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SCREENING OF LACTIC ACID BACTERIA WITH ABSORBANCE REDUCTION ACTIVITY METHOD (ARAM)

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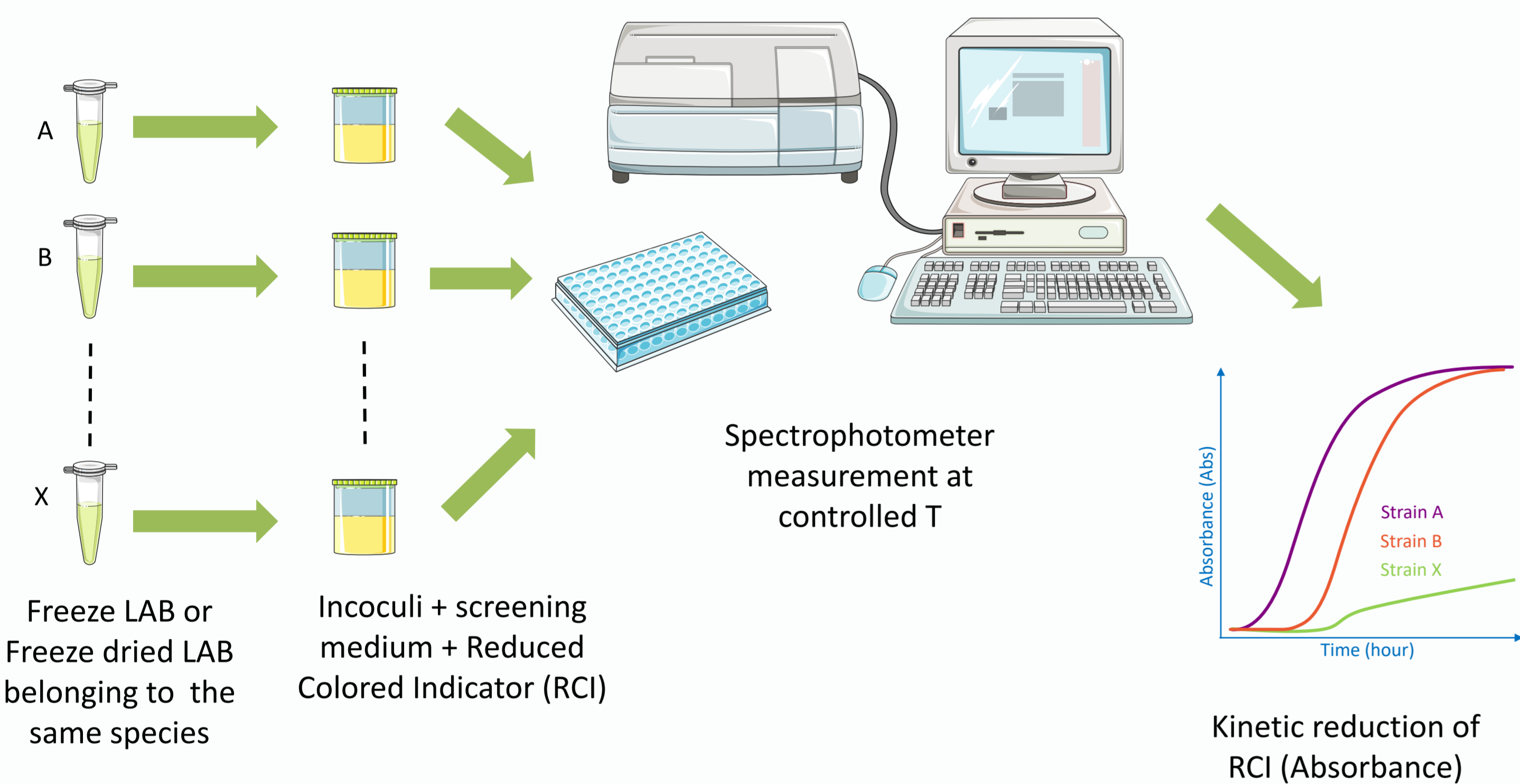
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INTRODUCTION

