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Food-grade argan oil supplementation in molasses enhances fermentative performance and antioxidant defenses of active dry wine yeast.

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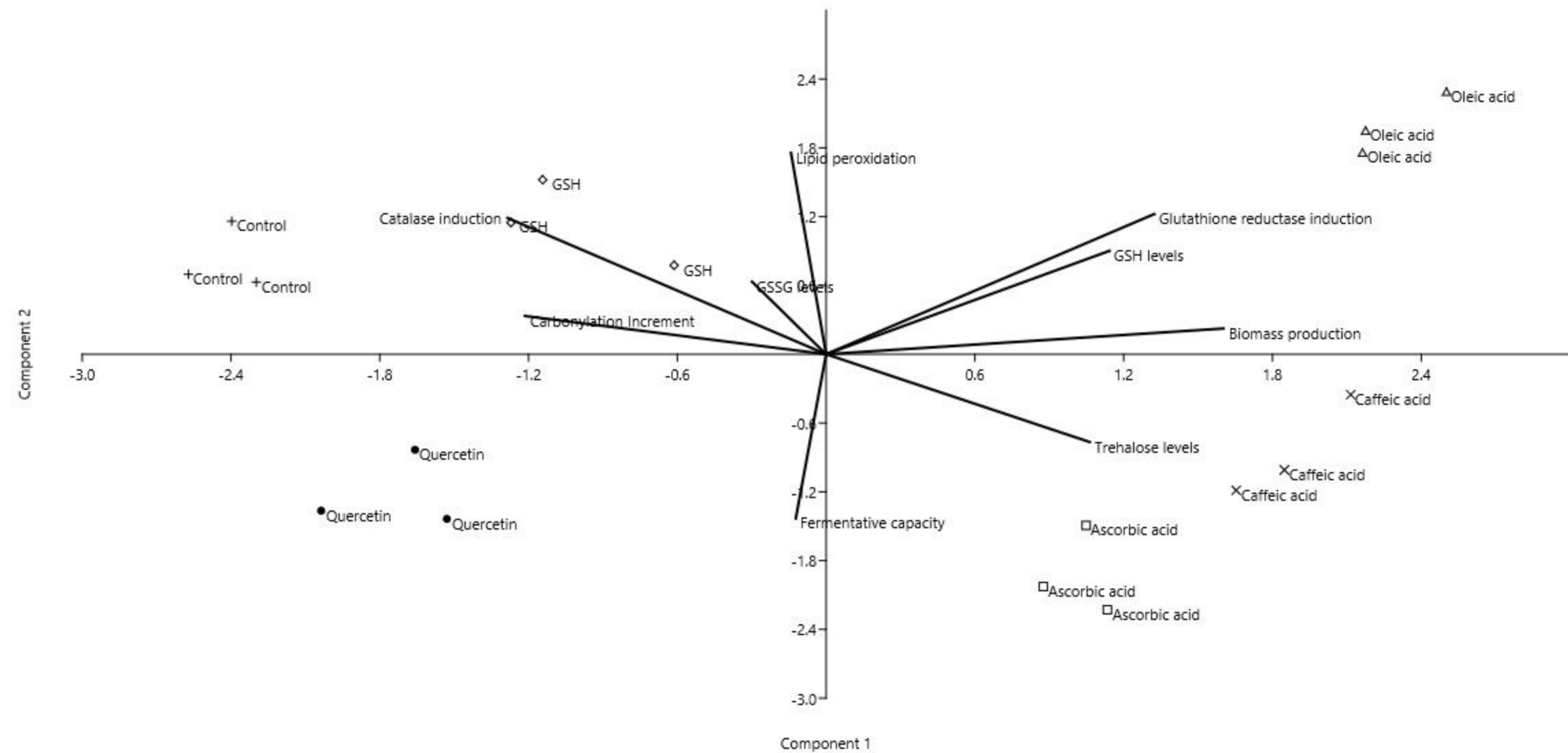
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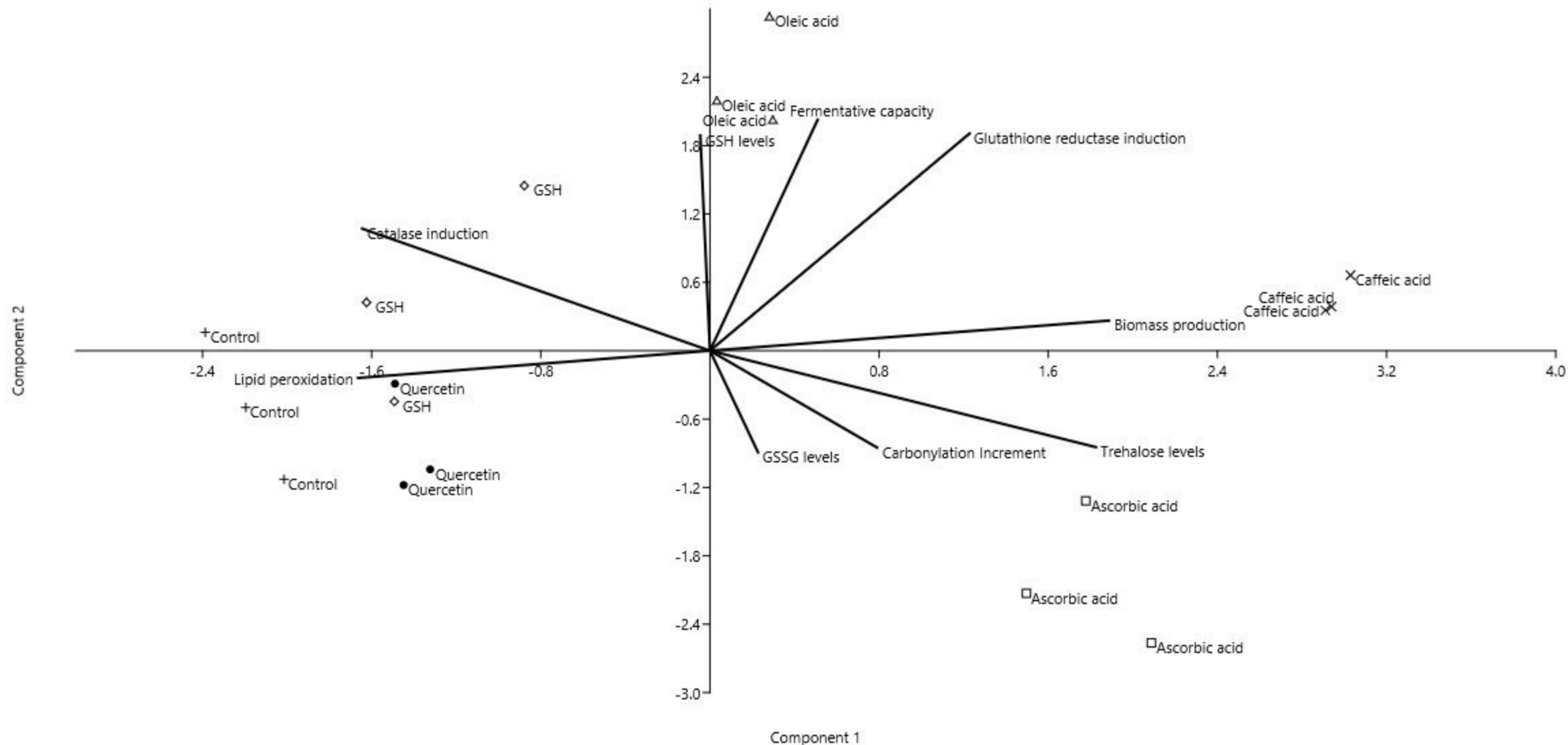
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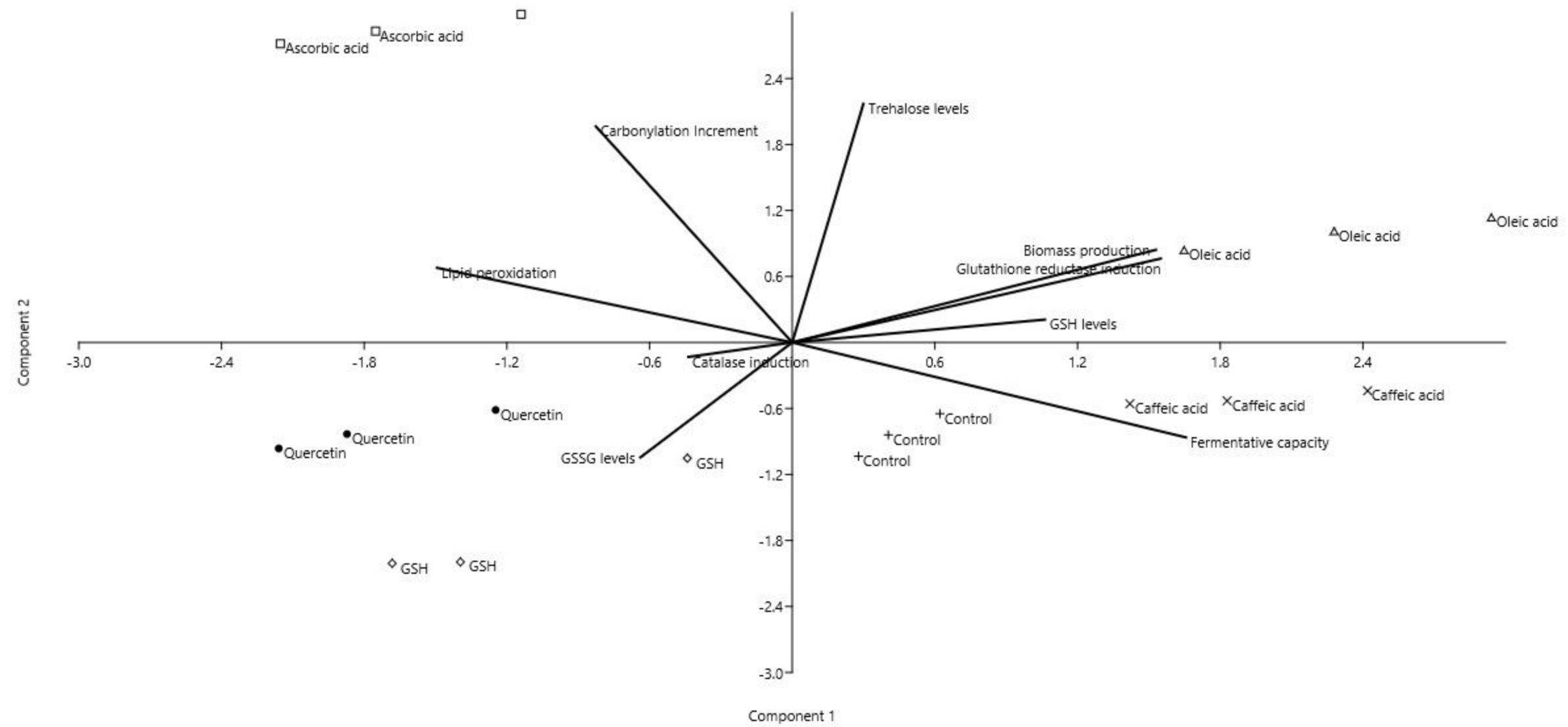
A) T73



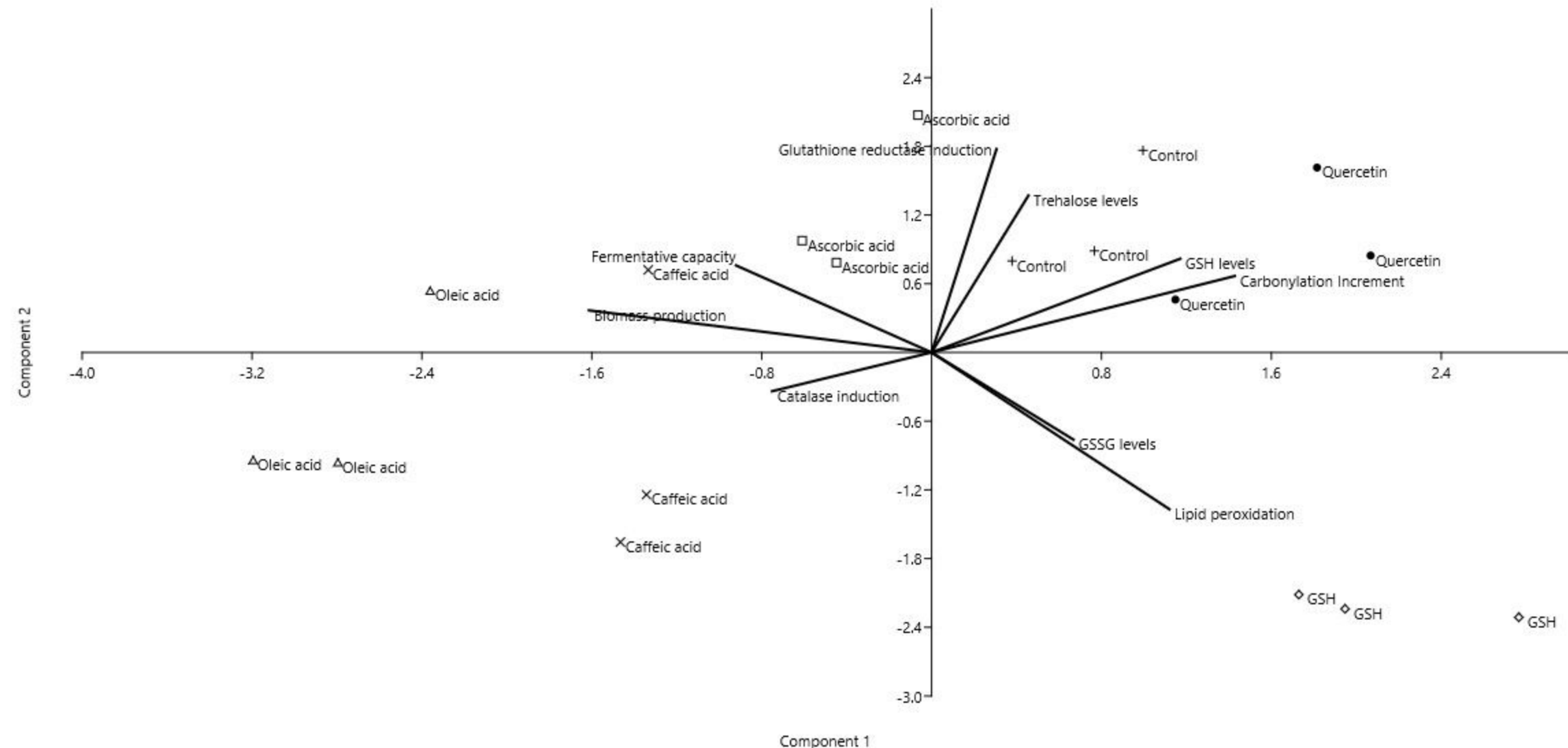
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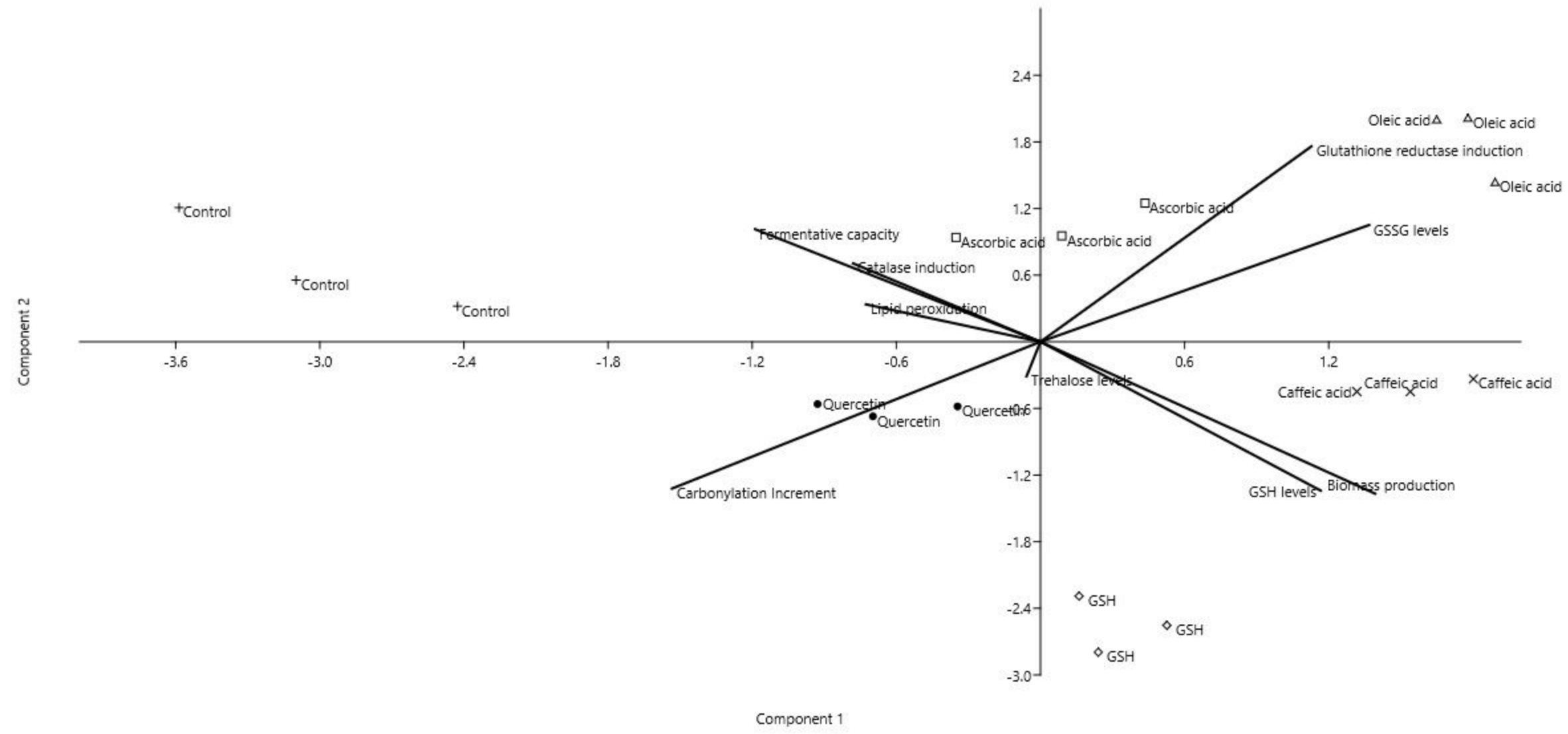
C) D170



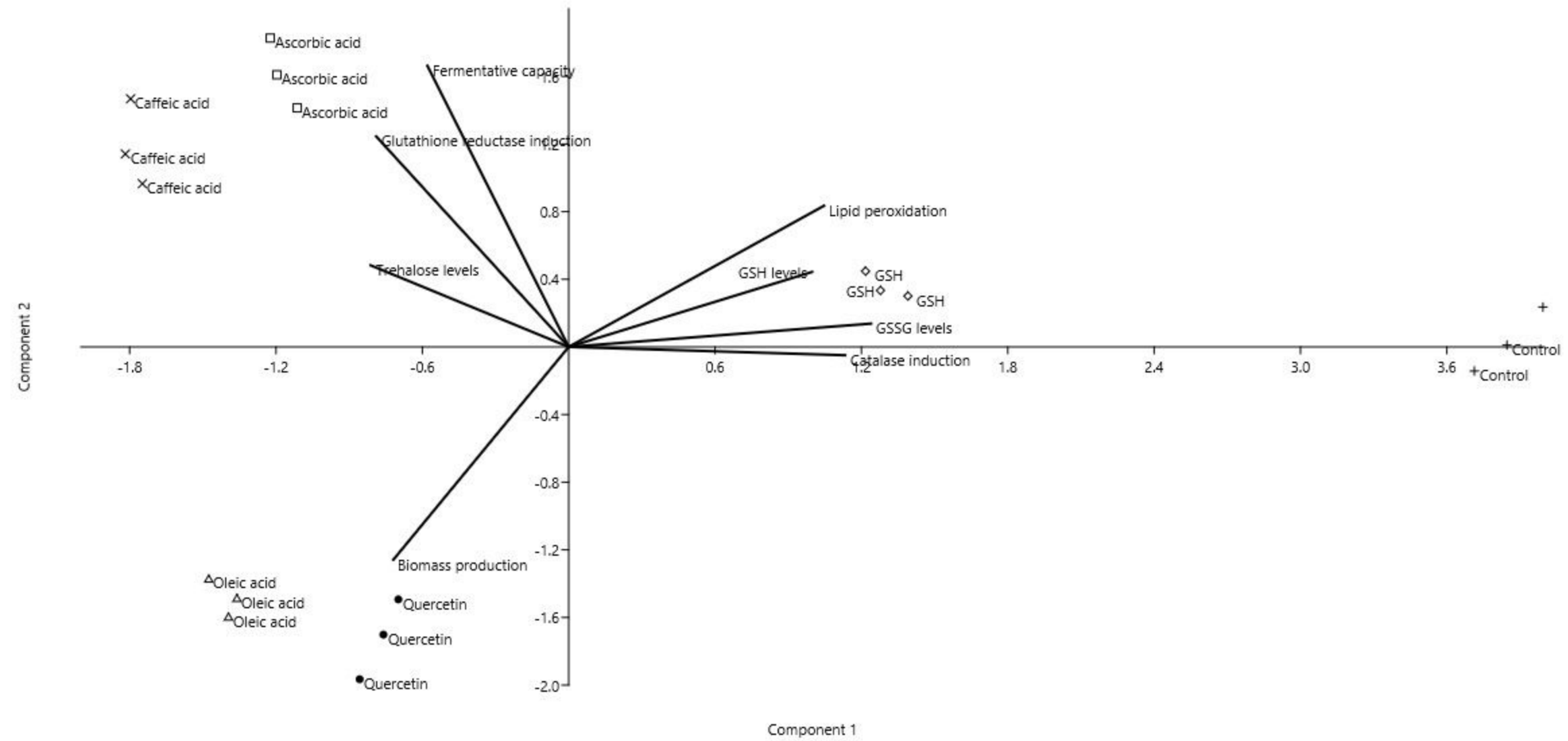
