



Workshop IPATECH, CRA-ORA Monsampolo del Tronto, 13/02/2014

**Implicazioni biochimiche della trasformazione
con metodi "mild".**

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Introduzione

Per la valutazione di quello che succede al prodotto durante il trattamento di trasformazione si possono usare vari approcci:

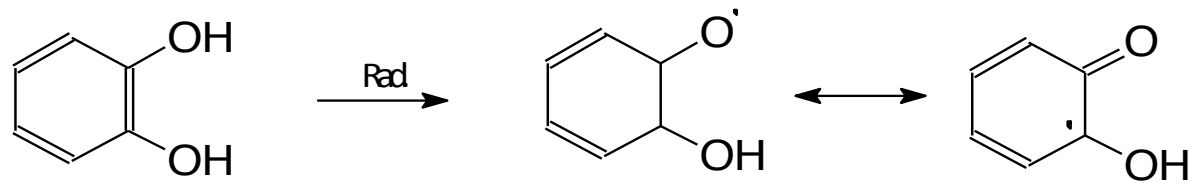
Uno di questi è l'approccio biochimico.

In special modo andare a vedere quello che succede agli antiossidanti può essere utile.

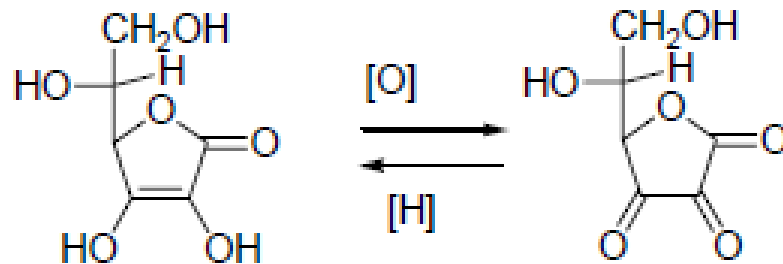
Perchè gli antiossidanti naturali primari sono molecole relativamente meno stabili delle altre.

Ci sono però altri antiossidanti che si possono neoformare durante il trattamento di trasformazione.

Reattività degli antiossidanti



Ascorbic Acid As An Antioxidant



Considerazione importante

Una notevole decomposizione della materia prima si può avere quando il prodotto è lacerato prima del trattamento fisico (caldo o freddo che sia).

Questo perchè la lacerazione dei tessuti provoca una decompartmentazione a livello cellulare che mette in contatto enzimi degradativi e loro substrati, che altrimenti sarebbero separati.

Chemical Composition and Antioxidant Properties of Blood Orange Juice in Relation with Thermal Treatments of Fruit

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Chemical attributes	NT	BL	MW
Ascorbic acid (mg/100 g, HPLC)	50.4 b	52.2 ab	54.3 a
Citric acid (g/l, HPLC)	17.4 a	17.1 a	15.6 b
Total Polyphenolic Index (Folin-Ciocalteu) (mg/l)	1035 b	985 c	1131 a
Total Anthocyanins (mg/l)	160.0 b	157.7 b	176.9 a
Cy-3-Glu/Cy-3-MGlu	0.65 b	0.66 ab	0.68 a
Total cinnamates (mg/l)	353 b	344 b	415 a
Chlorogenic acid (HPLC) (mg/l)	16.3 a	15.0 b	15.4 b
Caffeic acid (HPLC) (mg/l)	1.8 b	2.9 a	1.2 b
p-Coumaric acid (HPLC) (mg/l)	1.7 b	2.4 a	1.9 b
Ferulic acid (HPLC) (mg/l)	15.1 a	11.8 b	14.9 a
Hesperidin (HPLC) (mg/l)	343 b	282 c	554 a
Narirutin (HPLC) (mg/l)	69 a	47 c	60 b

Table 2. Test of antioxidant activity determined by lipooxygenase-linoleic acid (AA) method and DPPH radical quenching after 1 and 15 minutes. Means of four replicates. Numbers in the same column followed by the same letter are not statistically different ($p < 0.05$).

