

*Florilège : une base de données
de phénotypes microbiens
d'intérêt agro-alimentaire.*



Qualité
sensorielle



Structure
de l'aliment



Technologies et procédés
agroalimentaires



Qualité nutritionnelle
et effets sur la santé

Contexte et grands enjeux



Aliment fermentés :
Du traditionnel à l'innovation...
Quelles espèces/souches associer ?



Etat de l'art

Le casting des souches ...



Composition matière première



Procédés



Acidification
 Texture
 Production d'arômes ...

Résultats phares

Florilège : une mine d'informations pour bien choisir les souches



Florilege, a database gathering microbial habitats, phenotypes and uses

[Home](#)
[Taxon lives In Habitat](#)
[Habitat may be inhabited by Taxon](#)
[Taxon exhibits Phenotype](#)
[Phenotype Is exhibited by Taxon](#)
[Taxon studied for Use](#)
[Use Involves Taxon](#)
[Advanced search](#)
[About Florilege](#)

- food for human
 - commodity and primary derivative
 - meal
 - part of food
 - prepared food
 - processed commodity and food
 - defrosted food
 - ground food
 - home-made food
 - mashed food
 - milled food
 - prepared meat
 - preserved food
 - canned food
 - concentrated food
 - cooked food
 - cooled food
 - dried food
 - fermented food
 - fermented fish product
 - fermented meat
 - fermented dairy product
 - fermented seafood
 - fermented liquid
 - fermented cereal-based
 - fermented plant-based
 - frozen food

Source

PubMed
 GenBank
 CIRM
 DSMZ

Taxon

QPS only

SOURCE TEXT	HABITAT	RELATION TYPE	TAXON	QPS	SOURCE
10356792	soy milk	may be inhabited by	Enterobacter cloacae		PubMed
17995840	soy milk	may be inhabited by	Enterococcus durans		PubMed
28726509	soy milk	may be inhabited by	Enterococcus faecalis		PubMed
18388479, 22978423, 12942871	soy milk	may be inhabited by	Enterococcus faecium		PubMed
15925711	soy milk	may be inhabited by	Escherichia coli		PubMed
25887264	soy milk	may be inhabited by	Escherichia coli O111		PubMed
28726509	soy milk	may be inhabited by	Escherichia faecalis		PubMed
12452966	soy milk	may be inhabited by	Helicobacter pylori		PubMed
20492305, 15135959, 19961357	soy milk	may be inhabited by	Lactobacillus acidophilus	<input checked="" type="checkbox"/>	PubMed
21779970, 23871367, 18211356	soy milk	may be inhabited by	Lactobacillus casei	<input checked="" type="checkbox"/>	PubMed
10356792	soy milk	may be inhabited by	Lactobacillus delbrueckii	<input checked="" type="checkbox"/>	PubMed
20492305, 24495115, 20477889	soy milk	may be inhabited by	Lactobacillus delbrueckii subsp. bulgaricus		PubMed
22149599, 19961357, 19584552	soy milk	may be inhabited by	Lactobacillus		PubMed
21775184, 22305107, 18230145	soy milk	may be inhabited by	Lactobacillus fermentum	<input checked="" type="checkbox"/>	PubMed
21775184, 19961357	soy milk	may be inhabited by	Lactobacillus gasseri	<input checked="" type="checkbox"/>	PubMed
25892687	soy milk	may be inhabited by	Lactobacillus helveticus	<input checked="" type="checkbox"/>	PubMed
19216552	soy milk	may be inhabited by	Lactobacillus paracasei	<input checked="" type="checkbox"/>	PubMed
15662546, 19216552	soy milk	may be inhabited by	Lactobacillus paracasei subsp. paracasei		PubMed
29318897, 18388479, 17995840	soy milk	may be inhabited by	Lactobacillus paraplantarum	<input checked="" type="checkbox"/>	PubMed
22591404, 27784227, 27873546	soy milk	may be inhabited by	Lactobacillus plantarum	<input checked="" type="checkbox"/>	PubMed

