SUPPLEMENTARY DATA
Lekokotla, P., Miot-Sertier, C., Schneider, R., Divol, B., & Albertin, W. (2026). Uncovering the killer activity of Lachancea species against the wine spoilage yeast Brettanomyces bruxellensis. *OENO One*, 60(4).
https://oeno-one.eu/article/view/10137

SUPPLEMENTARY DATA

Table S1. A list of killer toxin-producing yeasts of biological significance for the potential control of *Brettanomyces* growth in wine.

Yeast	Toxin	Commercial name	Type of assay	Number of *Brettanomyces* strains/species investigated	Sensitive *Brettanomyces* strain/species	Compatibility with *S. cerevisiae*	Additional comment(s)	References
Suhomyces pyralidae formerly known as *Candida pyralidae* IWBT Y1140	Spkt1 formerly known as CpKT1	Level^{2} SALVA^{TM+} (Lallemand Inc., Montreal, QC, Canada)	Solid and liquid	15× *B. bruxellensis*, 4× *B. anomalus*, 2× *B. custersianus*,	7× *B. bruxellensis* and 2× *B. anomalus*	Compatible with both *S. cerevisiae* VIN 13^{+} (Anchor Oenology, Cape Town, South Africa) and *S. cerevisiae* Uvaferm 228™$^{+}$ (Lallemand Inc.)	Wine yeast	Mehlomakulu *et al*., 2014; Mehlomakulu *et al*., 2017; Lallemand Oenology, 2025
Torulaspora delbrueckii EX1180	Kbarr-1	N/A	solid	1× *Brettanomyces sp.*	None	Non-compatible with all *S. cerevisiae* tested	Wine yeast	Ramirez *et al*., 2015
Torulaspora delbrueckii NPCC 1033	TdKT	N/A	Solid	3× *B. bruxellensis*	At least one *B. bruxellensis* was sensitive (data not shown)	Compatible with all *S. cerevisiae*$^{+}$ investigated	Wine yeast	Villalba *et al*., 2016

Saccharomyces cerevisiae 54	Sc54kt	N/A	Solid and liquid	4× *B. bruxellensis*	2× *B. bruxellensis* strains	Not tested	Wine yeast	El Dana *et al*., 2025a
Lachancea thermotolerans 29 and *Lachancea thermotolerans* 54	Lt29Kt and Lt45Kt	N/A	Solid and liquid	4× *B. bruxellensis* strains	2× *B. bruxellensis* strains	- Lt45Kt not compatible with both *S. cerevisiae* S334 and *S. cerevisiae* Zymaflore® VL2^{+} (Laffort, Bordeaux, France) - Lt29Kt compatible with all investigated *S. cerevisiae* strains	Wine yeast	El Dana *et al*., 2025b
Metschnikowia pulcherrima Mp2^{+}	Mp2Kt	Undisclosed	Solid and liquid	4× *B. bruxellensis* strains	2×*B. bruxellensis* strains	Compatible with all *S. cerevisiae* strains tested were	Wine yeast	El Dana *et al*., 2025b
Kluyveromyces wickerhamii DBVPG 6077	Kwkt	N/A	Solid and liquid	*B. custersianus*, *B. naardenensis* and 13× *B. bruxellensis*	All investigated *Brettanomyces* isolates	Not applicable	Not isolated from wine environment	Comitini *et al*., 2004
Pichia membranificiens CYC 1086	PMKT2	N/A	Solid and liquid	16× *B. bruxellensis*	All investigated *B. bruxellensis*	Compatible with all *S. cerevisiae* strains tested	Isolated from Olive brine	Marquina *et al*., 1992; Santos *et al*., 2009

Ustilago maydis CYC 1410	KP6	N/A	Solid and liquid	17× *B. bruxellensis* strains	Inhibited all *B. bruxellensis* strains investigated	Compatible with all *S. cerevisiae* investigated	Corn plant pathogen (this killer strain was isolated from Spanish winery)	Santos *et al*., 2011
Pichia anomala DBVPG 3003	Pikt	N/A	Solid and liquid	*B. custersianus*, *B. naardenensis* and 13× *B. bruxellensis*	All investigated *Brettanomyces* isolates	Not applicable	A species regarded as a spoilage wine yeast and was not isolated from a wine environment	Comitini *et al*., 2004
Wickerhamomyces anomalus 18	WA18	N/A	Solid and liquid	74× *B. bruxellensis*	61× *B. bruxellensis*	Compatible with *S. cerevisiae* strains Lalvin™ QA23™⁺, Uvaferm BC™⁺, Lalvin™ BM45™⁺, Lalvin™ EC1118™⁺ (Lallemand Inc.)	Isolated from underground cheese ripening pit	Comitini *et al*., 2021
Wickerhamomyces anomalus Cf20	KTCf20	N/A	Solid and liquid	1× *B. bruxellensis*	1× *B. bruxellensis*	Not compatible with all investigated *S. cerevisiae* isolates	Wine yeasts. It inhibited the growth of other beneficial yeasts, i.e., *Torulaspora delbrueckii* and *Metschnikowia pulcherrima* isolates	Ullivarri *et al*., 2018

