SUPPLEMENTAL MATERIAL FOR:

Characterization of the key odorants in goji wines in three levels of sweetness by applications of sensomics approach

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Determination of Ethanol in GWs

Ethanol was analyzed by a Clarus 400 gas chromatograph (PerkinElmer, UK) in connection with a TurboMatrix 40 Trap Headspace-Sampler (Perkin Eimer, UK). The sample (10 mL) was equilibrated in a 22 mL headspace vial with PTFE septa and clamp closure for 15 min at 60 ˚C. With an injection time of 0.1 min, the sample was applied by splitless with a split/splitless-injector at 15 mL/min, and the temperature was kept at 100 ˚C using nitrogen as the carrier gas with a flow pressure of 65 kPa. The sample was flushed onto the Rtx-502.2 fused silica capillary column (50 m × 0.32 mm inner diameter, 0.18 µm film thickness). The oven temperature programs were as follows: 40 ˚C for 1 min and 10 ˚C/min up to 150 ˚C. At the end of the column, the effluent was analyzed by FID, which was held at 250 ˚C. The detector gas was 45 mL/min hydrogen and 450 mL/min air. A calibration factor was determined by analyzing mixtures of defined amounts of *tert*-butanol and ethanol in ratios of 1:3, 1:2, 1:1, 2:1, 3:1 (**Table S1**).

Determination of Sugar Contents in GWs

Based on the method of Morlock and Sabir,[1] the sugar content was analysed via high-performance thin-layer chromatography (HPTLC). An Automatic TLC sampler 4 (ATS 4, CAMAG, Muttenz, Switzerland) was used to apply samples and standards. For analysis, aliquots of 2-14 µL of samples (diluted to ~60 µg/L sugar content with 1:1 methanol/water, *v/v*) and 1-20 µL of standards (two standard solutions; solution 1: sucrose; solution 2: fructose and glucose, each analyte with ~60 µg/L in 1:1 methanol/water, *v/v*) were applied bandwise on a 20 cm × 10 cm silica gel 60 F_{254} plate (Merck, Darmstadt, Germany) with a distance from the lower edge of 8 mm and right edge of 10 mm. Methanol was used as the rinsing solvent. Plate images were captured with the TLC Visualizer (CAMAG) under UV 254 nm, UV 366 nm, and white light illumination. The plate was placed in an Automatic Development Chamber (ADC2, CAMAG) equipped with a 20 cm × 10 cm twin-trough chamber (CAMAG). A mixture of *n*-butanol/isopropanol/acetic acid/boric acid solution (200 mg boric acid dissolved in 10 mL of

water) (6:14:1:3, *v/v/v/v*) was used for the chamber saturation that was conducted for 15 min (using a filter paper in the ADC 2) and for the development up to a migration distance of 60 mm. After a drying step for 10 min, plate images were captured a second time. For derivatization, the plate was dipped into an aniline-diphenylamine-*o*-phosphoric acid reagent (mixture of 2 g aniline and 2 g diphenylamine in 200 mL of methanol with an additional 20 mL of *o*-phosphoric acid (85%, *w/w*)), with a TLC Chromatogram Immersion Device III (CAMAG, immersion speed 3.5, immersion time 0). Then, the plate was dried under cold air steam until dryness and heated for 5-10 min at 110 ˚C. Plate images were captured under UV 254 nm, UV 366 nm, and white illumination. Afterward, a TLC Scanner 4 (CAMAG) was used to scan the plate in absorption mode at UV 380 nm. Quantification was done via a five-point calibration (60-1200 ng/zone), and the standard addition technique was used to verify the results. Control of HPTLC instruments and data analysis were down with winCATS software, version 1.4.6.2002 (CAMAG).

Table S1. Ethanol Calibration Curve and Concentrations in Three Goji Wines

sample	calibration curve	R^2	concentration (μg/L)				
			exp.1[a]	exp.2	exp.3	average	RSD[b]
SGW			84727	101384	77017	87710	14%
SDGW	y = 0.2351x + 0.0451	0.9977	79463	83841	99518	87606	12%
DGW			109020	93961	93177	98719	9%

[a]exp., experiment. [b]RSD, relative standard deviation.

Table S2. Sugar Compositions and Concentrations in GWs

	concentration (g/L)		
	SGW	SDGW	DGW
glucose	12	4.4	0.20
fructose	21	8.4	0.40
total sugar concentration	33	13	0.60

Table S3. Odor Thresholds (OTs) of Odorants

odorant	OT (µg/L)	odorant	OT (µg/L)
(*E*)-*β*-damascenone	0.05[a]	2-methoxyphenol	10[a]
cis-whisky lactone	0.01[a]	phenylacetic acid	2 500[c]
trans-whisky lactone	0.01[a]	2-methoxy-4-vinylphenol	40[a]
3-methyl-2,4-nonanedione	0.046[h]	eugenol	5[a]
ethanol	990 000[h]	acetic acid	200 000[a]
ethyl 2-methylbutanoate	1[a]	vanillin	200[a]
ethyl octanoate	2[a]	ethyl propanoate	5 500[d]
decanal	1[f]	*p*-cresol	60[e]
ethyl 3-methylbutanoate	3[a]	*m*-cresol	68[b]
ethyl hexanoate	5[a]	2, and 3-methylbutanoic acid	3 000[a]
(*E*)-2-nonenal	0.6[d]	2-methylpropyl acetate	1 605[c]
3-methyl-1-butanol	30 000[a]	*α*-terpineol	250[b]
octanal	3.4[h]	acetophenone	500[a]
2, and 3-methylbutyl acetate	30[a]	4-hydroxy-2,5-dimethyl-3(2*H*)-furanone	500[a]
ethyl 3-phenylpropanoate	1.6[b]	methionol	500[a]
6-methyl-5-hepten-2-one	0.16[g]	hexanoic acid	3 000[a]
ethyl butanoate	20[a]	ethyl 2-phenylacetate	650[f]
nonanal	1[f]	2-phenylethyl acetate	250[a]
3-hydroxy-4,5-dimethyl-2(5*H*)-furanone	5[a]	(*Z*)-3-hexen-1-ol	400[a]
phenylacetaldehyde	1[d]	decanoic acid	15 000[a]
nonanoic acid	26[h]	heptanoic acid	13 300[e]
γ-nonalactone	7[f]	butanoic acid	10 000[a]
ethyl cinnamate	1[a]	linalool	15[a]
2-phenylethanol	10 000[a]	3-phenylpropanoic acid	120[h]
octanoic acid	500[b]	pentanoic acid	11 000[h]
ethyl 2-methylpropanoate	15[a]		

[a]Orthonasal odor threshold in 10% ethanol/water solution as reported in ref.[2] [b]Orthonasal odor threshold in 11% ethanol/water solution containing 7 g/L glycerol, 5 g/L tartaric acid, pH 3.2 with 1 M sodium hydroxide in ref.[3] [c]Orthonasal odor threshold in 10% ethanol/water solution at pH 3.2 in ref.[4] [d]Orthonasal odor threshold in 10% ethanol/water solution containing 5 g/L tartaric acid at pH 3.2 in ref.[5] [e]Orthonasal odor threshold in 46% ethanol/water solution in ref.[6] [f]Orthonasal odor threshold in 11% ethanol/water solution in ref.[7] [g]Orthonasal odor threshold in water in ref.[8] [h]Orthonasal odor threshold in water obtained from the Leibniz-LSB@TUM Odorant Database (https://www.leibniz-lsb.de/en/databases)

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