Genomics Perspectives on Metabolism, Survival Strategies, and Biotechnological Applications of Brettanomyces bruxellensis LAMAP2480

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Wine production is an important commercial issue for the liquor industry. The global production was estimated at 275.7 million hectoliters in 2015. The loss of wine production due to Brettanomyces bruxellensis contamination is currently a problem. This yeast causes a "horse sweat" flavor in wine, which is an undesired organoleptic attribute. To date, 6 B. bruxellensis annotated genome sequences are available (LAMAP2480, AWRI1499, AWRI1608, AWRI1613, ST05.12/22, and CBS2499), and whole genome comparisons between strains are limited. In this article, we reassembled and reannotated the genome of B. bruxellensis LAMAP2480, obtaining a 27-Mb assembly with 5.5 kb of N50. In addition, the genome of B. bruxellensis LAMAP2480 was analyzed in the context of spoilage yeast and potential as a biotechnological tool. In addition, we carried out an exploratory transcriptomic analysis of this strain grown in synthetic wine. Several genes related to stress tolerance, micronutrient acquisition, ethanol production, and lignocellulose assimilation were found. In conclusion, the analysis of the genome of B. bruxellensis LAMAP2480 reaffirms the biotechnological potential of this strain. This research represents an interesting platform for the study of the spoilage yeast B. bruxellensis.

Biotechnological potential

Brettanomyces bruxellensis strain

Re-assembly

glucose isomerase

heat shock protein

hexokinase

lignocellulose

proteome

trace element

transcription factor

transcriptome

transfer RNA

lignin

lignocellulose

alcohol production

Article

biotechnology

Brettanomyces

Brettanomyces bruxellensis

carbon metabolism

controlled study

fungal contamination

fungal metabolism

genetic conservation

genome analysis

genomics

nonhuman

stress

survival rate

transcriptomics

wine

wine industry

bacterial gene

biotechnology

Brettanomyces

chromosomal mapping

food control

fungal gene

fungal genome

genetics

metabolism

microbiology

proteomics

whole genome sequencing

Biotechnology

Brettanomyces

Chromosome Mapping

Food Microbiology

Genes, Bacterial

Genes, Fungal

Genome, Fungal

Lignin

Proteomics

Whole Genome Sequencing

Wine