Florilège : une mine d'informations pour bien choisir les procédés



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Search relations by taxon

[TSV Download](#)[Filter Selection](#)

4 relations for the taxon Lactobacillus

Phenotype

 QPS only[Apply](#)

SOURCE TEXT	TAXON	RELATION TYPE	PHENOTYPE	QPS	SOURCE
9057296, 11155131	Lactobacillus acidophilus	Exhibits	thermophile	✓	PubMed
11916708, 11938463, 18842314	Lactobacillus delbrueckii	Exhibits	thermophile	✓	PubMed
11916708, 25615964	Lactobacillus fermentum	Exhibits	thermophile	✓	PubMed
18032033, 18842314, 26384211	Lactobacillus helveticus	Exhibits	thermophile	✓	PubMed

⏪ ⏩ 1-4 of 4 ⏪ ⏩

Fouille de texte et ontologies



period, yeasts (primarily *Debaryomyces hansenii* for semi-soft cheeses and additionally *Geotrichum candidum* for soft cheeses) and coagulase-negative staphylococci (*Staphylococcus equorum*) are present [3, 21, 26]. Generally, *D. hansenii* and staphylococci on cheese surface are assumed to originate from the cheese brine which often is not changed or pasteurised between salting of different batches [2, 3, 42]. For *D. hansenii*, Petersen et al. [46] showed that the dominating *D. hansenii* strain on cheeses of the Danish Danbo type did not originate from the added ripening culture, but from the dairy housemicrobiota present in the ripening room. *D. hansenii* is important during cheese ripening as it assimilates lactate and produces alkaline metabolites such as ammonia thereby increasing pH of the cheese surface [23, 46], which enables the growth of the less acid tolerant bacterial microbiota, primarily Gram-positive corvneforms (*Brevibacterium* spp., *Corvnebacterium* spp. and *Microbacterium* spp.) [4]. In addition, subpopulations of

Annotations Text selection

Id	Annotation Set	Ki	Type	Details
53	[imported] imported from annotation by bdridi in campaign 53		Exhibits	Agent (Taxon <i>Brevibacterium</i> spp.) + Property (Phenotype Gram-positive)
4d443...e	[imported] imported from annotation by bdridi in campaign 53		Exhibits	Agent (Taxon <i>Staphylococcus equorum</i>) + Property (Phenotype coagulase-negative)

Aggrégation de données publiées et disponibles dans les collections microbiennes

Source d'isolement

(Habitat)

Genbank, DSMZ, CIRM, littérature

Soy juice
Sausages
Cheese

Taxonomie

Genbank, littérature

Streptococcus thermophilus

Lactococcus lactis

Lactobacillus plantarum



Phenotypes

BacDive (DSMZ)

GOLD, littérature

Rod shape

Halophilic

Mesophilic



Perspectives d'innovations

Comprendre et améliorer les aliments fermentés

Trouver des souches adaptées

- *À la composition des nouvelles matières premières à fermenter*
- *Adapter les paramètres de fermentation (température, oxygène...)*
- *Diversifier les produits fermentés en exploitant de nouvelles espèces*
- *Maitriser les flores indésirables*
- *Combiner plusieurs fonctionnalités (arômes + probiotique)*
- *Produire de nouveaux levains*



What next ?

Amélioration en continue

- *Faire des liens avec les données génomiques pour mieux prédire*
- *Améliorer l'ontologie des aliments, des usages*
- *Améliorer le requêtage multiple*
- *Intégrer plus de collections de micro-organismes d'intérêt*

<http://migale.jouy.inra.fr/Florilege/>

Merci !

Collectif des microbiologistes alimentaires de l'INRAE
L'unité MAIAGE
Le métaprogramme MEM
L'unité STLO
Hélène Falentin