

# Strain-specific responses of *Saccharomyces cerevisiae* to competition by non-*Saccharomyces* yeasts

AWRI

Cristobal Onetto<sup>1</sup>, Anthony Borneman<sup>1</sup>, Simon Schmidt<sup>1</sup>

<sup>1</sup> The Australian Wine Research Institute, PO Box 197, Glen Osmond (Adelaide) SA 5064, Australia

Corresponding author's email: cristobal.onetto@awri.com.au

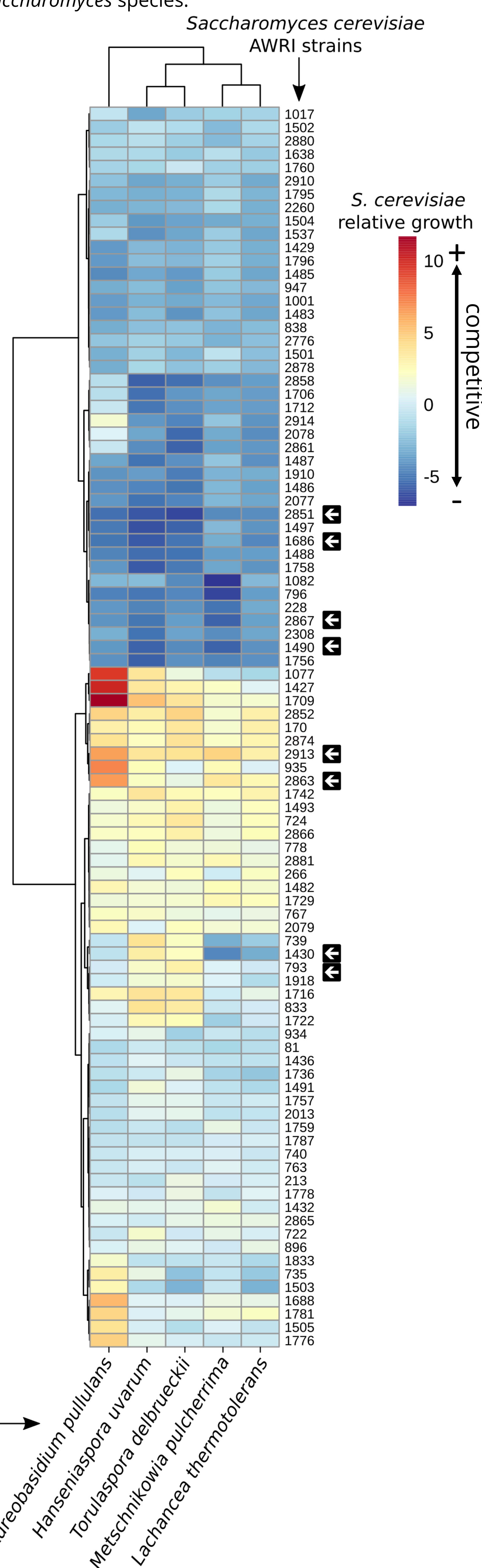
## BACKGROUND

Using a non-*Saccharomyces* yeast species in winemaking also involves sequential or co-inoculation of a *Saccharomyces cerevisiae* strain to complete the fermentation.

However, antagonism or competition between non-*Saccharomyces* species and *S. cerevisiae* can affect subsequent fermentation performance.

Characterisation of strain-specific responses to sequential or co-inoculation would enable the identification of specific combinations of *S. cerevisiae* and non-*Saccharomyces* strains that minimise the negative impacts on fermentation.

(A) Competitive screen of 93 *S. cerevisiae* strains with 5 non-*Saccharomyces* species.

