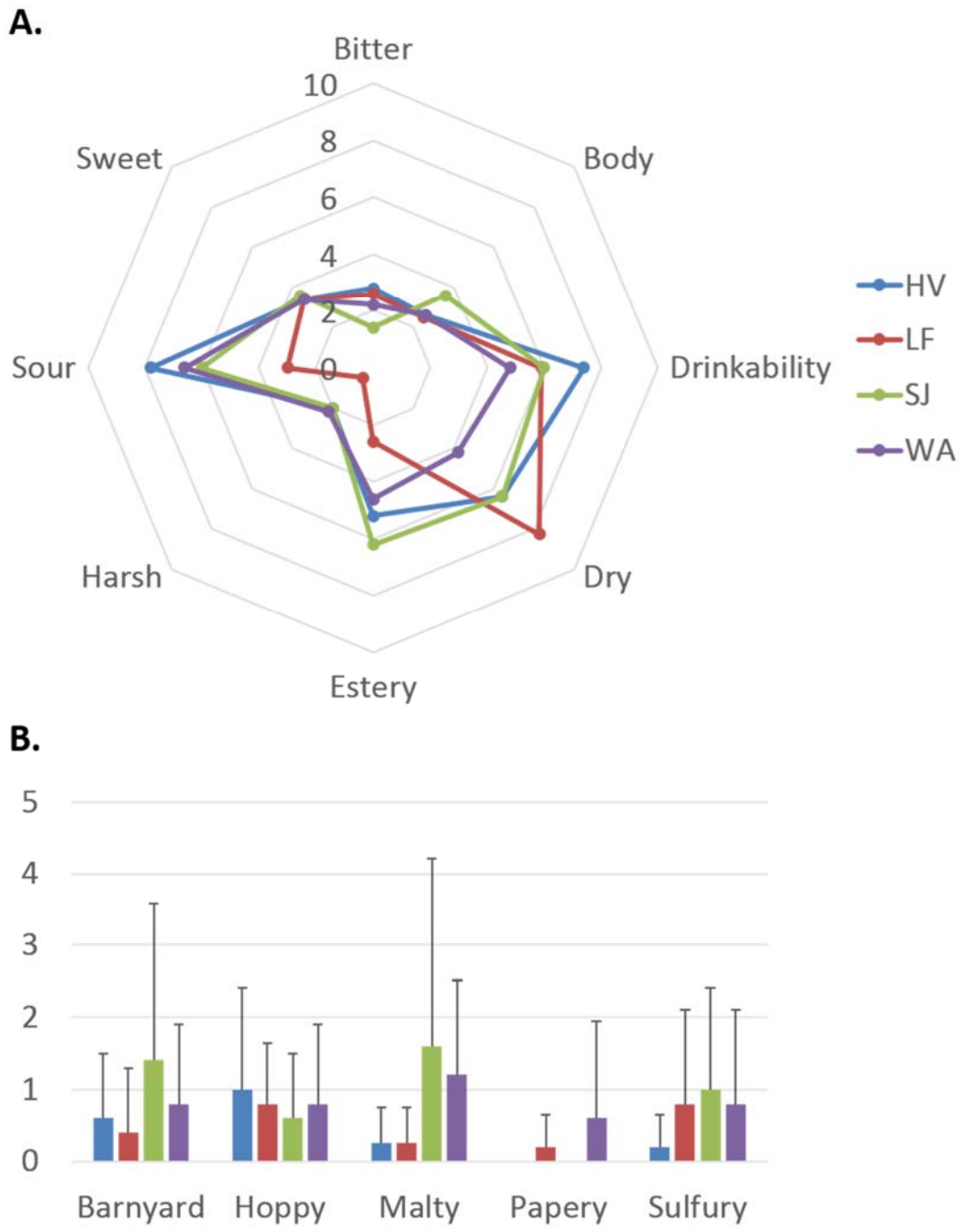
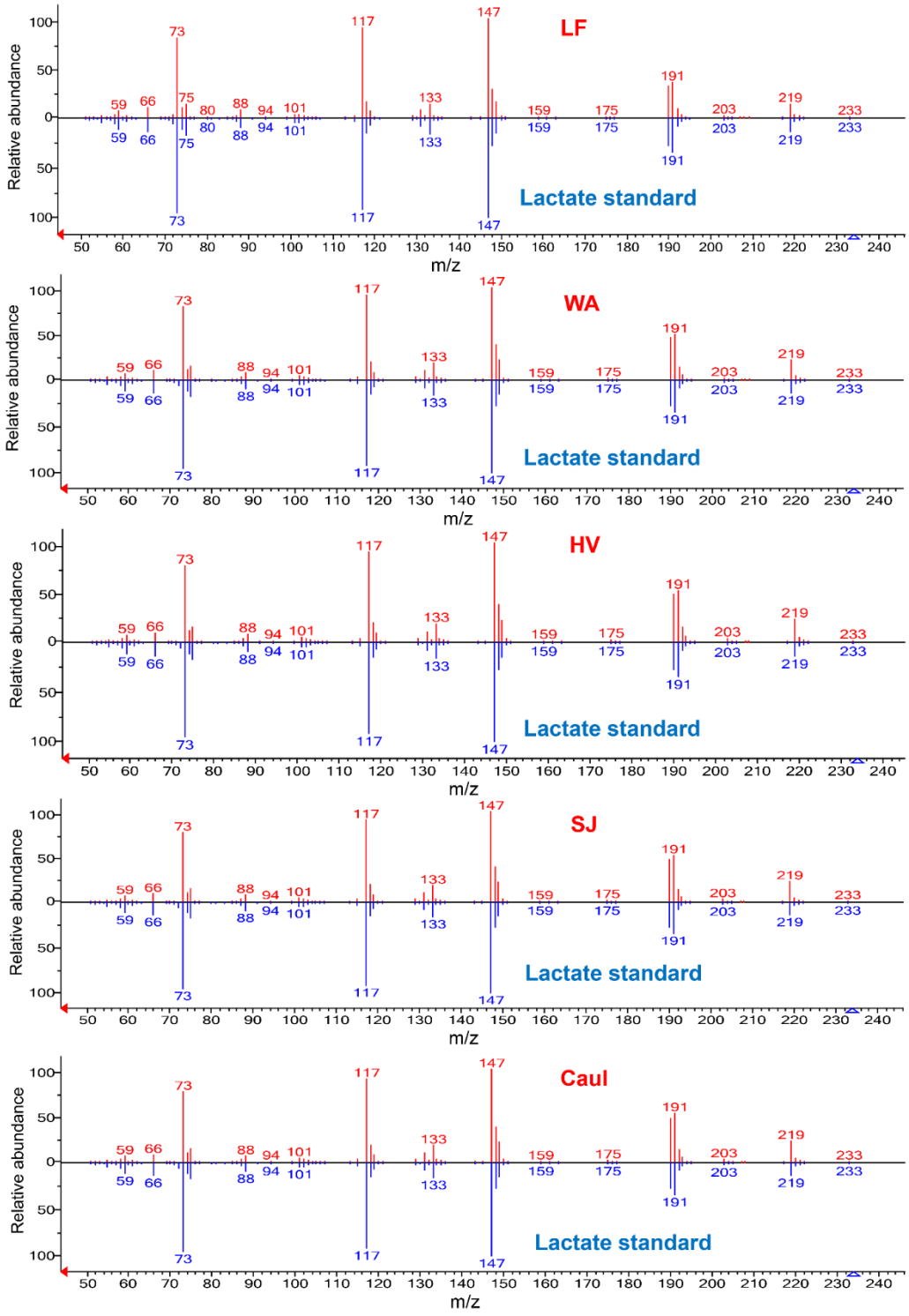
## Supplemental Materials