Sample	Inhibition of diene formation at 234 nm (%)	Inhibition DPPH (%) (juices diluted 100-fold after 1 min)	Inhibition DPPH (%) (juices diluted 100-fold after 15 min)
Blank	0.0	0.0	0.0
NT	59.2 b	43.8 c	50.6 c
Blanch	63.3 a	63.3 b	69.3 b
MW	57.3 b	74.4 a	77.9 a

Mirtillo. Cosa succede se scottiamo le bacche prima di ottenere il succo?

no-blanching berries

blanched berries

total anthocyanins:

22.0

mg/100g juice

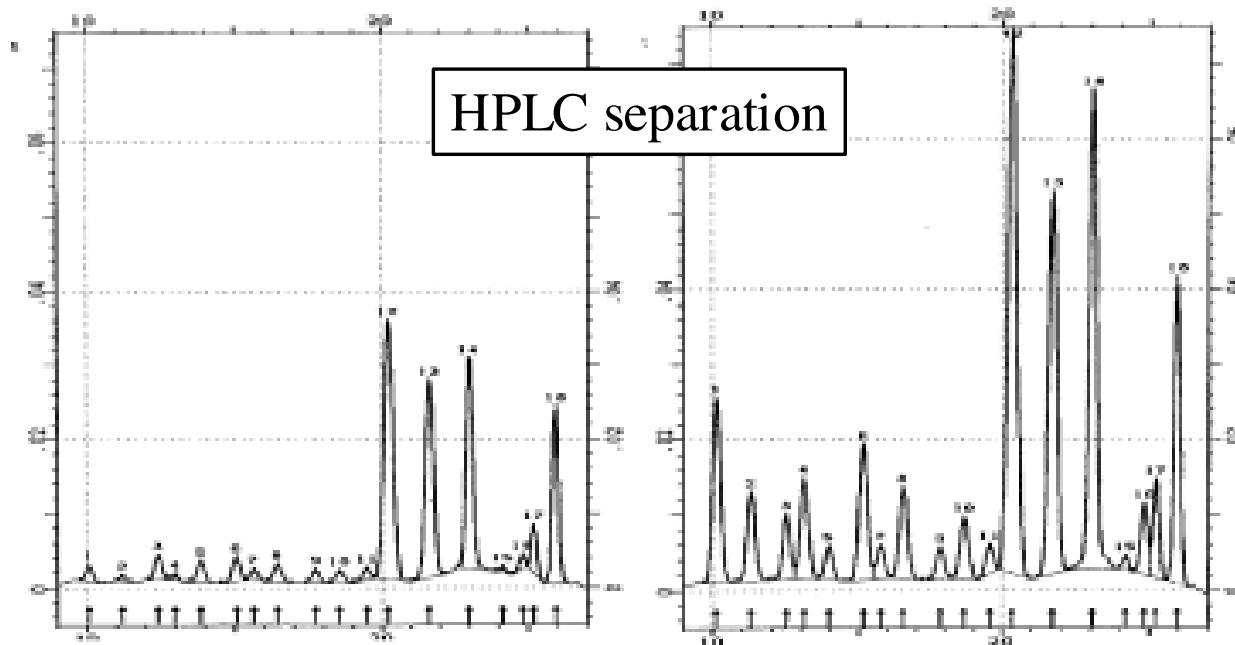
44.8

total cinnamates

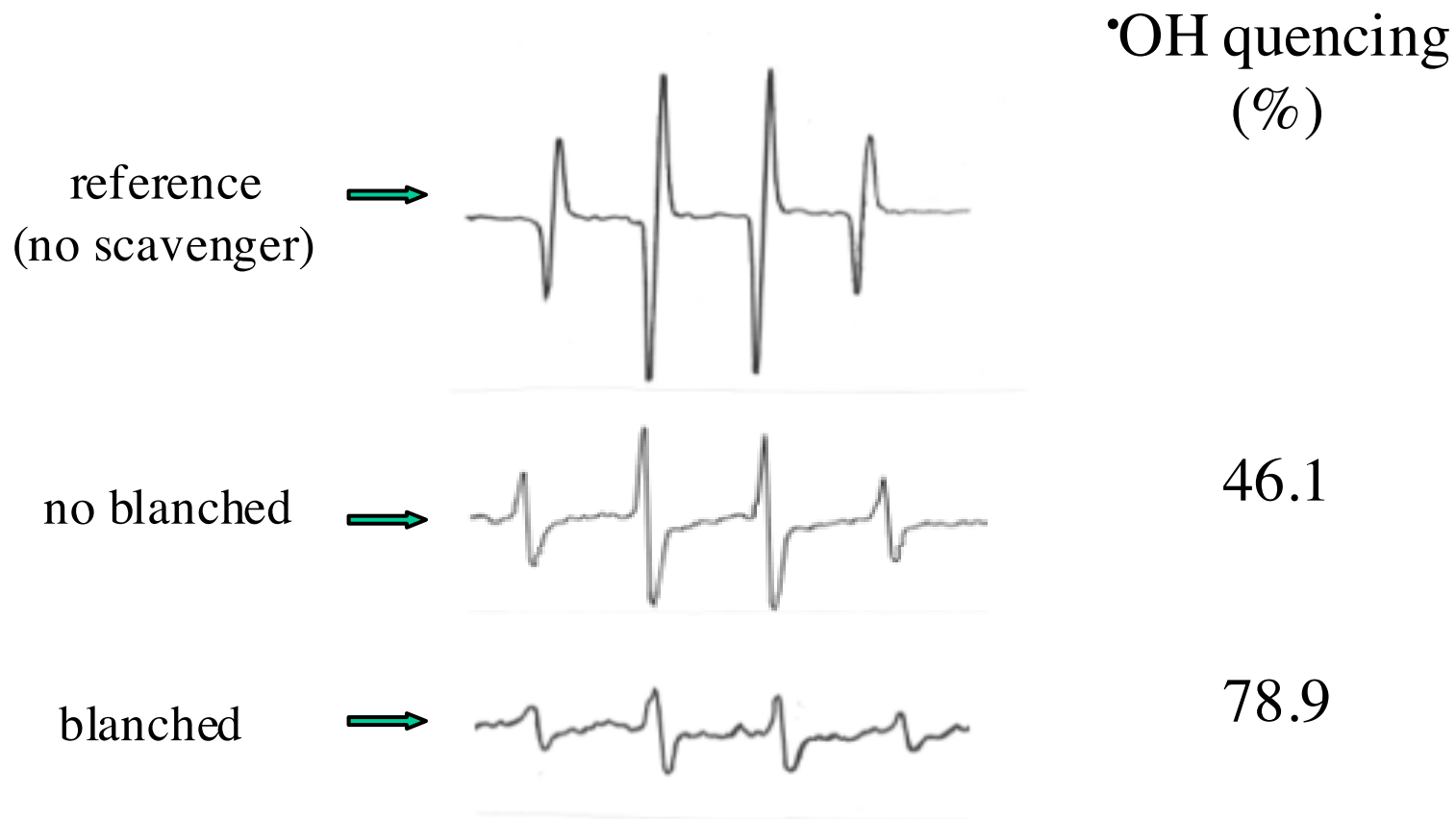
26.0

mg/100 juice

34.8



