Non-Saccharomyces yeastnitrogen consumption and metabolite production during wine fermentation

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▶ **To cite this version:**

Pauline Seguinot, V Englezos, G Bergler, P Brial, Anne Ortiz-Julien, et al.. Non-Saccharomyces yeastnitrogen consumption and metabolite production during wine fermentation. OENO 2019 11thSymposium of Oenology, Jun 2019, Bordeaux, France. hal-02966818

HAL Id: hal-02966818
https://hal.inrae.fr/hal-02966818

Submitted on 14 Oct 2020

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Non-*Saccharomyces* yeast nitrogen consumption and metabolite production during wine fermentation

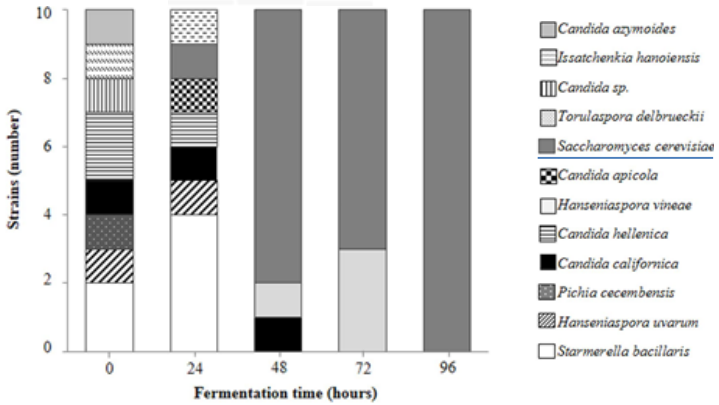
P. Seguinot, *V. Englezos, G. Bergler, P. Brial, A. Ortiz-Julien, M. Brulfert, C. Camarasa, A. Bloem*

OENO 2019 _ 11th Symposium of Oenology
25th-28th June 2019, Bordeaux, France

Context: toward the diversification of enological yeasts

- Wide diversity of yeast species at the beginning of the fermentation

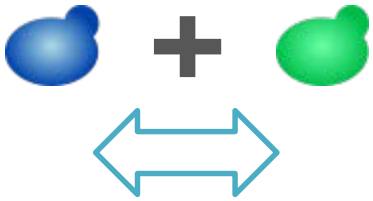
→ But domination of *S. cerevisiae* at the end of FA



- Use of active dry yeasts to control the process
- Some of the non-*Saccharomyces* yeasts have interesting properties

- Association of a non-*Saccharomyces* strain with *S. cerevisiae*:

Non-*Saccharomyces*
Aroma production
Do not complete the fermentation



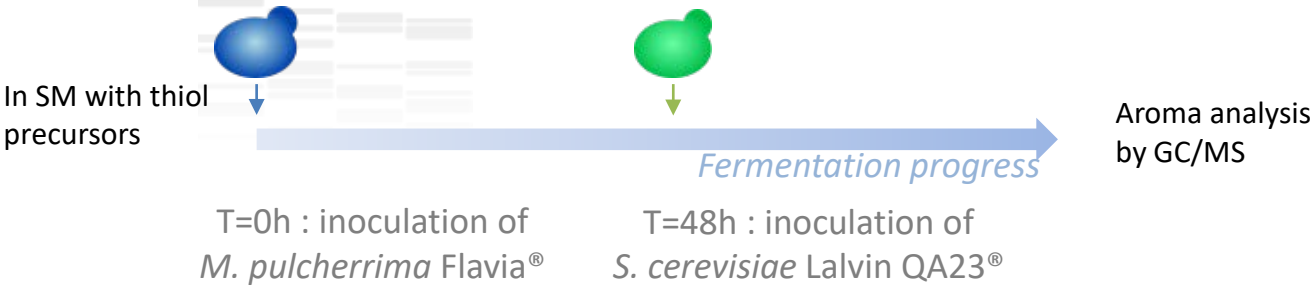
S. cerevisiae
Fermentation completion

Interactions: nutrients competition

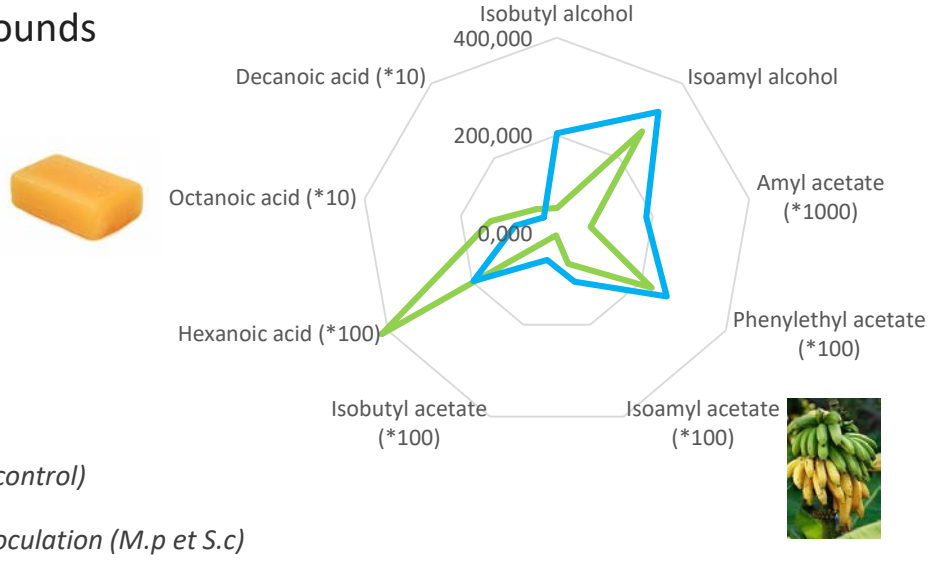
- Contribution of *M. pulcherrima* Flavia® for the production of aromas ?
- Assessment of nutrient requirements to ensure alcoholic fermentation ?

M. pulcherrima Flavia® in sequential inoculation with *S. cerevisiae* Lalvin QA23®

- Experimental conditions:



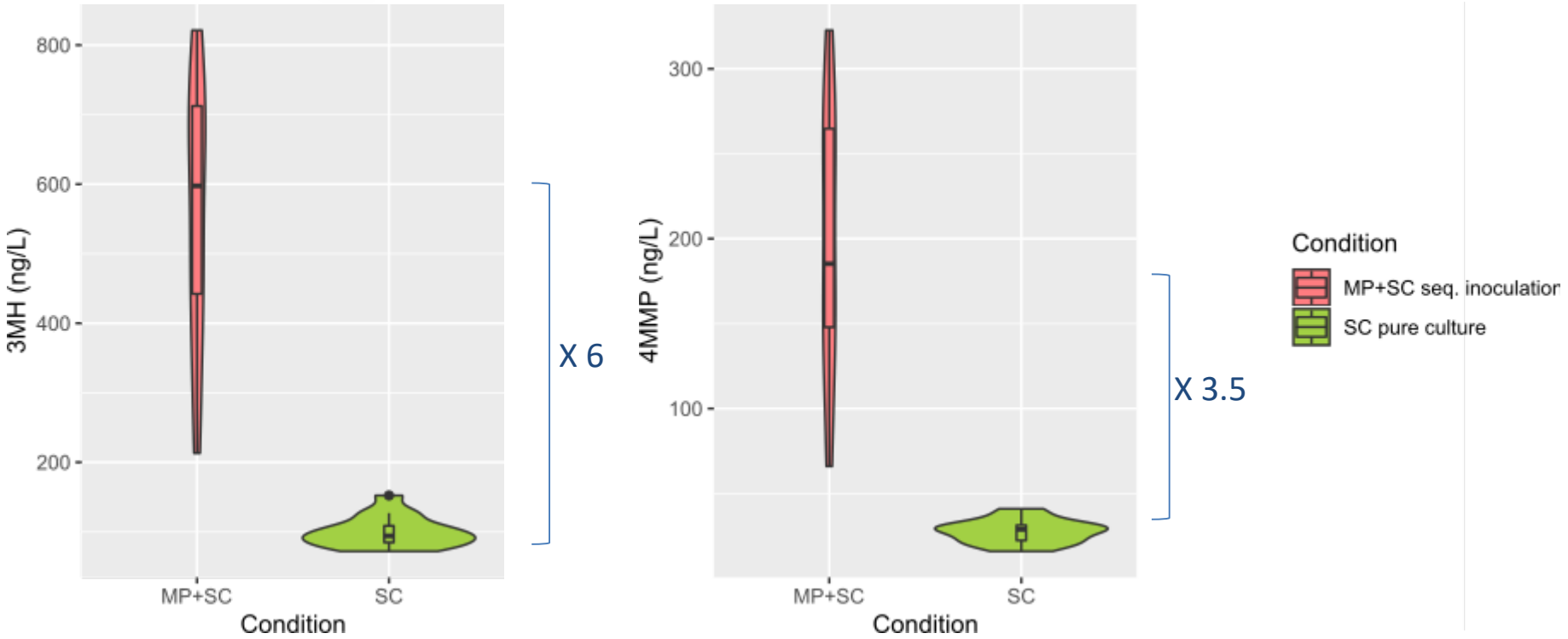
- Results: fermentative aroma compounds



- Characteristic profile of fermentative aromas production, with increased production of acetate esters derived from branched higher alcohols ➲ diversification of aroma profile of wines

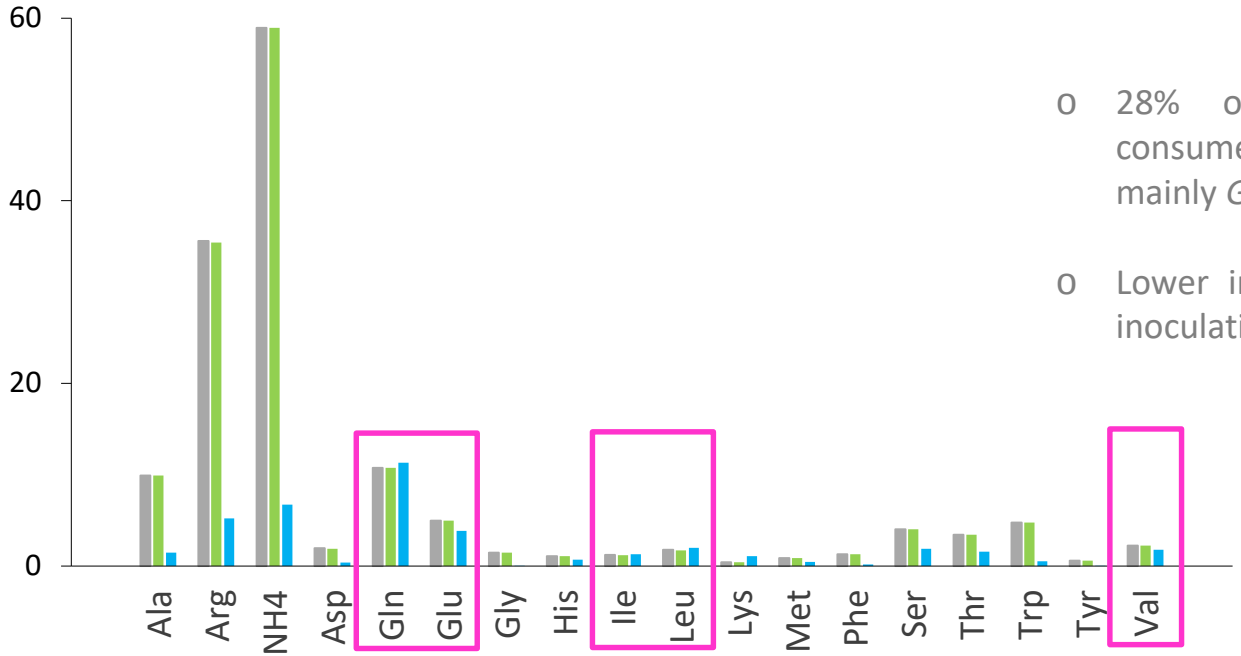
M. pulcherrima Flavia® in sequential inoculation with *S. cerevisiae* Lalvin QA23®