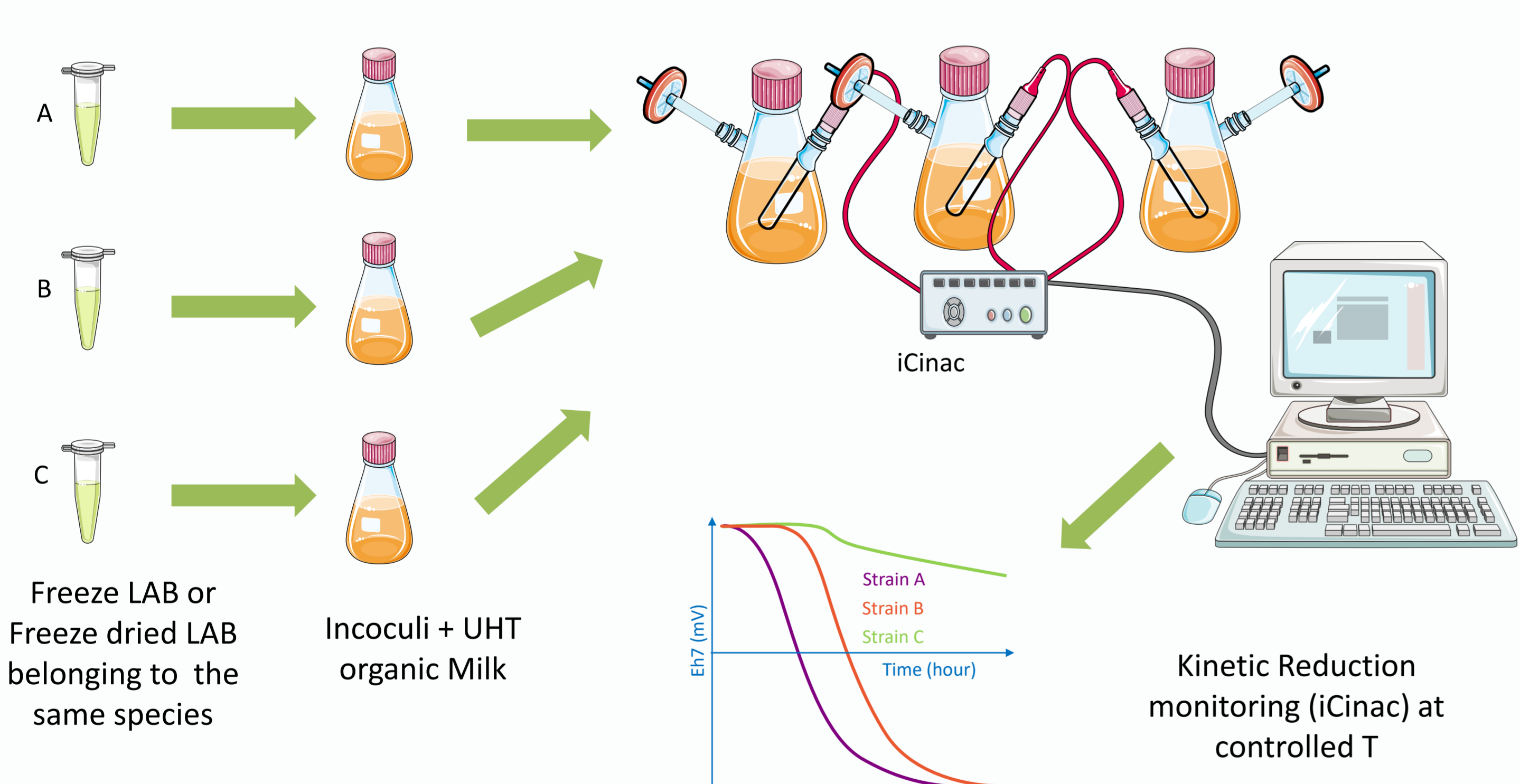
Lactic Acid bacteria (LAB) are widespread in the dairy industry for their use as starters and probiotics. They are able to reduce redox potential (E_h) of food matrices, influencing oxidation-reduction reactions involved in the organoleptic quality of the product and also preventing the development of undesired microflora. Amongst LAB, some species are able to reduce E_h below negative values while others do not^[1]. This diversity of reducing activity found in LAB allows the use of selected strains providing optimal reduction values necessary to the overall quality of food dairy products. Currently, there are different ways to compare LAB based on their reducing properties. Cachon *et al.*, 2002 proposed the Potentiometry Reduction Activity Method (PRAM) by monitoring E_h in liquid medium with redox probes, and the comparison of the maximum reduction rate (V_{max_r}), and the time to reach V_{max_r} . Michelon *et al.*, 2013 proposed the colorimetric Reduction CAPacity Method (ORCAM), a screening method on solid medium. This later takes advantage over PRAM to allow screening of a lot of strains in a short time. Nevertheless, this method is relatively non-discriminatory between LAB strains belonging to the same species. Consequently, we developed a new method, the Absorbance Reducing Activity Method (ARAM), in order to differentiate strains by keeping the simplicity of ORCAM but with the relevance of bacterial reduction kinetics obtained with PRAM. To validate this new screening method, PRAM using iCinac interface was carried out in parallel as reference method.