Antiradical activity of diluted highbush blueberry juice



DPPH• quencing (juice diluted 10-folds):

no-blanchd 69.4%

blanchd 78.9%

Cosa succede durante la cottura della melanzana?



RAW



GRILLED



BOILED

Thermal Treatment of Eggplant (*Solanum melongena* L.) Increases the Antioxidant Content and the Inhibitory Effect on Human Neutrophil Burst

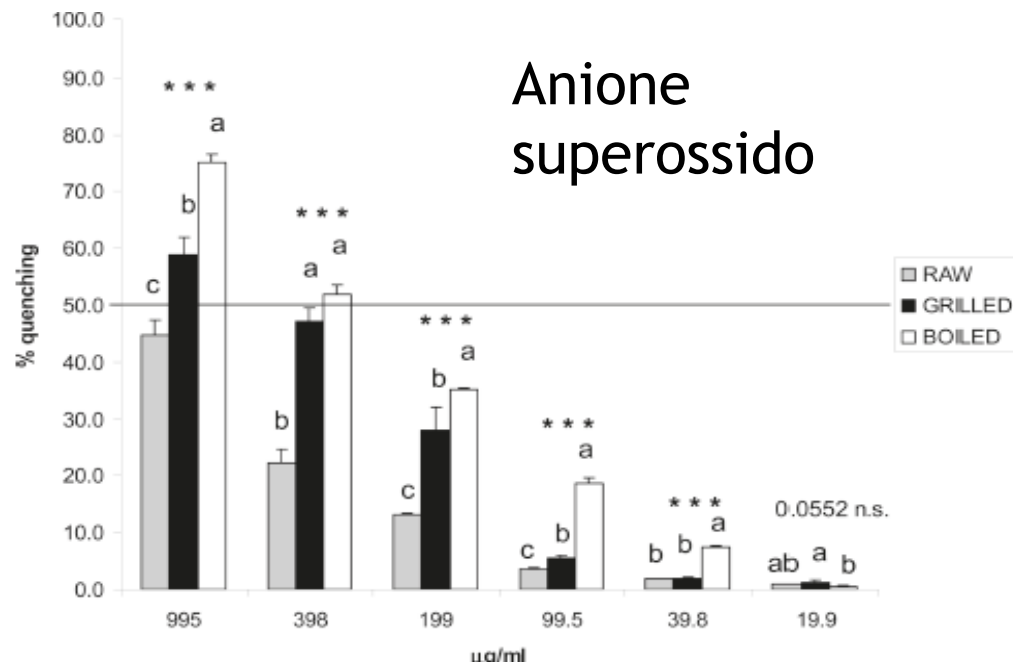
ROBERTO LO SCALZO,^{*,†} MARTA FIBIANI,[†] GIUSEPPE MENNELLA,[‡]
 GIUSEPPE L. ROTINO,[§] MONICA DAL SASSO,^{||} MARIA CULICI,^{||} ALESSANDRA SPALLINO,^{||}
 AND PIER CARLO BRAGA^{||}