IWBT (Institute for Wine Biotechnology, now SAGWRI = South African Grape and Wine Research Institute, University of Stellenbosch, South Africa); NPCC (North Patagonian Culture Collection, Neuquén, Argentina); DBVPG (Department of Agricultural, Food, and Environmental Sciences, University of Perugia, Italy); CYC (Complutense Yeast Collection, University of Madrid, Spain). ⁺Commercial starter cultures. N/A = not applicable. Compatibility refers to whether the toxin inhibits or does not inhibit the growth of starter cultures investigated.

Table S2. Impact of lactic acid on the growth of wine associated yeasts.

***B. bruxellensis* strains**	**Lactic acid**					
	3 g/L	**6 g/L**	**9 g/L**	**12 g/L**	**15 g/L**	**18 g/L**
Diploid 2 (D2):	-	-	-	-	-	-
CRBO L14165	-	-	-	-	-	-
NCYC 2818	-	-	-	-	-	-
NCYC 3050	-	-	-	-	-	-
YJS 5334	-	-	-	-	-	-
YJS 5340	-	-	-	-	-	-
Diploid 1(D1):	-	-	-	-	-	-
CBS 2499	-	-	-	-	-	-
DEN 612_9	-	-	-	-	-	-
CRBO L0611	-	-	-	-	-	-
CRBO L14163	-	-	-	-	-	-
CRBO L14168	-	-	-	-	-	-
Allotriploid 3 (A3):	-	-	-	-	-	-
CBS 5512	-	-	-	-	-	-
CBS 5513	-	-	-	-	-	-
CRBO L14169	-	-	-	-	-	-
SJ12-4	-	-	-	-	-	-
UWOPS 92-255.4	-	-	-	-	-	-
Allotriploid 2 (A2):	-	-	-	-	-	-
CRBO L14190	-	-	-	-	-	-
CRBO L0424	-	-	-	-	-	-
CRBO L0516	-	-	-	-	-	-
12-LT-VGC3-c-10	-	-	-	-	-	-
13-LT-VGC55-d-1	-	-	-	-	-	-
Allotriploid 1 (A1):	-	-	-	-	-	-
CRBO L0422	-	-	-	-	-	-
CRBO L14173	-	-	-	-	-	-
CRBO L14183	-	-	-	-	-	-
CRBO L1794	-	-	-	-	-	-
ISA 1700	-	-	-	-	-	-
Autotriploid (Admixed D1/D2):	-	-	-	-	-	-
CRBO L0308	-	-	-	-	-	-
Gamay 329 CM 5	-	-	-	-	-	-

GB59	-	-	-	-	-	-
ISA 2211	-	-	-	-	-	-
Other wine yeasts						
Zygosaccharomyces rouxii CRBO L0314	-	-	-	-	-	-
Brettanomyces anomalus NRRL Y-12670	-	-	-	-	-	-
Dekkera anomala NRRL Y-17522T	-	-	-	-	-	-
Zygosaccharomyces bailii CLIB 213	-	-	-	-	-	-
Zygosaccharomyces bailii CRBO L0446	-	-	-	-	-	-
Schizosaccharomyces pombe NRRL Y-12796	-	-	-	-	-	-
Schizosaccharomyces pombe CRBO L0442	-	-	-	-	-	-
Hanseniaspora uvarum CRBO L1433	-	-	-	-	-	-
Torulaspora delbrueckii CLIB 230	-	-	-	-	-	-
Torulaspora delbrueckii CRBO L0705	-	-	-	-	-	-
Metschnikowia pulcherrima NRRL Y-7111	-	-	-	-	-	-
Metschnikowia pulcherrima CRBO L0675	-	-	-	-	-	-
Candida zemplinina CBS 9484	-	-	-	-	-	-
Candida zemplinina CRBO L0473						
Commercial starter cultures[+]						
Saccharomyces cerevisiae Fermivin® MT 48	-	-	-	-	-	-
Saccharomyces cerevisiae Fermivin® MT XL	-	-	-	-	-	-
Saccharomyces cerevisiae Fermivin® P21	-	-	-	-	-	-
Saccharomyces cerevisiae Anchor WE 372	-	-	-	-	-	-
Saccharomyces cerevisiae Anchor NT50	-	-	-	-	-	-