D) D301



E) D128



F) D272



G) P6

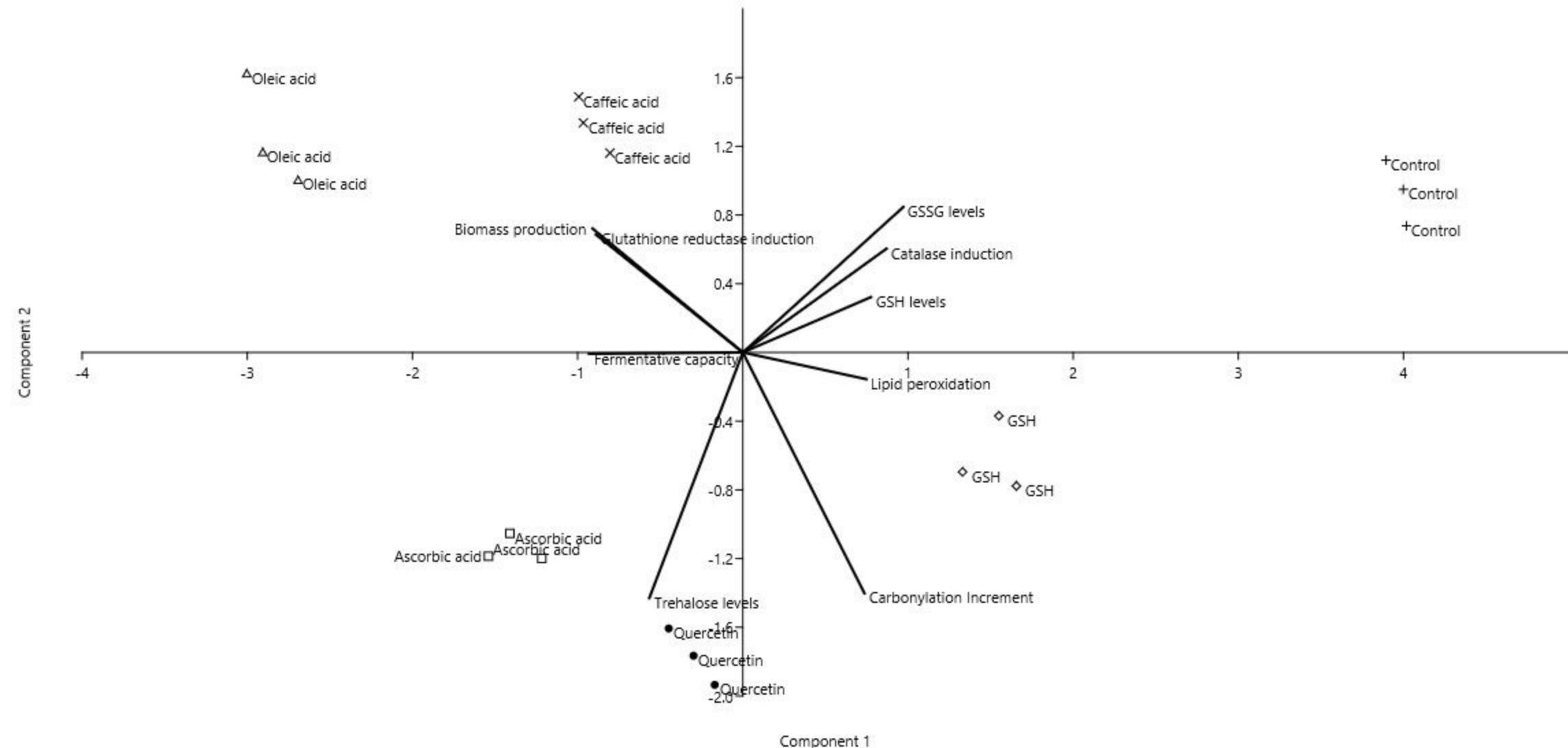


Fig. S1 Principal Components (PCA) statistical analysis of the antioxidant molecules effects on the physiological and biochemical biomarkers for each study strains with a total variance represented of 62%. Component 1 reflects an average 39% total variance (with a positive correlation with ascorbic acid and caffeic acid supplementations) and Component 2 reflects an average 23% total variance (with a positive correlation with oleic acid supplementation). The lines belong to variance of dependent variables or biochemical biomarkers measured (biomass yield, fermentative capacity, lipid