ACETAIA SAN GIACOMO
NOVELLARA (RE) ITALIA

UNIMORE
UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA

Department of Life Sciences
University of Modena and Reggio Emilia

Industrial PhD in Agri-Food Sciences, Technologies and Bio-Technologies

XXXIII Cycle

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Tutor: Dr. Maria Gullo

Annual Workshop November, 30th 2018

PhD Project

Development of INNOVATIVE acetification **PROCESSES**

1

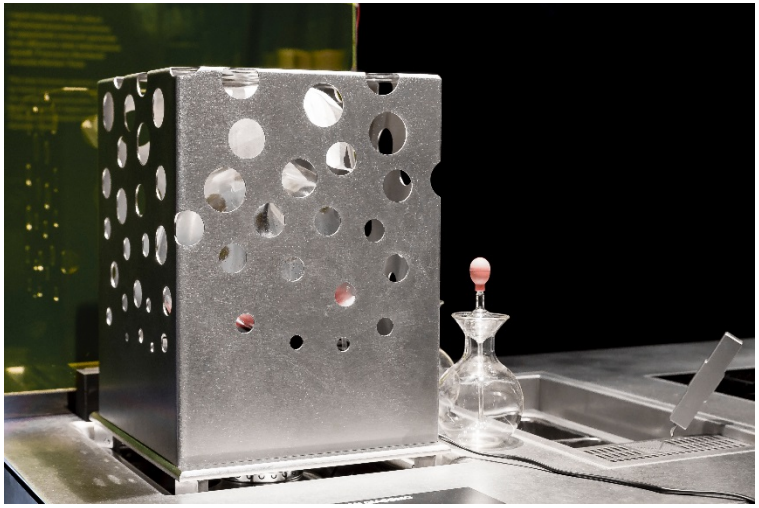
and

INNOVATIVE vinegar **PRODUCTS**

2

1

PROCESS → KIT for HOME and RESTAURANT PRODCUTION of vinegars



1° year

2

PRODUCT → focusing on UNCONVENTIONAL raw materials as fermentative substrate for acetic fermentations

2° year

2° YEAR FOCUS

Design and development
a new **sustainable** and **healthy**
BEVERAGE/CONDIMENT
combining
cheese whey
Kefir
kombucha tea

1

2

3

COMBINING SUSTANIBILITY WITH HEALTHY ATTRIBUTES

SUSTAINABILITY

Significant environmental impact
180/190 million of TON per year

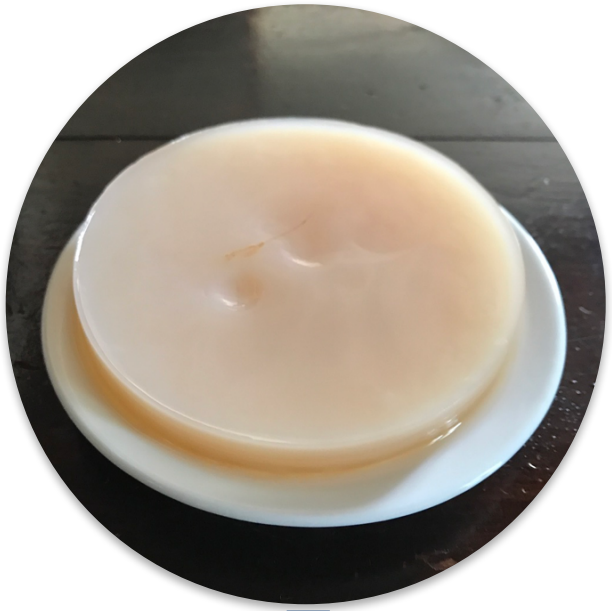
Only 50% processed

HEALTHY CHARATERISTICS

Not AlchoolicFunctional Fermented Beverage

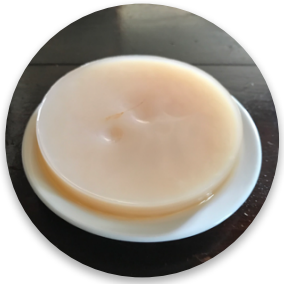
RAW MATERIALS

- Pick up from a local dairy immediately after the cheese production
- Refrigeration
- Microbiological analysis → low microbiological load



- Commercial Black Tea + starter + sacrose
- 20 days culture

TEST 1

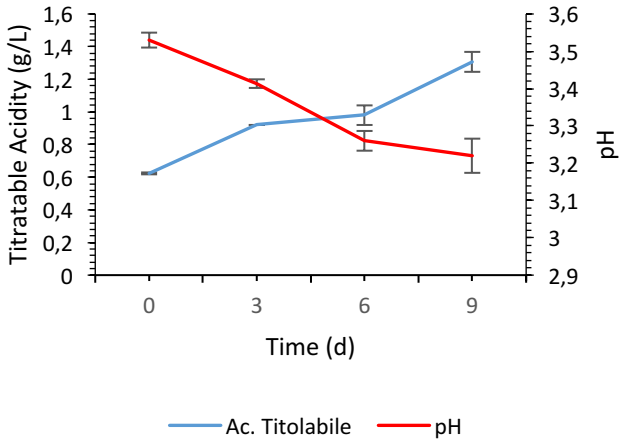


Trial 1

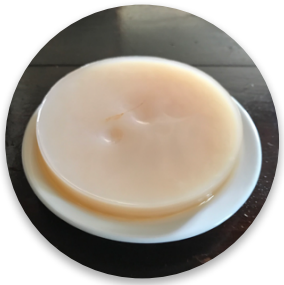
1 : 1

15 days
28 °C

TIME (days)	SAMPLE N°	pH	TITRATABLE ACIDITY (g/L)
0	1	3.51	0.62
	2	3.55	0.63
	3	3.53	0.62
3	1	3,42	0,92
	2	3,42	0,92
	3	3,40	0,92
6	1	3,28	0,92
	2	3,27	1,04
	3	3,23	0,98
9	1	3,23	1,24
	2	3,26	1,36
	3	3,17	1,32



TEST 2

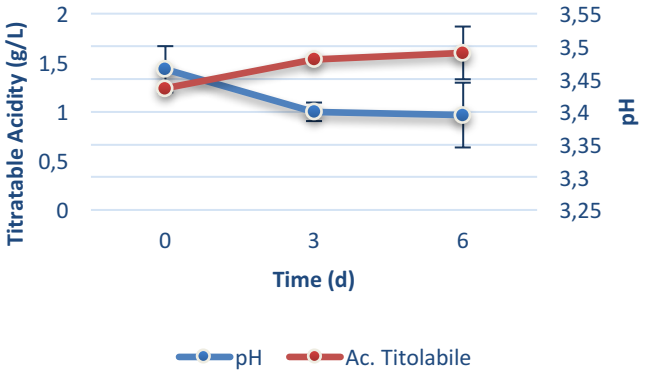


Trial 1

Trial 2

7 days
28 °C

TIME (days)	SAMPLE N°	pH	TITRATABLE ACIDITY (g/L)
0	1	3,49	1,24
	2	3,44	1,24
3	1	3,39	1,54
	2	3,41	1,53
6	1	3,36	1,79
	2	3,43	1,41



TEST 3

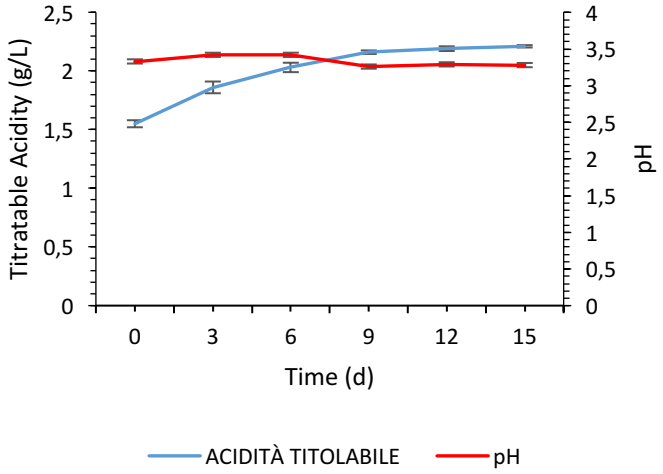
Trial 2 + **A selected strain (K2G30) used as starter**

K2G30	
Isolated from	Kombucha tea
Growth modality in solid medium	Cellulosic
Growth modality in broth	Multilayer
$CaCO_3$ consumption	+
Acetic acid production	+
BC production	+
CB (g/L) in GY broth	23,19 g/L
Safely deposited at UMCC	UMCC2756
Species	*K. xylinus*

Trial 3

15 days
28 °C

Time (days)	pH	Titratable acidity (g/L)
0	3.33 ± 0.02	1.55 ± 003
3	3.42 ± 0.015	1.86 ± 005
6	3.42 ± 0.02	2.03 ± 0.04
9	3,26 ± 0.025	2.16 ± 0.015
12	3.29 ± 0,01	2.19 ± 0.02
15	3.28 ± 0.02	**2.21 ± 0.01**



CONCLUSIONS AND PERSPECTIVES

- ✓ The selected raw materials (cheese whey, kombucha tea and kefir) possesses fermentative attitude to be used in fermented non-alcoholic beverages development.

- ✓ The strategy used in this study allowed the production of a fermented non-alcoholic beverage having optimal basic fermentation

- ✓ **These preliminary results show that an innovative beverage that combines sustainability with health attributes can be obtained from kombucha tea, cheese whey, kefir culture and a selected strain (K2G30).**

- ✓ **Further studies are aimed to establish parameters for obtaining a drink or a food condiment and to optimize processes conditions.**

THANKS TO
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