Hanseniaspora vineae Fermivin® VINEAE	-	-	-	-	-	-
Saccharomyces cerevisiae Fermivin® PF6	-	-	-	-	-	-
Saccharomyces bayanus Fermivin® 4f9	-	-	-	-	-	-
Saccharomyces cerevisisae × *Saccharomyces paradoxus* hybrid Exotics Mosaic	-	-	-	-	-	-

*CLIB (Collection de Levures d'Intérêt Biotechnologique, now CIRM-Levures = Centre International de Ressources Microbiennes, Levures, Montpellier, France, Paris, France); ISA (Instituto Superior de Agronomia, University of Lisbon, Portugal); NCYC (National Collection of Yeast Cultures, Norwich, United Kingdom); CBS (Centraalbureau voor Schimmel cultures, Utrecht, Netherlands); UWOPS (Culture collection of the University of Western Ontario, Ontario, Canada);NRRL (Northern Regional Research Laboratory, ARS Culture collection, Peoria, IL, USA); YJS (Laboratory for Molecular Genetics, Genomics and Microbiology, Strasbourg University, France); CRBO (Centre de Ressources Biologiques Œnologiques, Bordeaux, France);. *Strains without collection ID belong to UMR Oenology (Bordeaux, France). +Commercial starter cultures are from Oenobrands SAS (Montpellier, France). (-) No growth inhibition.*

SUPPLEMENTARY DATA
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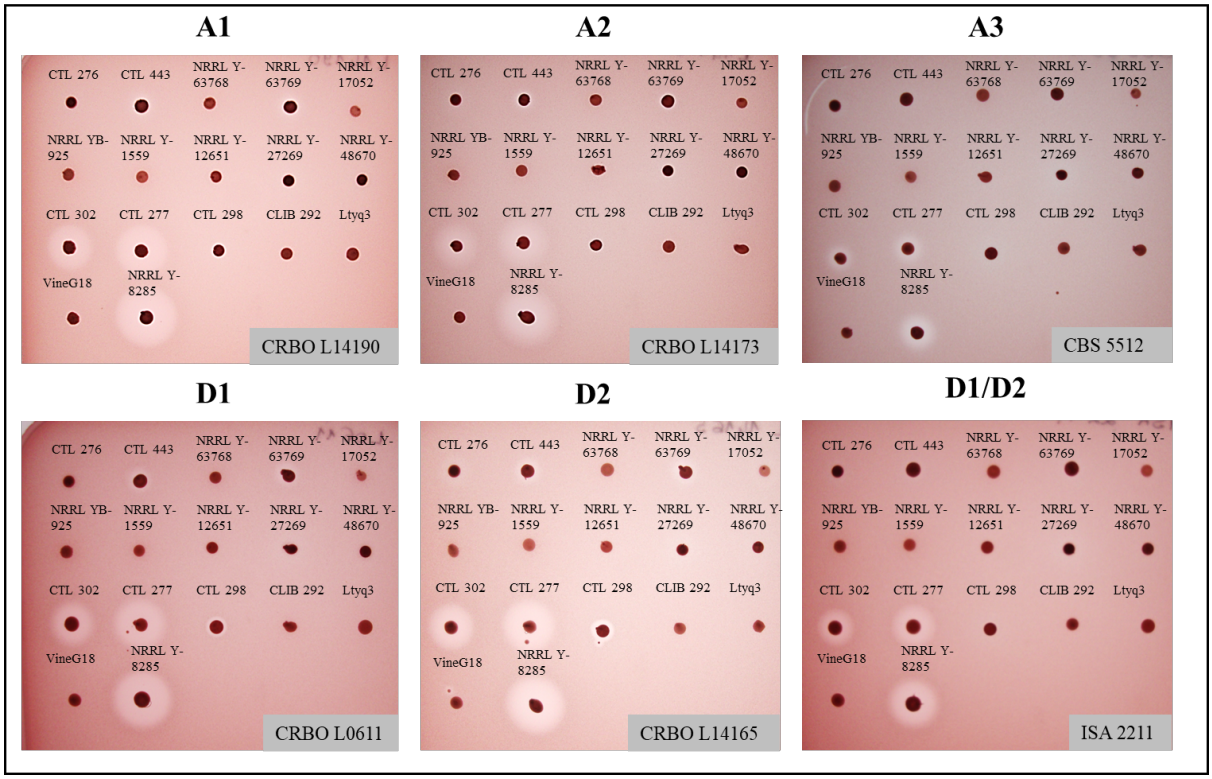


Figure S1. A representation of zones of inhibition observed after conducting the killer assay, where *B. bruxellensis* strains were used as target strains. The strains represent each *B. bruxellensis* genetic group investigated. (A1): Allotriploid 1; (A2): Allotriploid 2; (A3): Allotriploid 3; (D1): Diploid 1; (D1): Diploid 2; (D1/D2): Autotriploid. The spots represent all the *Lachancea* isolates investigated in this study.