peroxidation, protein carbonylation, protective metabolites and enzymatic activities) arranged in two dimensions according to the components 1 and 2. Treatment condition is labelled with different symbols: Control (+); Quercetin (●); Ascorbic acid (□); Caffeic acid (X); Oleic acid (Δ) and GSH (◇). (A) T73; (B) D18; (C) D170; (D) 301; (E) D128; (F) D272 and (G) P6.

Table S1. Technological properties and oxidation biomarkers of ADY from *Saccharomyces* wine strains under molasses supplementation with different antioxidants (Table 1 below)

	Parameter	Control	0.20 mg/mL Quercetin	5 mM GSH
T73	Biomass (OD₆₀₀)	18.42 (± 0.2)	18.42 (± 0.2)	20.19 (± 2.1)
	FC (mL CO₂/10⁷cells)	10.52 (± 0.3)	14.99 (± 0.6)	12.01 (± 2.2)
	LP (pmol MDA/mg protein)	26.85 (± 1.0)	24.10 (± 1.0)	25.85 (± 0.7)
	GSH (nmol/mg cell)	1.67 (± 0.01)	1.21 (± 0.06)	2.28 (± 0.01)
	Trehalose (µg/mg cells)	100.1 (± 9.7)	504.8 (± 3.1)	628.4 (± 22)
	Δ GR (U/mg prot)	-0.52 (± 0.3)	-0.34 (± 0.31)	0.11 (± 0.15)
	Δ Catalase (U/mg prot)	18.96 (± 0.1)	12.21 (± 0.28)	7.79 (± 0.90)
D18	Biomass (OD₆₀₀)	16.64 (± 0.1)	22.94 (± 2.1)	15.81 (± 3.1)
	FC (mL CO₂/10⁷cells)	8.39 (± 0.9)	7.55 (± 0.7)	7.23 (± 1.1)
	LP (pmol MDA/mg protein)	24.11 (± 2.3)	23.29 (± 1.3)	17.31 (± 0.1)
	GSH (nmol/mg cell)	0.91 (± 0.02)	1.31 (± 0.07)	2.20 (± 0.1)
	Trehalose (µg/mg cells)	193.5 (± 10)	175.4 (± 2.3)	83.3 (± 4.0)