- Results: thiols



- Strong increase in the production of thiols in seq. inoculation with *M. pulcherrima* Flavia®

M. pulcherrima Flavia® nitrogen consumption characteristics



- 28% of yeast assimilable nitrogen consumed by *M. pulcherrima* in 48h: mainly *Glu, Gln and* amino acids branched
- Lower implantation of S.c in sequential inoculation

- Nitrogen sources prematurely consumed

➲ limitation for the *S.cerevisiae* development *?*

- Phenotypic diversity of non-*Saccharomyces* yeasts for the production of aromas to be exploited

- Management of nitrogen important in sequential inoculation for the alcoholic fermentation process. Co-cultures result in **interactions between the yeasts** with effect on the quality of the final product, on the production of positive aromas.

Thank you for your attention

Thanks to :

INRA - UMR SPO
Carole Camarasa
Audrey Bloem
Pascale Brial
Christian Picou

Pauline,
Vasilis,
Guillaume

Lallemand SAS
Anne Ortiz-Julien

Michel Brulfert

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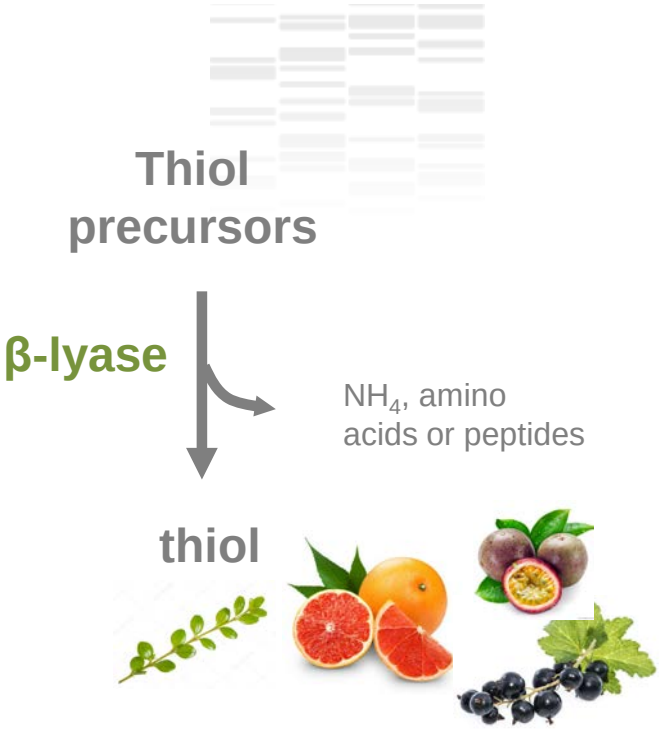
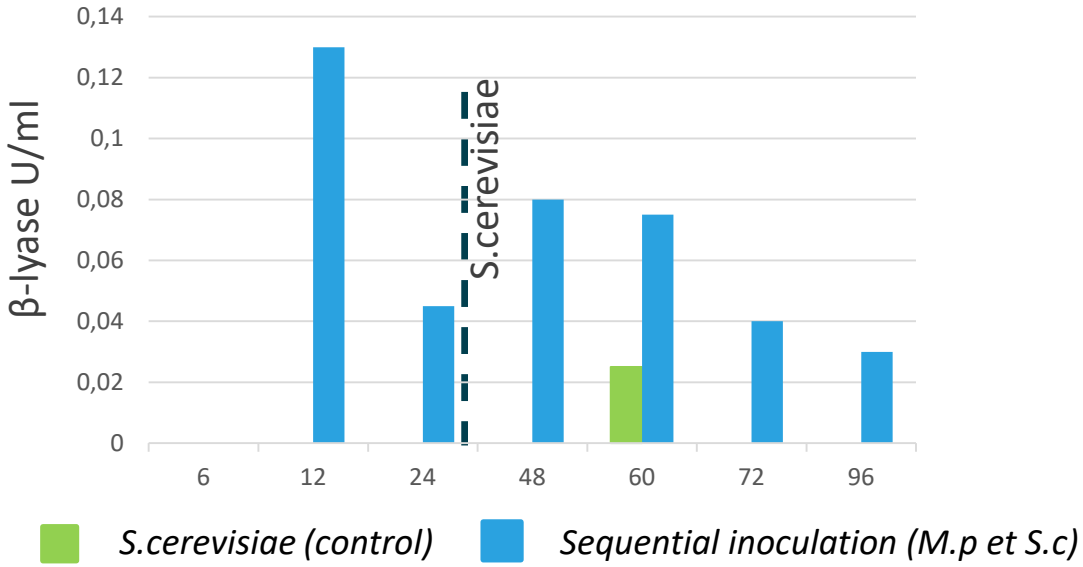
SCIENCE & IMPACT

M.pulcherrima Flavia®: A high ability to secrete hydrolytic enzymes

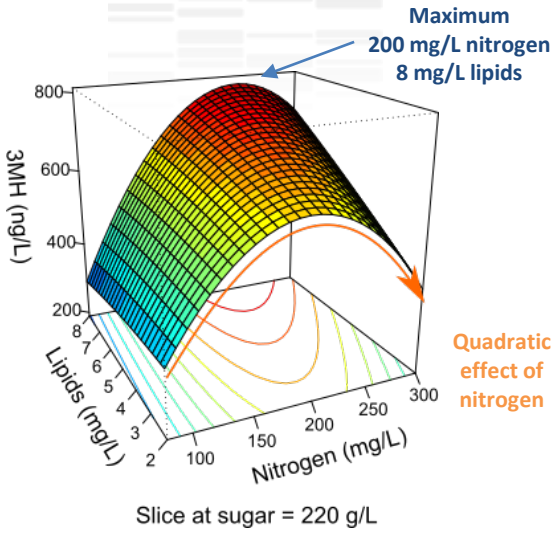


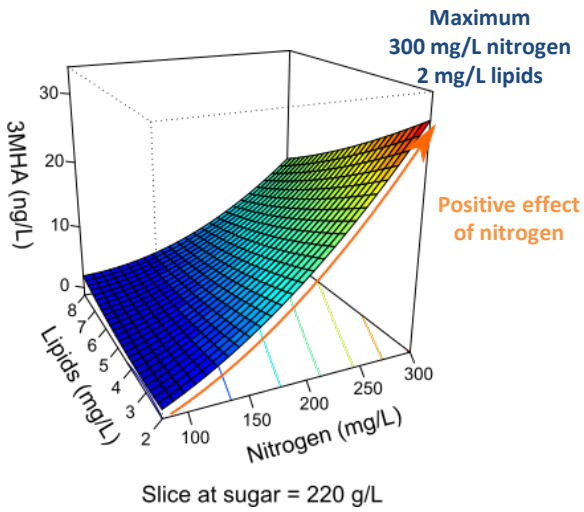


- Release of hydrolytic enzymes into the must, such as β-lyase which involved in the cleavage of thiol precursors ➲ diversification of aroma profile

Impact of must characteristics on *M.pulcherrima* Flavia® performances

Thiols





- 3MH and 4MMP : same shape
  = same liberation pathway

- 3MHA : different shape, close to acetate esters
  = similar production pathway

- Quadratic effect of nitrogen on the release of 3MH and 4MMP
- Positive effect of nitrogen on the production of 3MHA

3MHA production using similar mechanisms than the other acetate esters