MATERIALS & METHODS

ARAM :



PRAM:



For both methods:

- All kinetics with the two different methods were performed in triplicate;
- All maximal reduction rate have been determined according to Cachon *et al.*, 2002;
- The data were statistically processed using Minitab software.

CONCLUSIONS

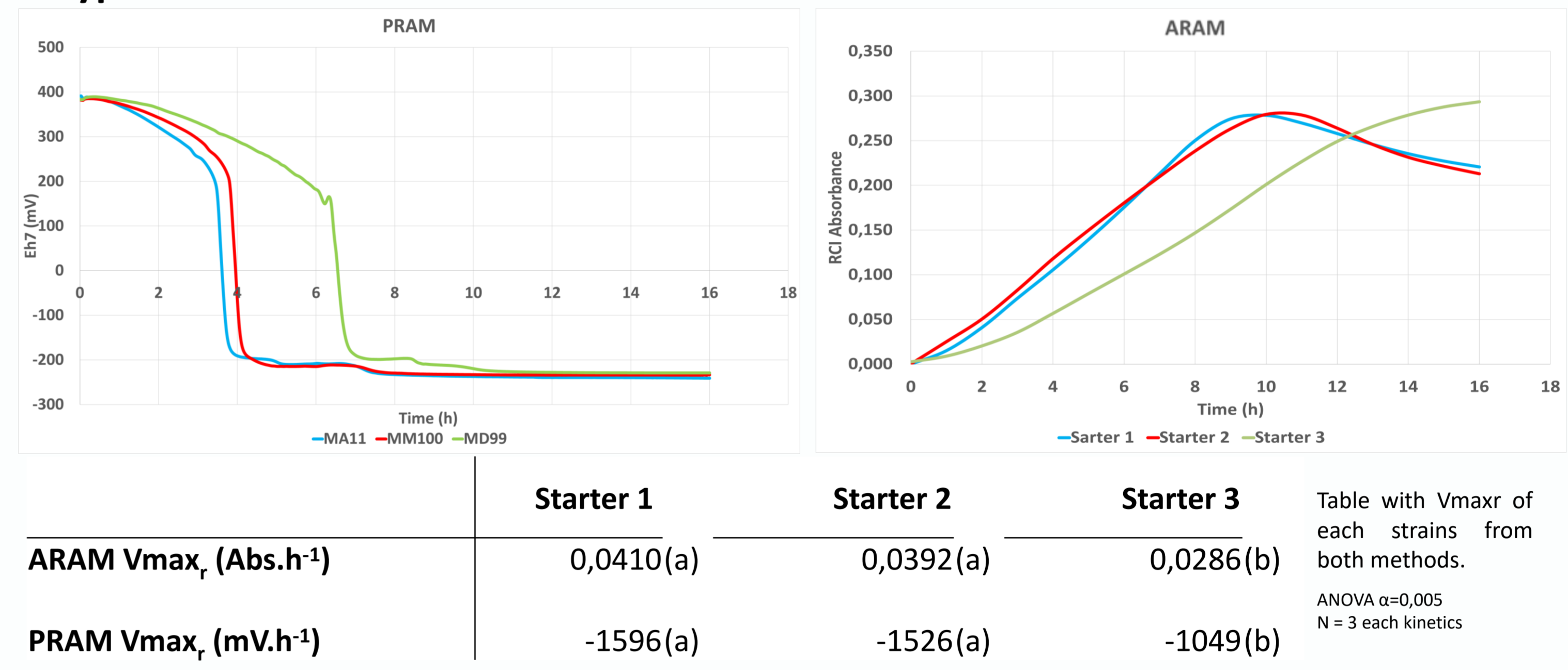
ARAM:

- allows intra-species bacteria comparison
- applicable from frozen or freeze-dried bacteria
- discriminate strains on their reduction kinetics
- compare until 30 strains simultaneously

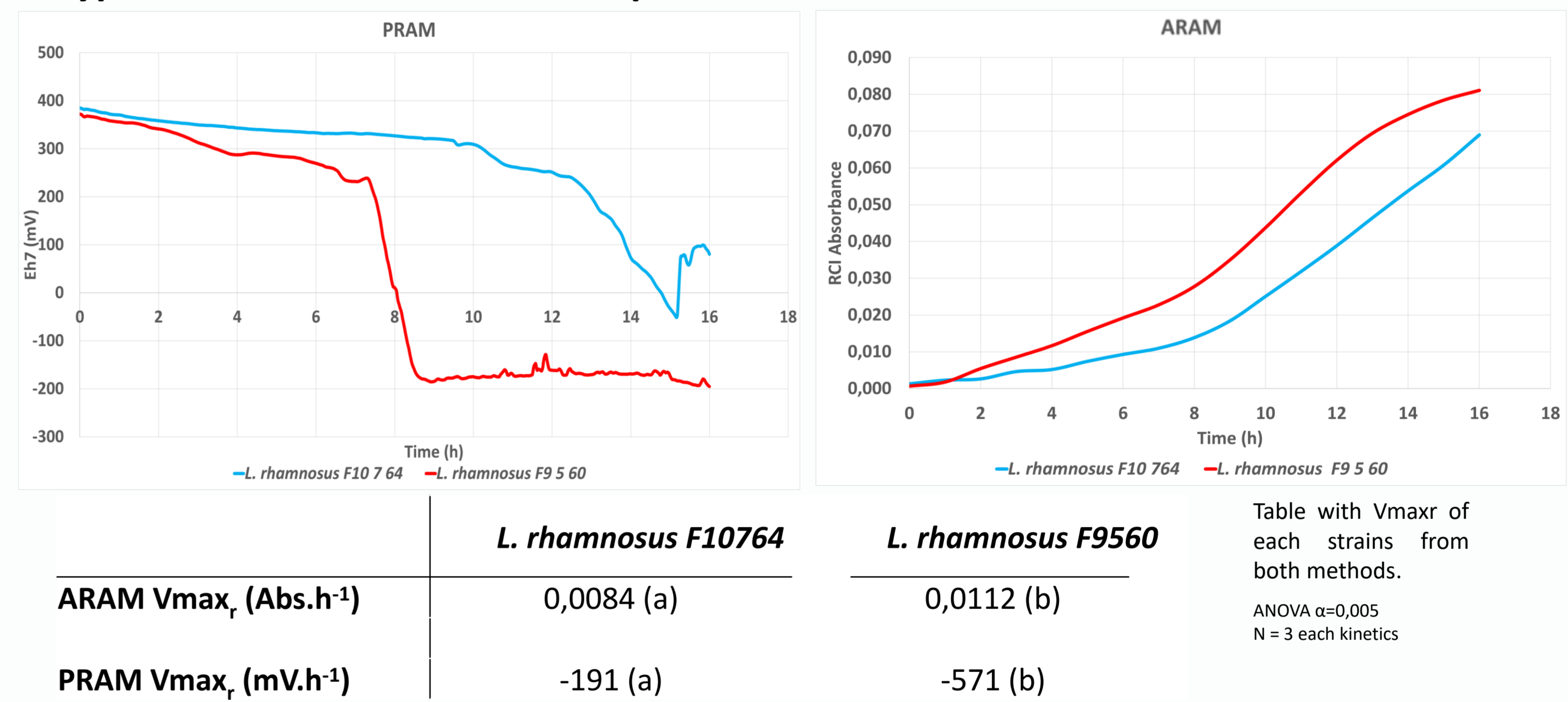
Currently, this method does not allow to compare strains from various species because it is depending of their ability to reduce the RCI.

