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Jerome Ledauphin

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BIOPRESERVATION POTENTIAL OF *AEROCOCCUS* SP. STRAINS AGAINST COMMON PATHOGENIC AND SPOILAGE MICROORGANISMS OF FOOD

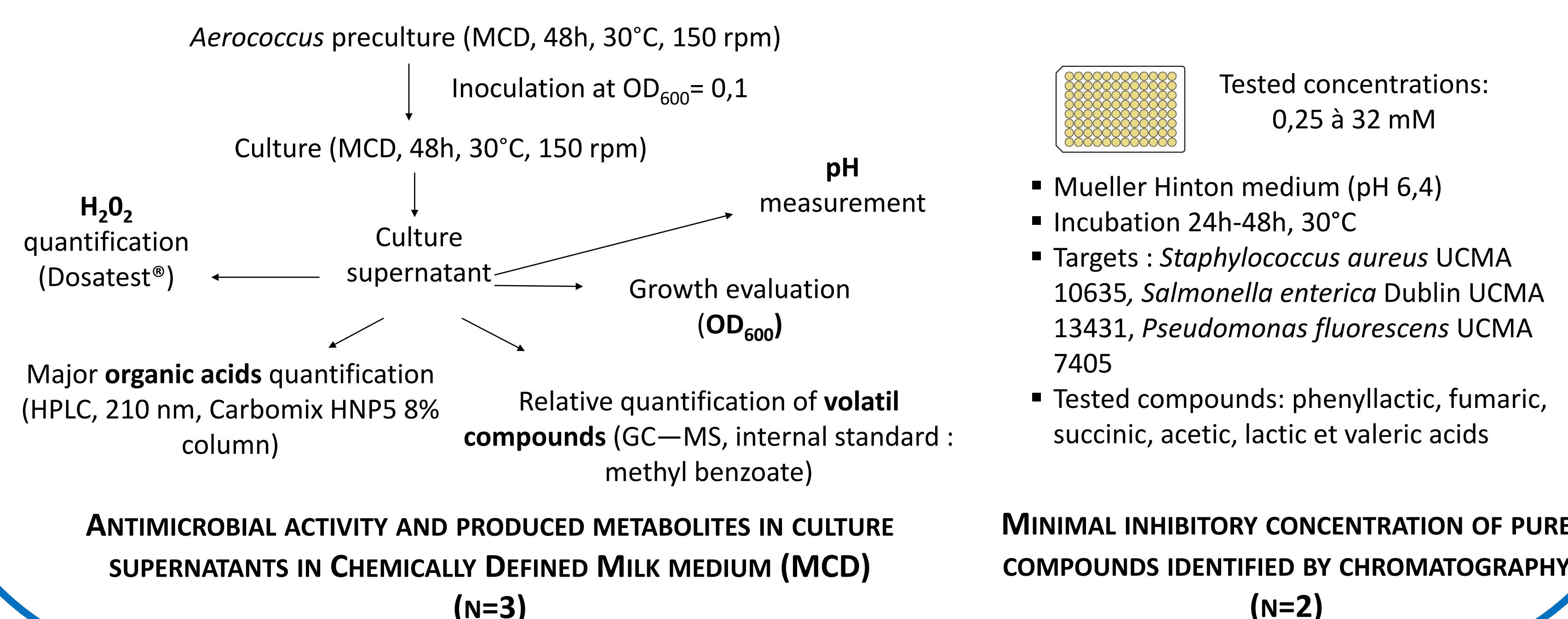