	Δ GR (U/mg prot)	-0.17 (± 0.1)	-0.58 (± 0.27)	0.35 (± 0.23)
	Δ Catalase (U/mg prot)	31.26 (± 0.7)	6.16 (± 1.81)	5.36 (± 0.75)
D170	Biomass (OD₆₀₀)	17.61 (± 0.2)	16.07 (± 0.6)	18.50 (± 0.5)
	FC (mL CO₂/10⁷cells)	17.18 (± 0.1)	9.35 (± 0.7)	17.26 (± 1.3)
	LP (pmol MDA/mg protein)	23.34 (± 0.9)	26.71 (± 0.7)	42.95 (± 0.4)
	GSH (nmol/mg cell)	1.24 (± 0.03)	1.18 (± 0.07)	1.18 (± 0.04)
	Trehalose (µg/mg cells)	155.5 (± 2.8)	166.6 (± 21)	80.9 (± 2.1)
	Δ GR (U/mg prot)	2.57 (± 0.7)	1.40 (± 0.13)	2.10 (± 0.30)
	Δ Catalase (U/mg prot)	0.28 (± 1.7)	4.07 (± 0.96)	6.58 (± 3.85)
D301	Biomass (OD₆₀₀)	17.66 (± 0.4)	17.61 (± 0.1)	13.97 (± 0.1)
