





Unimore Microbial Culture Collection as a bioresourse for the industrial exploitation of Acetic Acid Bacteria

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UMCC is the Microbial Culture Collection of the University of Main compounds produced by acetic acid bacteria and their application *

Chemical compound - Key enzyme

Biotechnological Organism

Modena and Reggio Emilia (<u>www.umcc.unimore.it</u>)

Internationally recognized collection specialised in: selection of microorganisms for both academic and industrial purposes

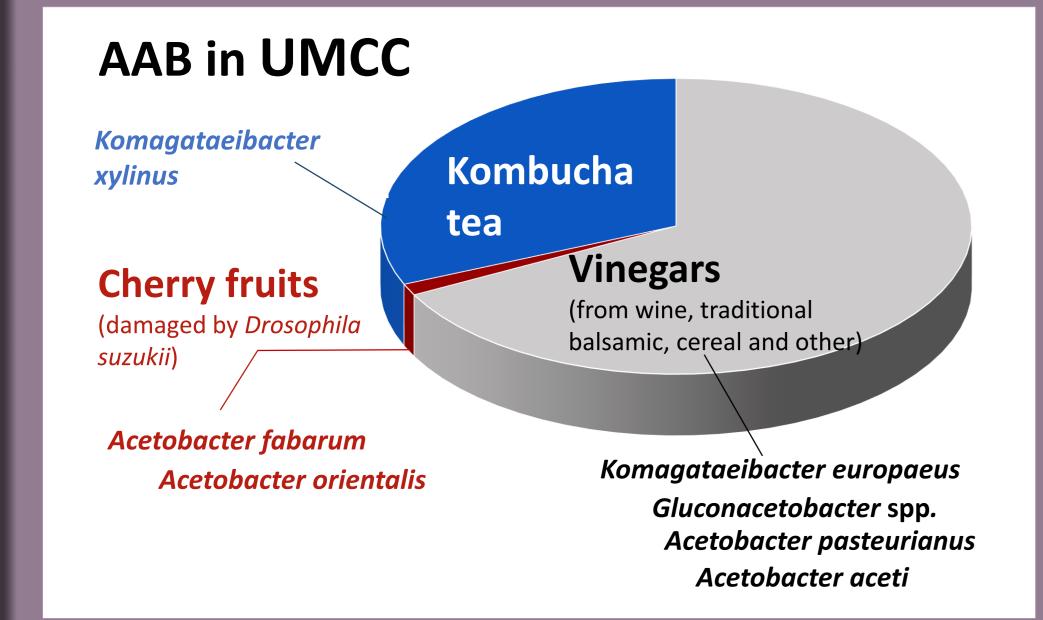
✓ Organisms:

yeasts, acetic acid bacteria ad lactic acid bacteria

 Partner of the Italian network of microbial resources collections (Joint Research Unit MIRRI-IT; www.mirri-it.it)

	- Precursor compound	application	
Acetic acid	-ALDH [EC 1.2.1]	Food, chemical	Acetobacter spp., Gluconacetobacter
$(C_2H_4O_2)$	-Acetaldehyde		spp., Komagataeibacter spp.
Glucono-δ-lactone	-PQQ-GDH [EC 1.1.5.2]	Food, pharmaceutical, chemical	Gluconobacter spp., Acetobacter spp.
(C ₆ H ₁₀ O ₆)	-Glucose		
2-keto-D-gluconate	-FAD-GADH [EC 1.1.99.3]	Food, pharmaceutical, chemical	Gluconobacter spp., Acetobacter spp.
(C ₆ H ₁₀ O ₇)	-Gluconic acid		
5-keto-D-gluconate	-PQQ-GLDH [EC 1.1.99.22]	Food, pharmaceutical, chemical	Gluconobacter spp., Acetobacter spp.
(C ₆ H ₁₀ O ₇)	-Gluconic acid		
2,5-diketo-D-gluconate	-2KGADH [EC 1.1.99.4]	Food, pharmaceutical, chemical	Gluconobacter spp., Acetobacter spp.
(C ₆ H ₈ O ₇)	-2-keto-gluconate		
L-sorbose	-PQQ-GLDH [EC 1.1.99.22]	Pharmaceutical, cosmetic, food	Gluconobacter spp., Acetobacter spp.
(C ₆ H ₁₂ O ₆)	-D-sorbitol		
L-Sorbosone	-FAD-SDH [EC 1.1.99.12]	Pharmaceutical, cosmetic, food	Gluconobacter spp., Acetobacter spp.
(C ₆ H ₁₀ O ₆)	-L-Sorbose		
2-keto-L-gulonate	-SNDH [EC:1.1.1]	Pharmaceutical, cosmetic, food	G. oxydans
(C ₆ H ₁₀ O ₇)	-L-sorbosone		
Dihydroxyacetone	-PQQ-GLDH [EC 1.1.99.22]	Pharmaceutical, chemical,	G. oxydans
$(C_3H_6O_3)$	-Glycerol and other polyols	cosmetic	
Cellulose	-CS [EC 2.4.1.12]	Food, biomedical, cosmetic,	Komagataeibacter spp.,
$(C_6H_{10}O_5)_n$	-UDP-glucose	engineering	Gluconacetobacter spp.
Levan	-LS [EC 2.4.1.10]	Food, medical, pharmaceutical	Gluconobacter spp., Neoasaia spp.,
(C ₁₈ H ₃₂ O ₁₆)	-Fructose		Kozakia spp., Gluconacetobacter spp.

* Adapted from La China et al 2018; De Vero et al 2010

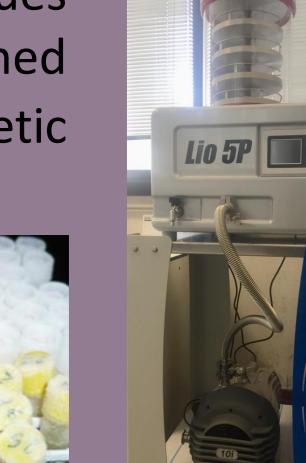


UMCC

- Combines phenotypic and molecular traits with industrial strain performance
- Assesses the technological stability of industrially useful strains
- Offers innovative research and scientific services to customers and stakeholders for novel and functional starter cultures

Suitable preservation techniques and quality control are performed in **UMCC** in order to avoid genetic drift and phenotypic changes





UMCC – Current applied research







(Gullo et al 2017; 2018)







Standardized and integrated information on the AAB are recorded in the **UMCC** Database available on line at: http://umcc.bio-aware.com/



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