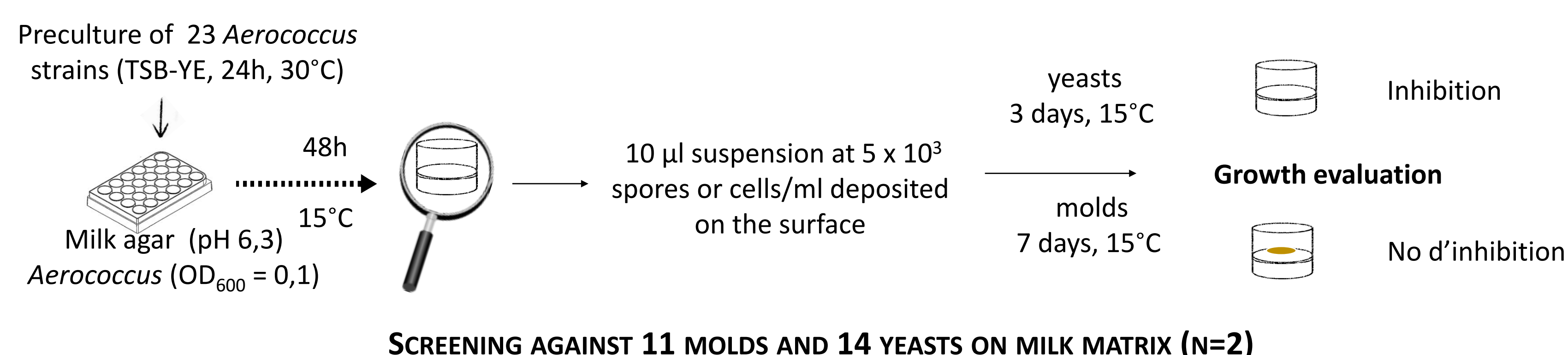
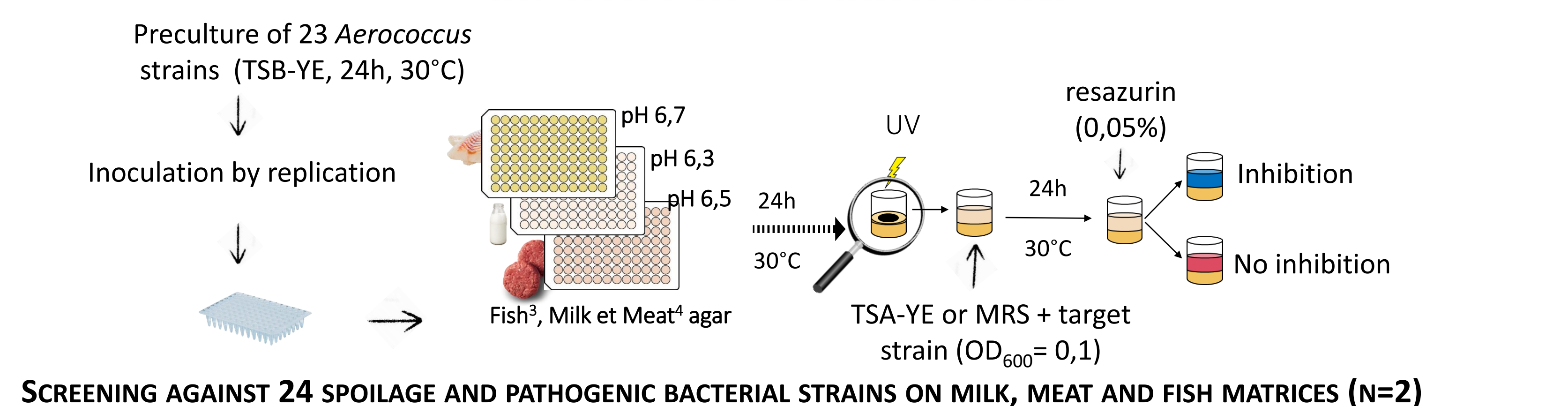
Margot Schlusshuber¹, Virginie Seguin², David Garon², Chloé Van Baelen¹, Abdoulaye Dieng^{1,3}, Jérôme Ledauphin³Normandie Univ, UNICAEN, UNIROUEN, ABTE, ¹MAliM, ²ToxEMAC, ³EcoTEA, 14000 Caen, France