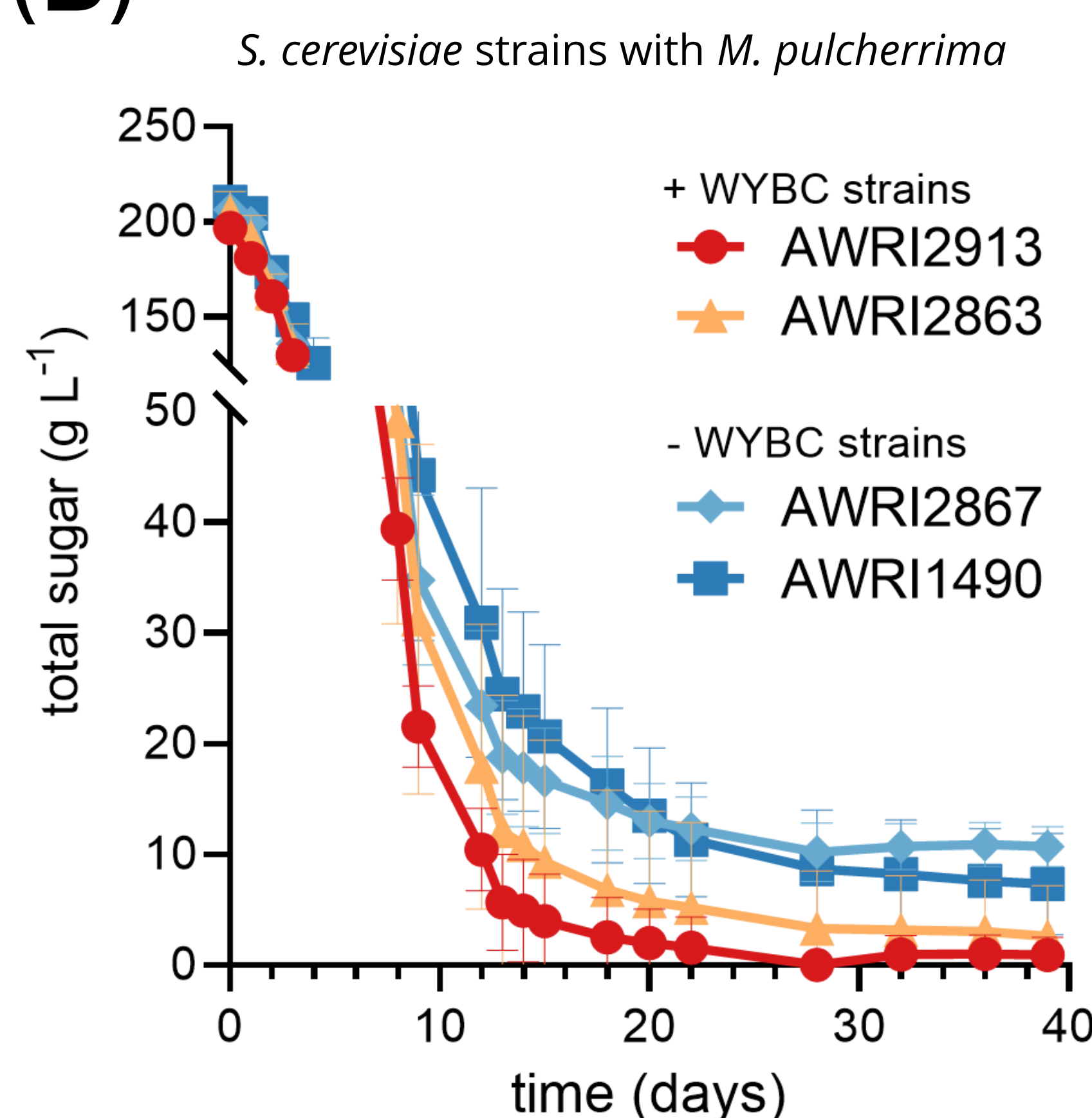


## METHODS

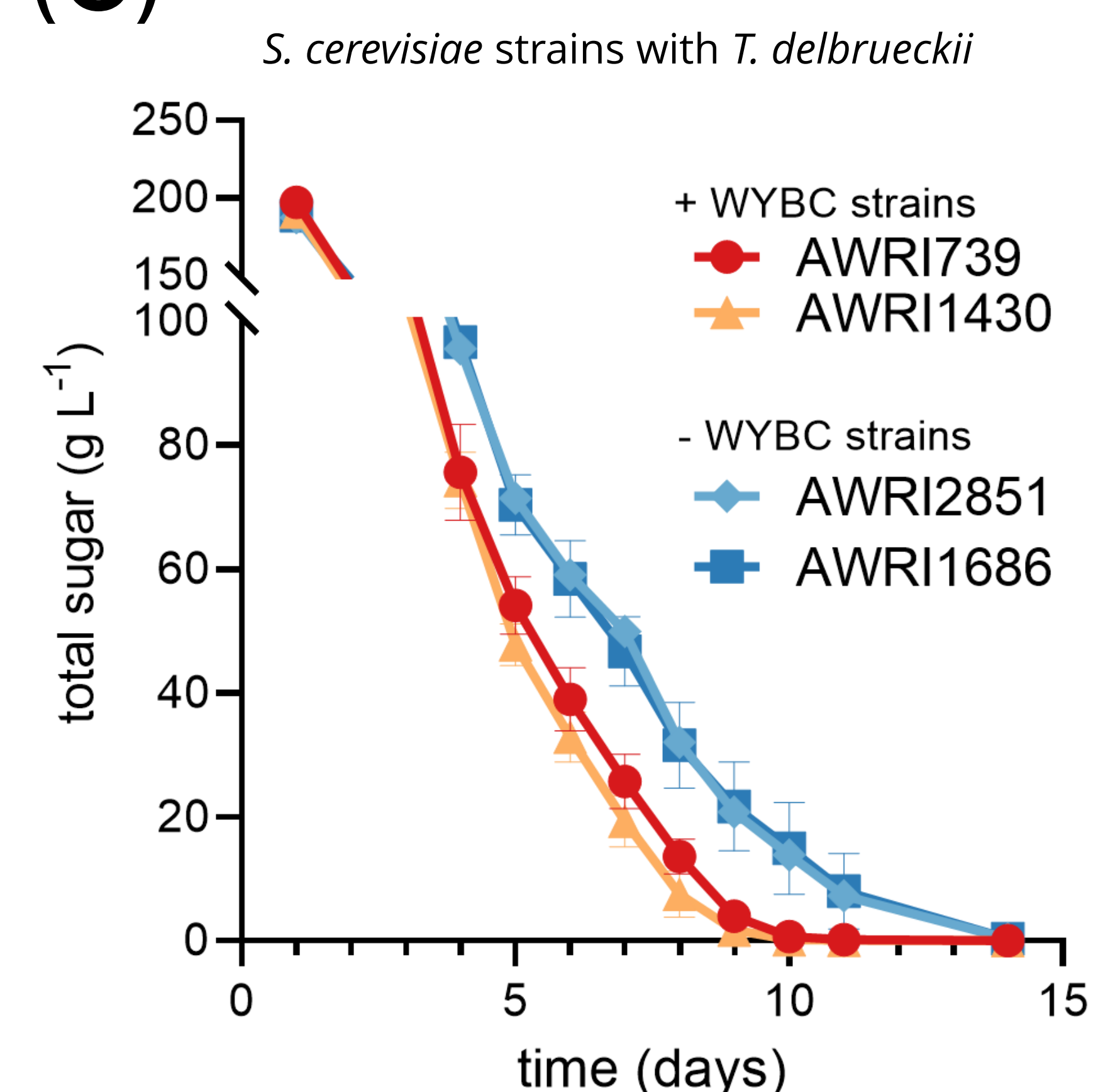
(A) The competitive fitness scores of 93 *S. cerevisiae* strains in response to different non-*Saccharomyces* species were simultaneously estimated using a mixed inoculum strategy with barcoded yeast (WYBC).

(B and C) Specific *S. cerevisiae* strain/non-*Saccharomyces* combinations were evaluated in single inoculum fermentations.

(B)



(C)



## RESULTS

(A) All the non-*Saccharomyces* species tested had strain-specific fitness effects on *S. cerevisiae*.

(B) *Metschnikowia pulcherrima* caused stuck fermentations when combined with specific *S. cerevisiae* strains.

(C) *Torulaspora delbrueckii* caused *S. cerevisiae* strain-specific increases in fermentation time.

In both cases *S. cerevisiae* strains were also identified that were less affected by the non-*Saccharomyces* yeasts.

## TAKE HOME MESSAGE

When making wine using non-*Saccharomyces* yeast, the choice of *Saccharomyces cerevisiae* strain to complete the ferment will influence overall fermentation performance. Appropriate strain/yeast combinations are required to optimise fermentation.

Publication QR code:

