



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

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

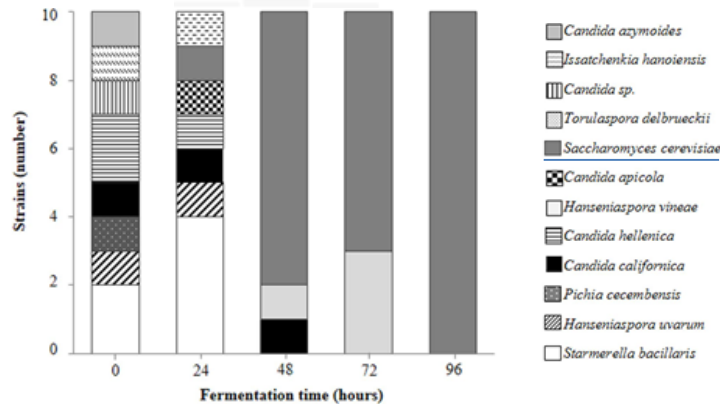
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A. Ortiz-Julien, M. Brulfert, C. Camarasa, A. Bloem*



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

Context: toward the diversification of enological yeasts

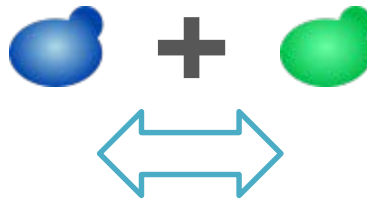
- Wide diversity of yeast species at the beginning of the fermentation
- But domination of *S. cerevisiae* at the end of FA



- 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



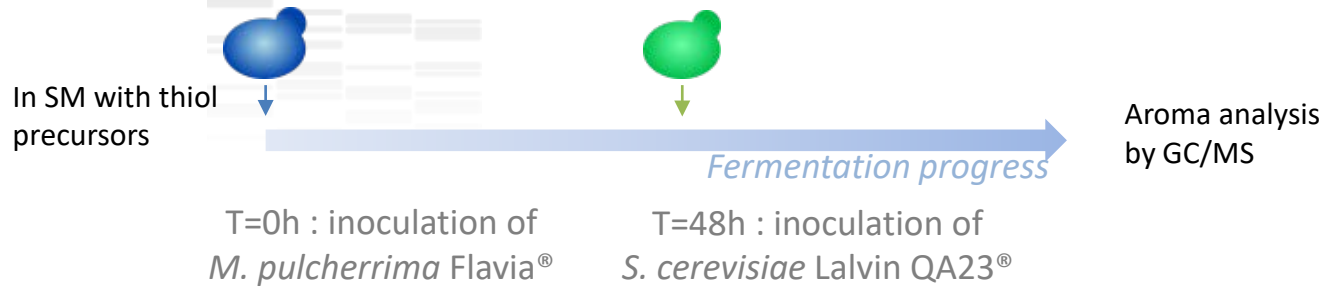
S. cerevisiae
Fermentation completion

Interactions: nutrients competition

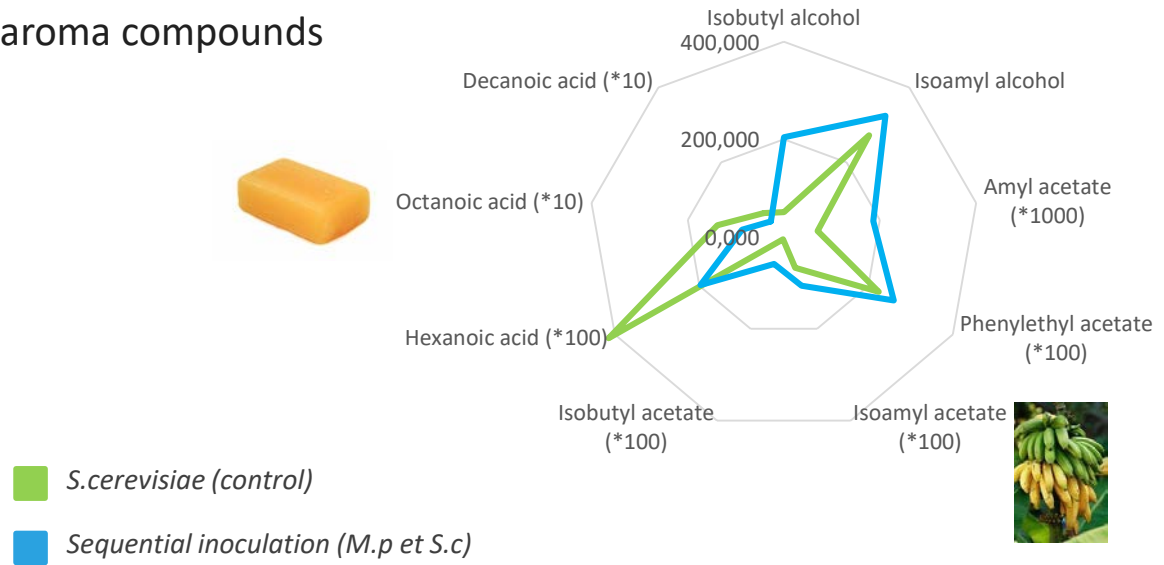
- Contribution of *M. pulcherrima* Flavia® for the production of aromas ?
- Assessment of nutrient requirements to ensure alcoholic fermentation ?

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

- Experimental conditions:



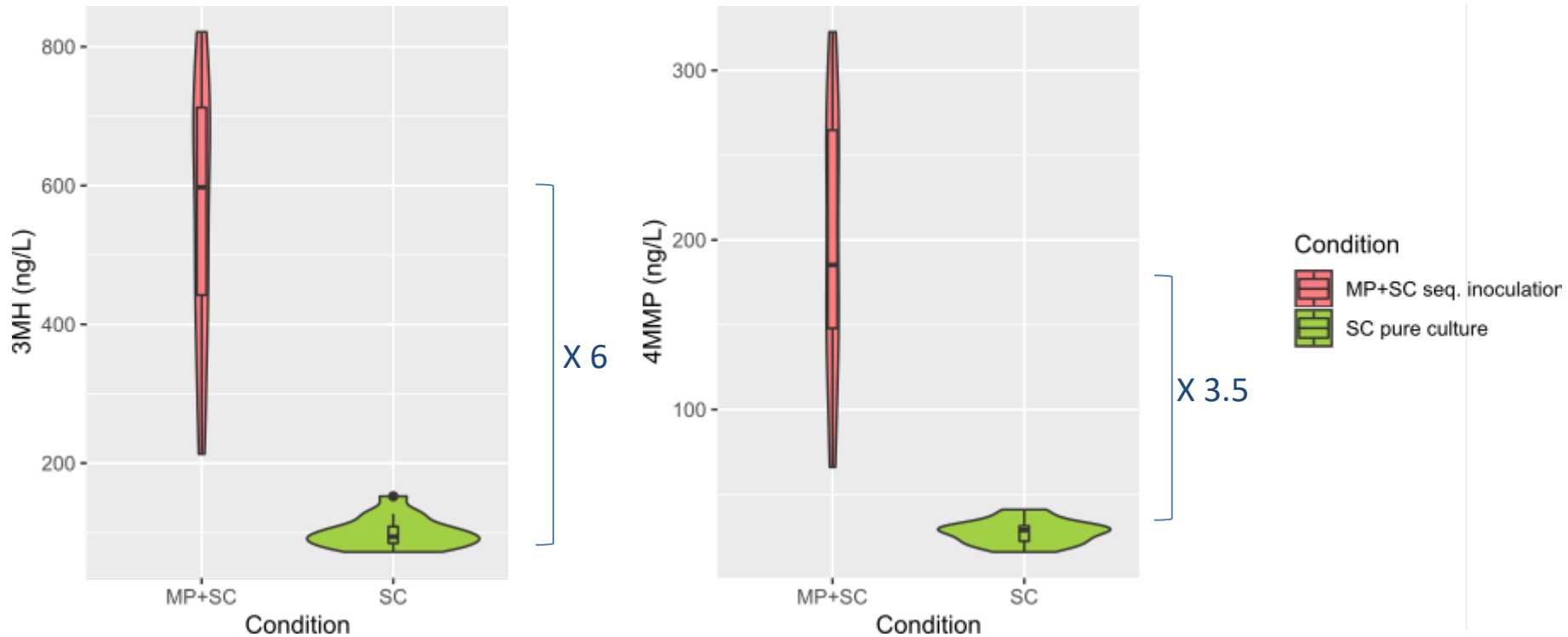
- Results: fermentative aroma compounds



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

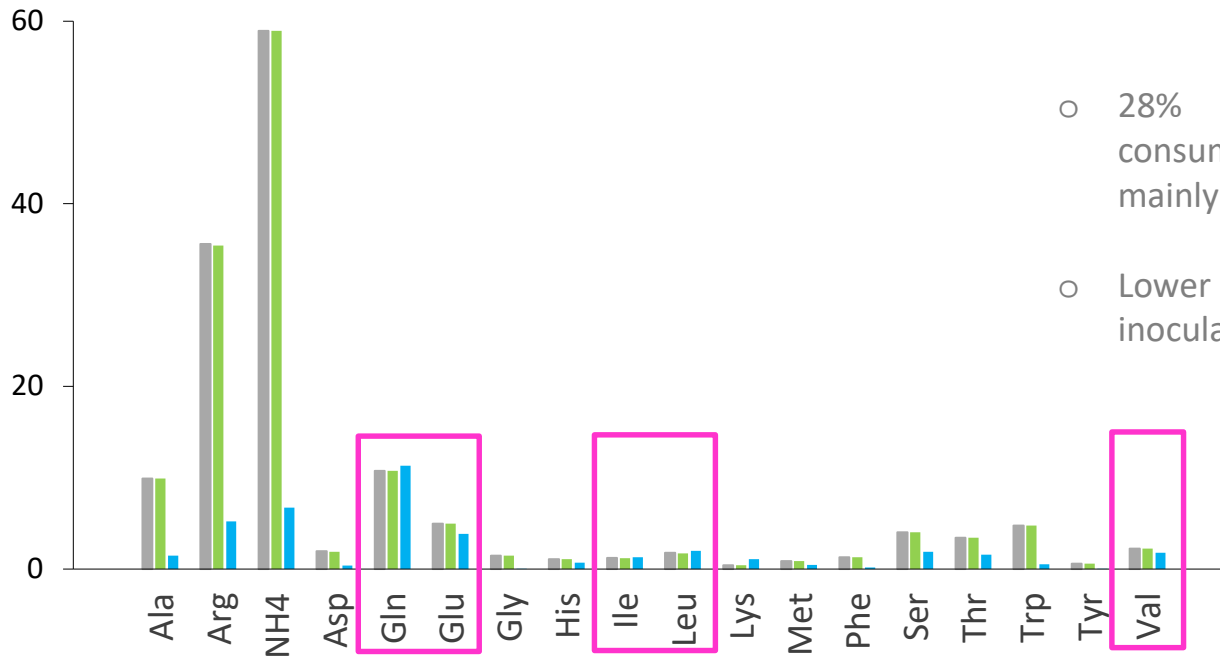
M. pulcherrima Flavia® in sequential inoculation with *S. cerevisiae* Lalvin QA23®

- 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 :