Food preservation using microorganisms and/or their metabolites is a sustainable approach. It contributes to the reduction of food loss and waste due to undesirable microbial contamination as well as human contamination linked to foodborne pathogens. Potential of *Aerococcus* genus (lactic acid bacteria) is a source of bioprotective agents previously explored against *Salmonella* in dairy products [1] and against undesirable microbial flora in seafood [2]

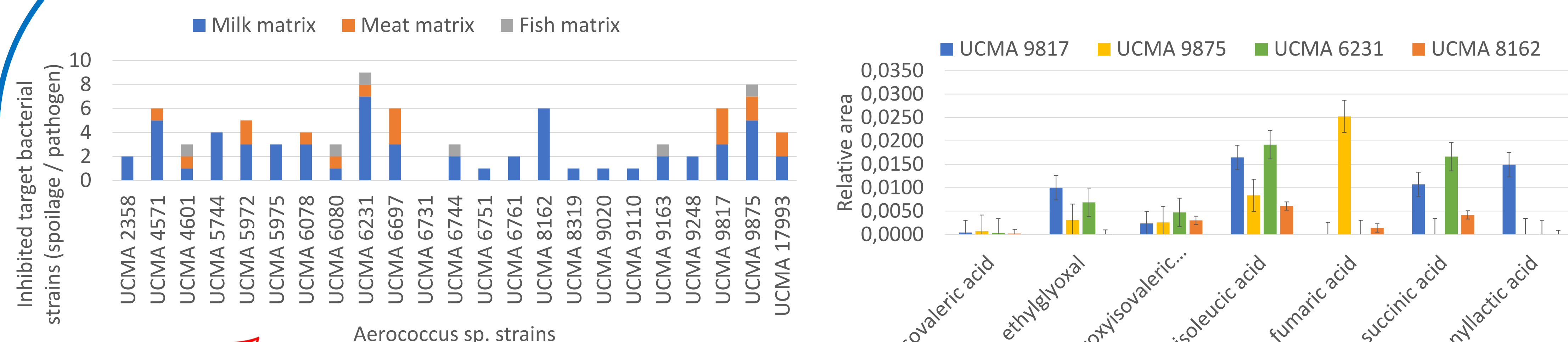
Objectives of the study

- Determine the potential of *Aerococcus* strains, isolated from dairy environment, on representative pathogenic and spoilage flora of meat, aquatic and dairy products
- Identify metabolites involved in the activity