	FC (mL CO₂/10⁷cells)	3.58 (± 0.1)	2.63 (± 1.2)	1.83 (± 0.1)
	LP (pmol MDA/mg protein)	20.08 (± 1.7)	26.92 (± 0.35)	55.34 (± 1.3)
	GSH (nmol/mg cell)	1.20 (± 0.05)	1.26 (± 0.11)	1.22 (± 0.01)
	Trehalose (µg/mg cells)	141.1 (± 22)	75.3 (± 9.8)	15.3 (± 7.6)
	Δ GR (U/mg prot)	0.89 (± 0.23)	0.38 (± 0.93)	1.40 (± 0.23)
	Δ Catalase (U/mg prot)	67.76 (± 0.4)	27.79 (± 3.72)	15.64 (± 0.60)
D128	Biomass (OD₆₀₀)	14.11 (± 0.1)	23.81 (± 0.1)	33.19 (± 2.6)
	FC (mL CO₂/10⁷cells)	2.33 (± 0.6)	1.97 (± 0.1)	1.26 (± 0.6)
	LP (pmol MDA/mg protein)	22.00 (± 1.8)	11.32 (± 1.9)	22.00 (± 0.6)
	GSH (nmol/mg cell)	0.43 (± 0.05)	1.28 (± 0.13)	1.93 (± 0.29)
	Trehalose (µg/mg cells)	153.8 (± 11)	342.9 (± 1.0)	242.5 (± 2.3)