### Supplemental figures

**Supplemental Figure 1. Appearance of *Schizosaccharomyces japonicus* during wort fermentation.** The *S. japonicus* cells formed large, popcorn-shaped flocs during fermentation. Left) *S. japonicus* popcorn during early vigorous fermentation; Right) *S. japonicus* popcorn that settled to the bottom of the fermenter during a later stage of fermentation.




**Supplemental Figure 2. Sensory analysis of beers in Table 3. A)** A panel of five people assessed the sour beers described in Table 3 for the flavor descriptors shown in the spider graph as described in [1]. The average values are plotted, and outliers were removed using Grubbs' test with GraphPad Prism. HV = *Hanseniaspora vineae*, LF = *Lachancea fermentati*, SJ = *Schizsaccharomyces japonicus*, and WA = *Wickerhamomyces anomalus*. **B)** The flavor descriptors on the x-axis were also assessed as in **A)**, but their averages values were so low that they were omitted from the spider plot. The bars represent the averages, and the error bars are the standard deviations.




**Supplemental Figure 3. Aligned MS spectra of the lactate standard and the isolated lactate from the indicated beers analyzed by GC-MS.** LF = *Lachancea fermentati*, WA = *Wickerhamomyces anomalus*, HV = *Hanseniaspora vineae*, SJ = *Schizsaccharomyces japonicus*, and Caul = Cauldron, a sour beer made by the Upland Brewing Company via mixed fermentation of yeasts with lactic acid bacteria [2].

## Supplemental references

[1] M.J. Wu, F.M. Clarke, P.J. Rogers, P. Young, N. Sales, P.J. O'Doherty, V.J. Higgins, Identification of a protein with antioxidant activity that is important for the protection against beer ageing, Int J Mol Sci, 12 (2011) 6089-6103.
[2] C.M. Rogers, D. Veatch, A. Covey, C. Staton, M.L. Bochman, Terminal acidic shock inhibits sour beer bottle conditioning by Saccharomyces cerevisiae, Food Microbiol, 57 (2016) 151-158.