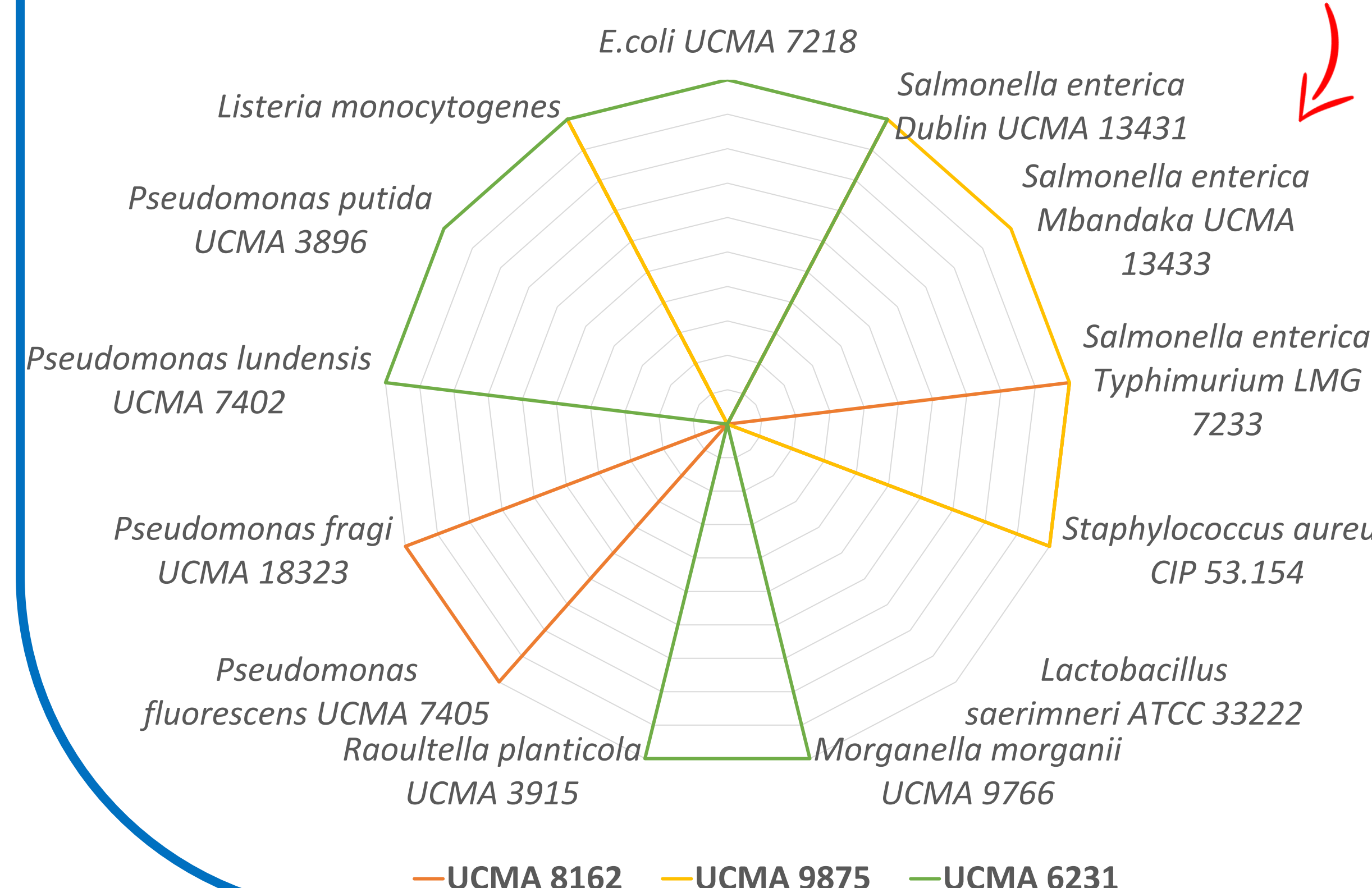
Materials & Methods



Main results

The inhibitory potential of *Aerococcus* strains is **better on milk matrix**

On milk matrix, inhibition spectra of **UCMA 8162, 9875 and 6231** strains are **complementary** for the **inhibition of pathogenic** bacteria (*S. enterica*, *S. aureus*, *E. coli*, *L. monocytogenes*), **spoilage** bacteria (*Pseudomonas* spp.) and **biogenic amines-producing** bacterial strains (*R. planticola*, *M. morganii*)



UCMA 9817, 8162, 9875 and 6231 strains mainly produce **organic acids**. The activity was confirmed for lactic, acetic, valeric, succinic and phenyllactic acids on three target bacterial strains (MIC 16 to 32 mM)

	pH	Lactic acid (mM)	Acetic acid (mM)
UCMA 8162	5,1	8,62 +/- 4,45	4,05 +/- 0,76
UCMA 9875	5,1	25,44 +/- 3,16	0
UCMA 6231	4,4	34,57 +/- 4,92	0
UCMA 9817	4,6	34,09 +/- 6,20	3,82 +/- 2,62

	molds	yeasts
UCMA 2358	0	ND
UCMA 4571	0	ND
UCMA 5744	0	0
UCMA 5972	0	ND
UCMA 6078	2	ND
UCMA 6080	1	0
UCMA 6231	0	0
UCMA 6697	0	ND
UCMA 6744	0	ND
UCMA 6761	0	0
UCMA 8162	0	0
UCMA 9248	2	ND
UCMA 9817	6	0
UCMA 9875	0	ND
UCMA 17993	1	0

ND, not determined

UCMA 9817 strain inhibits 6 molds strains (*Aspergillus fumigatus* CBS 116887, *Fusarium oxysporum* CMPG252, *Penicillium brevicompactum* CBS25729, *Penicillium chrysogenum* CBS30648, *Penicillium crustosum* CBS115503, *Penicillium commune* CBS261.29)

Conclusion & perspectives

This exploratory study confirms the food biopreservation potential of *Aerococcus* sp. strains from dairy environment, especially for dairy products. Four strains isolated from raw milk were selected on a milk matrix for their complementary antibacterial spectra (UCMA 8162, 9875 and 6231) as well as for their antifungal activity (UCMA 9817). Analysis of culture supernatants in MCD medium revealed that the strains produce the same volatile compounds but in different proportions, the UCMA 9817 strain being distinguished in particular by a higher production of 2-phenyllactic acid, known for its antifungal activity⁵. The putative synergistic action of the identified compounds remains to be explored to explain the different inhibition spectra observed for individual strains. In perspective, the possibility of using these strains in food will depend on the absence of biogenic amines production, no antibiotic resistance as well as favorable safety results (on *Galleria mellonella* larvae for example).

References :

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Contact :

margot.schlusshuber@unicaen.fr