	Δ GR (U/mg prot)	1.70 (± 0.28)	1.60 (± 0.36)	1.40 (± 0.26)
	Δ Catalase (U/mg prot)	0.39 (± 1.1)	3.52 (± 0.41)	5.98 (± 0.75)
D272	Biomass (OD₆₀₀)	11.26 (± 0.2)	22.13 (± 0.3)	5.57 (± 1.9)
	FC (mL CO₂/10⁷cells)	10.42 (± 0.4)	5.36 (± 1.3)	12.15 (± 1.4)
	LP (pmol MDA/mg protein)	20.83 (± 1.4)	11.11 (± 1.8)	13.03 (± 0.2)
	GSH (nmol/mg cell)	2.42 (± 0.22)	1.13 (± 0.01)	3.04 (± 0.01)
	Trehalose (µg/mg cells)	190.9 (± 2.5)	518.9 (± 10)	386.9 (± 3.6)
	Δ GR (U/mg prot)	1.10 (± 0.20)	1.20 (± 0.05)	1.20 (± 0.06)
	Δ Catalase (U/mg prot)	-2.24 (± 0.3)	2.10 (± 0.36)	2.45 (± 0.01)
P6	Biomass (OD₆₀₀)	13.72 (± 1.1)	24.71 (± 0.2)	24.6 (± 0.6)
	FC (mL CO₂/10⁷cells)	12.53 (± 0.6)	15.07 (± 1.3)	11.65 (± 0.3)
	LP (pmol MDA/mg protein)	22.50 (± 0.9)	18.80 (± 1.4)	16.02 (± 0.7)
	GSH (nmol/mg cell)	3.65 (± 0.38)	1.22 (± 0.21)	4.23 (± 0.03)
	Trehalose (µg/mg cells)	252.6 (± 24)	784.1 (± 2.9)	629.7 (± 4.9)
	Δ GR (U/mg prot)	1.20 (± 0.01)	1.20 (± 0.08)	1.10 (± 0.14)
	Δ Catalase (U/mg prot)	0.064 (± 0.1)	0.91 (± 0.20)	0.80 (± 2.70)

FC (Fermentative capacity); LP (Lipid peroxidation), **GSH (reduced glutathione)** and GR (Glutathione reductase activity). Highlighting indicates significant difference respect to the control from non-supplemented molasses with $p < 0.05$. In brackets SD value from three independent experiments.