candidates:

- Report in electronic form (Word and PDF) to the advisor and co-advisors
- The report can be written in English, French or German and should be limited to 20 pages in length (excluding appendices).

A defense and an individual interview with the advisor and co-advisors are part of the evaluation.

Plagiarism in any form is not accepted. Any case of plagiarism or professional misconduct will be prosecuted following the rules of the HES-SO.

19.06.2024, Changins

Benoit Bach
Advisor

Dr. Urban Frey
Head of Master HES-SO MLS

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