In-process quality control of wine by (micro) planar chromatography

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Highlights

- Monitoring and quantification of up to 19 analyses in parallel within 1-2.5 h
- Minimal sample preparation (only dilution)
- Simple, step-automated in-process control
- Potential of a low-cost µ-PLC system (€ 4000 investment costs)

Amino acids

Profiling and quantification of amino acids in wine
HPTLC/µ-PLC distinguishes also wine varieties.

Fig. 1 (A) HPTLC chromatogram with 4 wine samples (P17-P20) and standards (S1-S4 80-950 ng/µL), (B) µ-PLC chromatogram using the same mobile phase and (C) HPTLC chromatogram with eluted zones of a wine sample and mass spectra.

Sugars

Control of alcoholic fermentation and detection of sugar enrichment
HPTLC/µ-PLC shows no added sucrose.

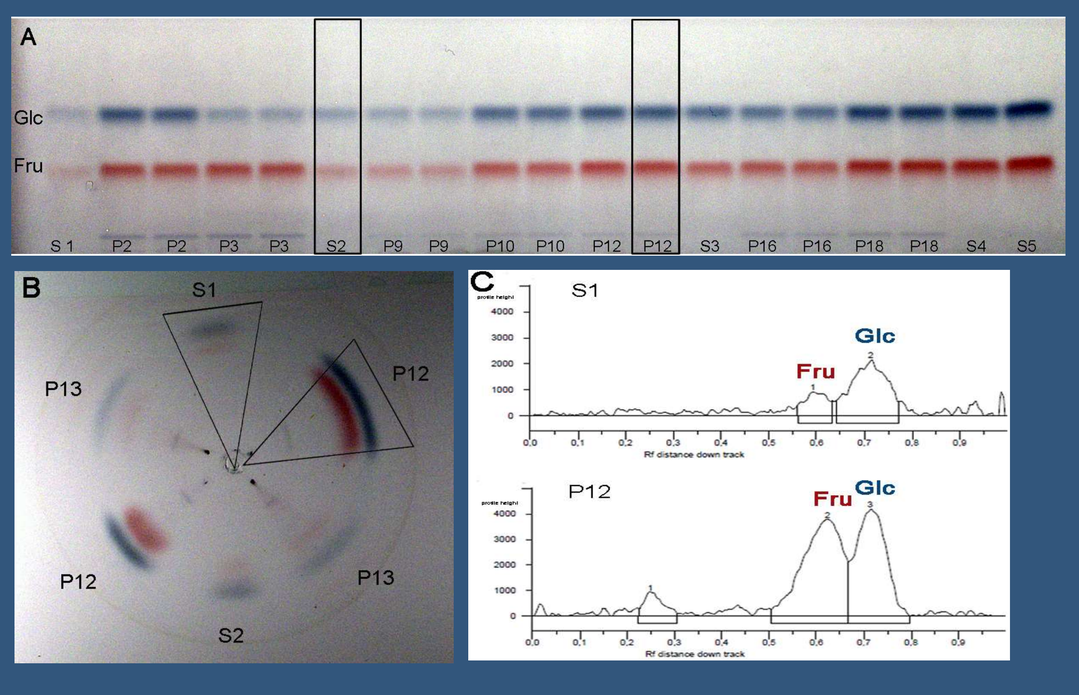
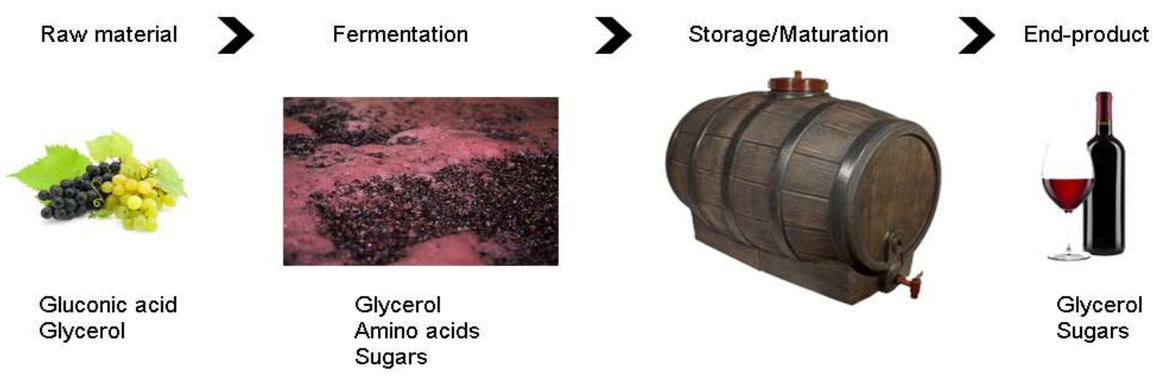