Pauline,
Vasilis,
Guillaume



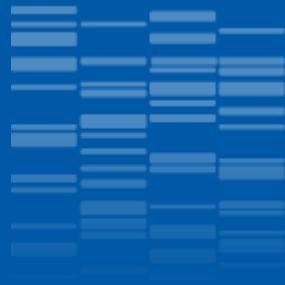
Lallemand SAS
Anne Ortiz-Julien



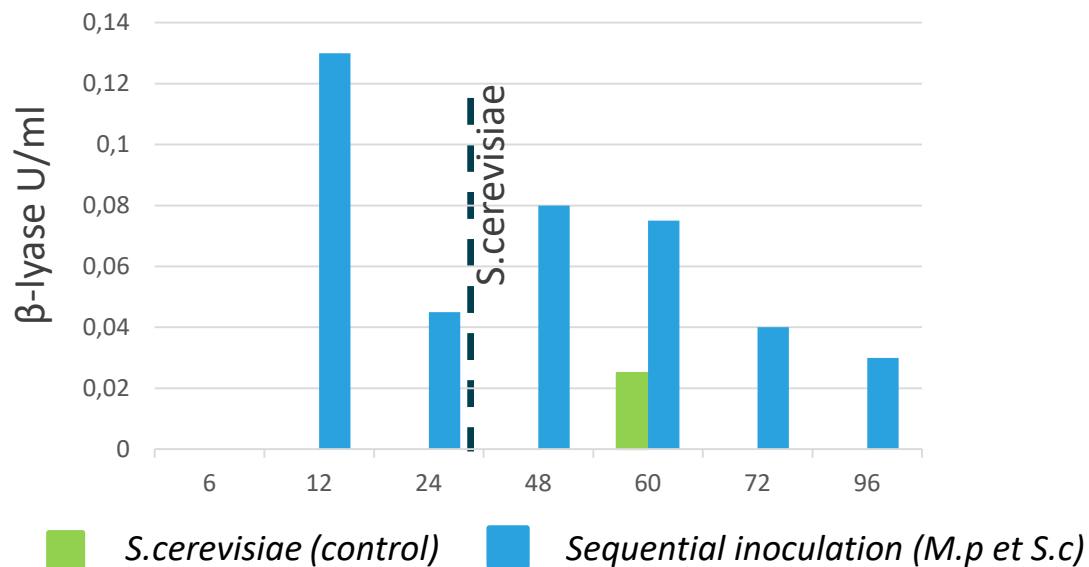
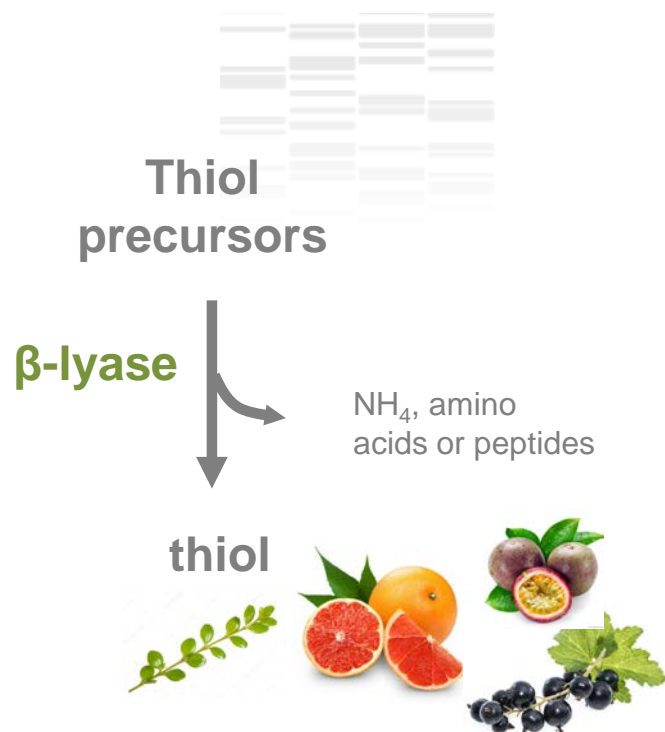
Michel Brulfert



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Audrey Bloem
Pascale Brial
Christian Picou



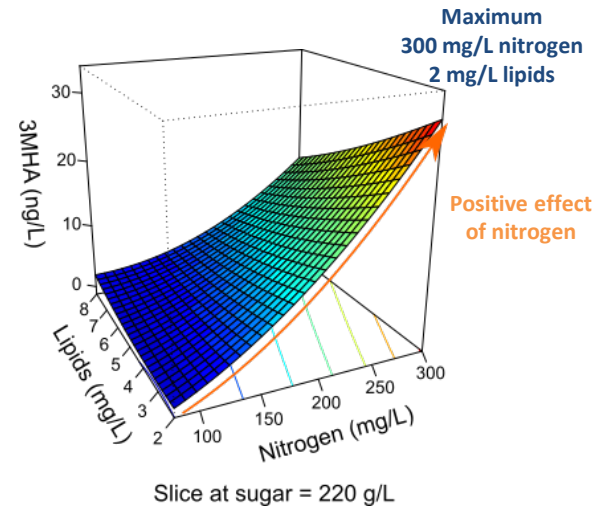
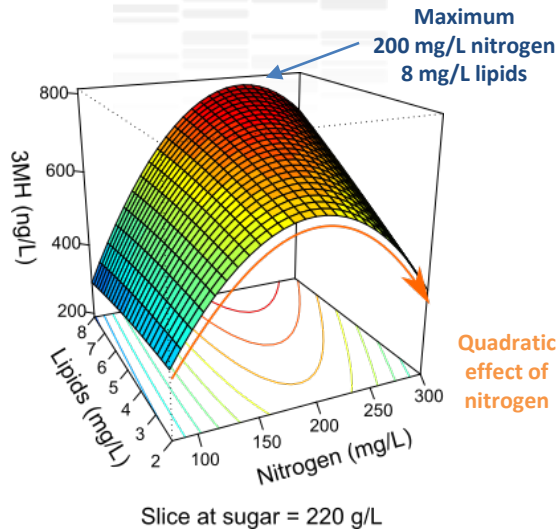
M.pulcherrima Flavia®: A high ability to secrete hydrolytic enzymes



- Release of hydrolytic enzymes into the must, such as β -lyase which involved in the cleavage of thiol precursors \rightarrow 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