RESULTS

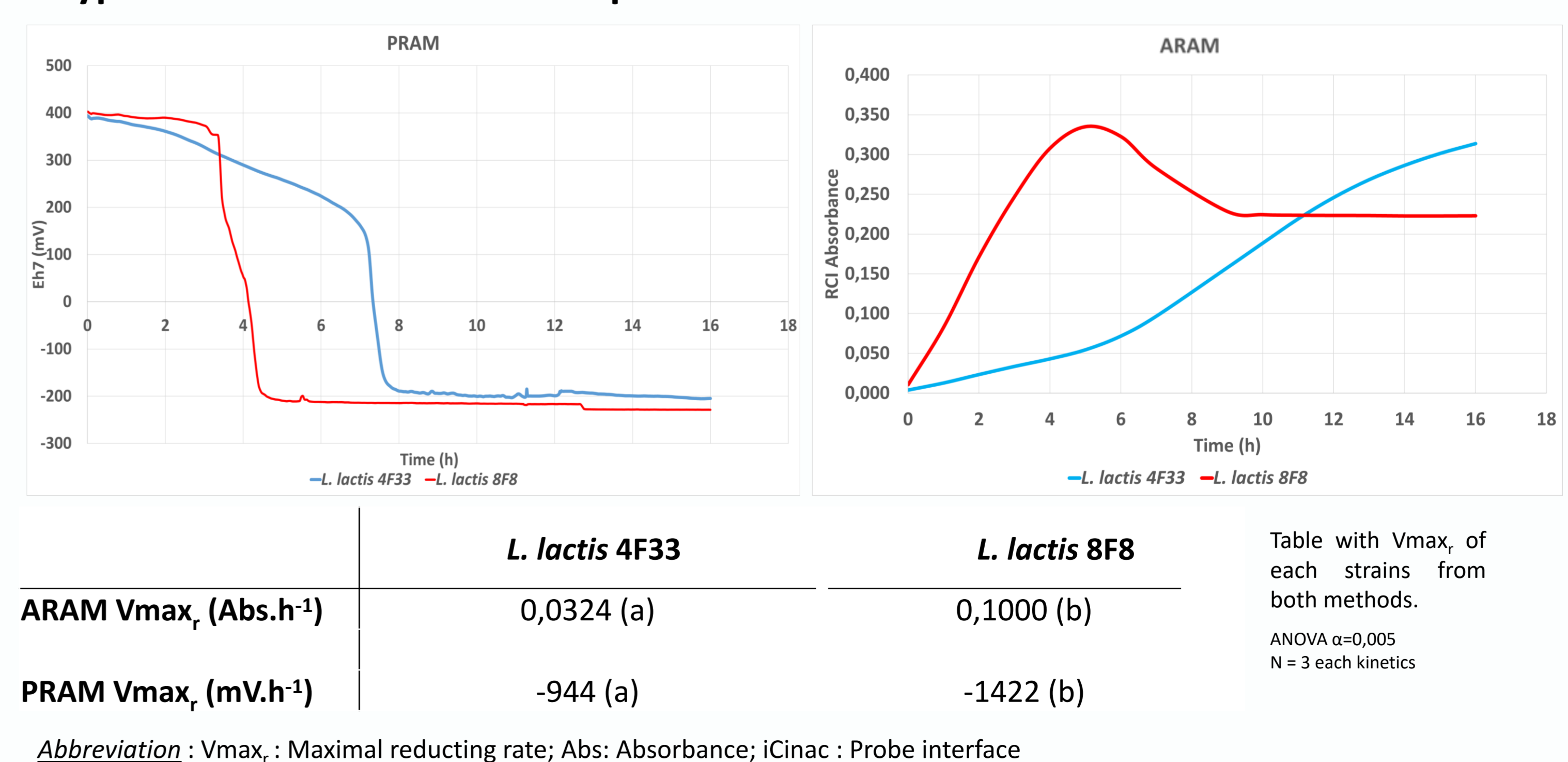
Typical curves of commercial cheese starters:



Typical curves of *Lactobacillus* species:



Typical curves of *Lactococcus* species :



Abbreviation : V_{max_r} : Maximal reducing rate; Abs: Absorbance; iCinac : Probe interface

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