Fig. 2 (A) HPTLC chromatogram with 8 wine samples (P2-P18) and standards (S1-S5, 20-250 ng/µL), (B) µ-PLC chromatogram using the same mobile phase and (C) corresponding densitogram of marked tracks using imaging software.



Glycerol

Monitoring of grapes' health status, fermentation control of grape must (spontaneous or regular) and detection of glycerol adulteration

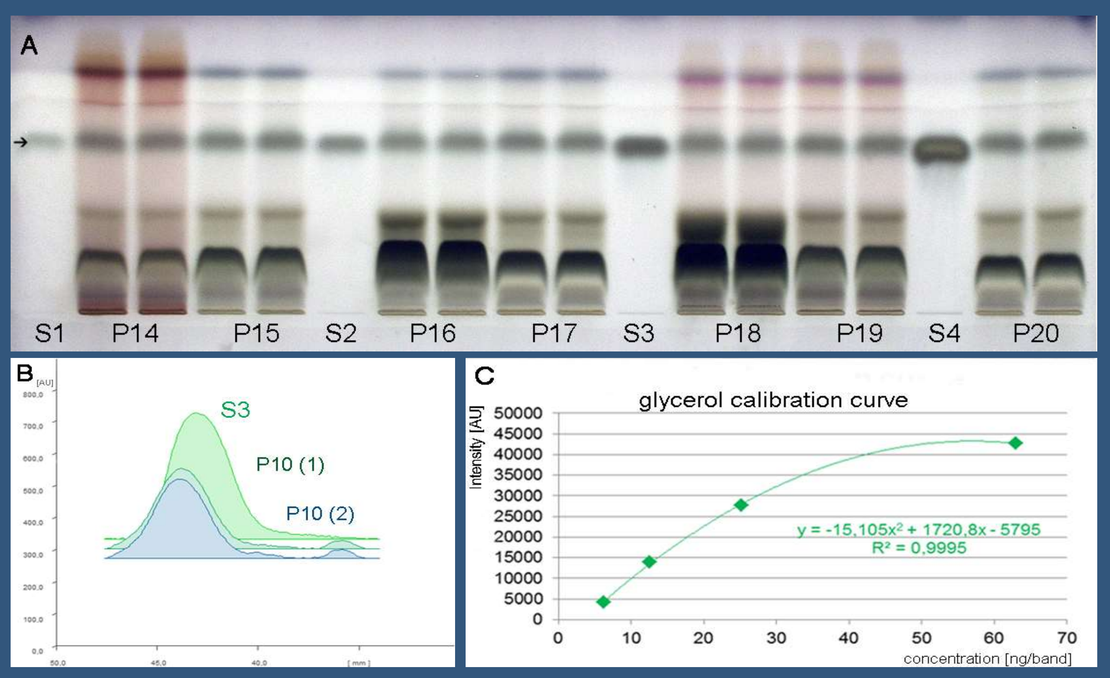


Fig. 4 (A) HPTLC chromatogram with 6 wine samples (P14-19) and standards (S1-S4 6-63 µg/µL), (B) densitogram of absorption measurement and (C) corresponding calibration curve.

Gluconic acid

Threshold method for *Botrytis cinerea* infection
HPTLC also detects malic-, tartaric- and citric acid.

Fig. 3 HPTLC chromatogram with 15 wine samples (P1-P15) and the applied threshold of gluconic acid (S, 1 g/L [2]). Selective detection of gluconic acid as red band. Blue bands are assigned to sugars.

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References [1] S. Kirchert, R.E. Kaiser, G.E. Morlock, in submission. [2] International Organisation of Vine and Wine, Compendium of international methods of wine and must analysis. Annex D, Edition 2012, Vol. 2.

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