Table 2. Phenolic Profile and Glycoalkaloids of the Raw and Processed Eggplant Samples^a

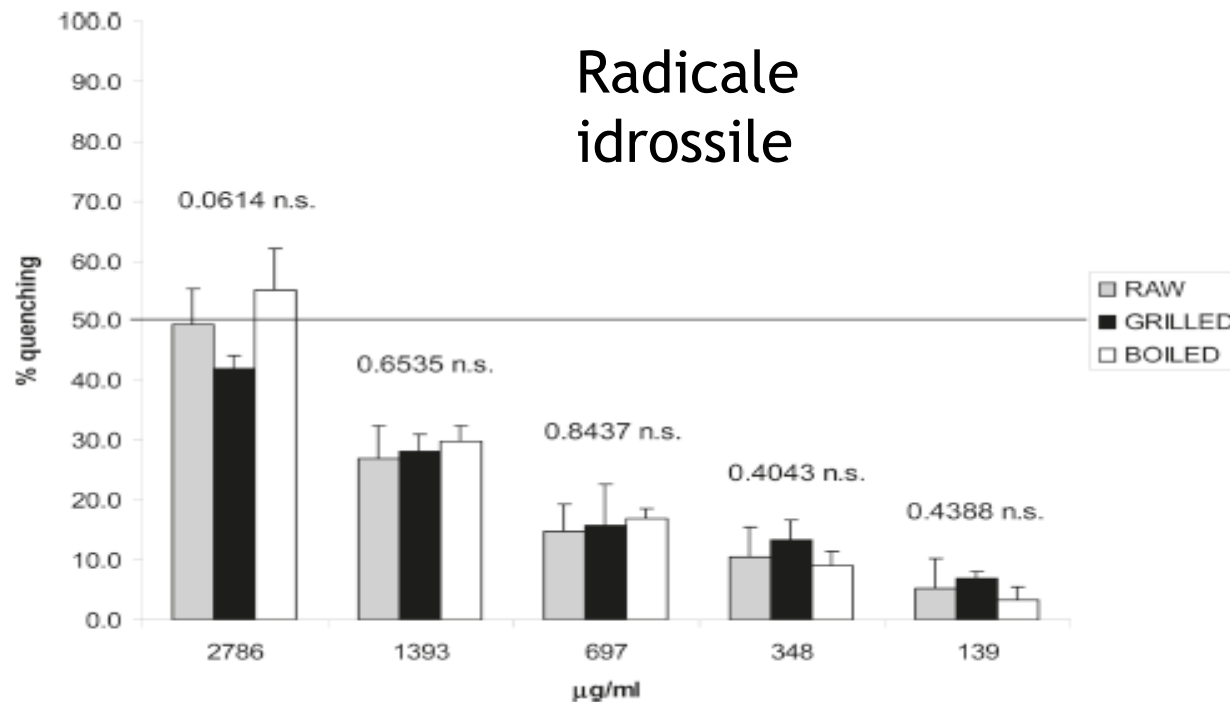
	total polyphenols (mg/100 g of DM)	chlorogenic acid (mg/100 g of DM)	caffeic acid (mg/100 g of DM)	delphinidin-3-rutinoside (mg/100 g of DM)	PPO activity (U/100 mg of DM)	total glycoalkaloids (mg/100 g of DM)
raw	910 cB	154 cC	12.8 cC	90.1 aA	13.3 aA	16.3 cA
grilled	2332 a	710 a	30.1 b	54.0 b	0.1 b	27.3 a
boiled	2119 b	467 b	36.1 a	89.5 a	0.9 b	20.0 b
normalized data in relation to the DM of raw samples						
grilled	1803 A	549 A	23.3 B	41.7 B	0.1 B	21.1 A
boiled	1991 A	439 B	33.9 A	84.1 A	0.8 B	18.8 A

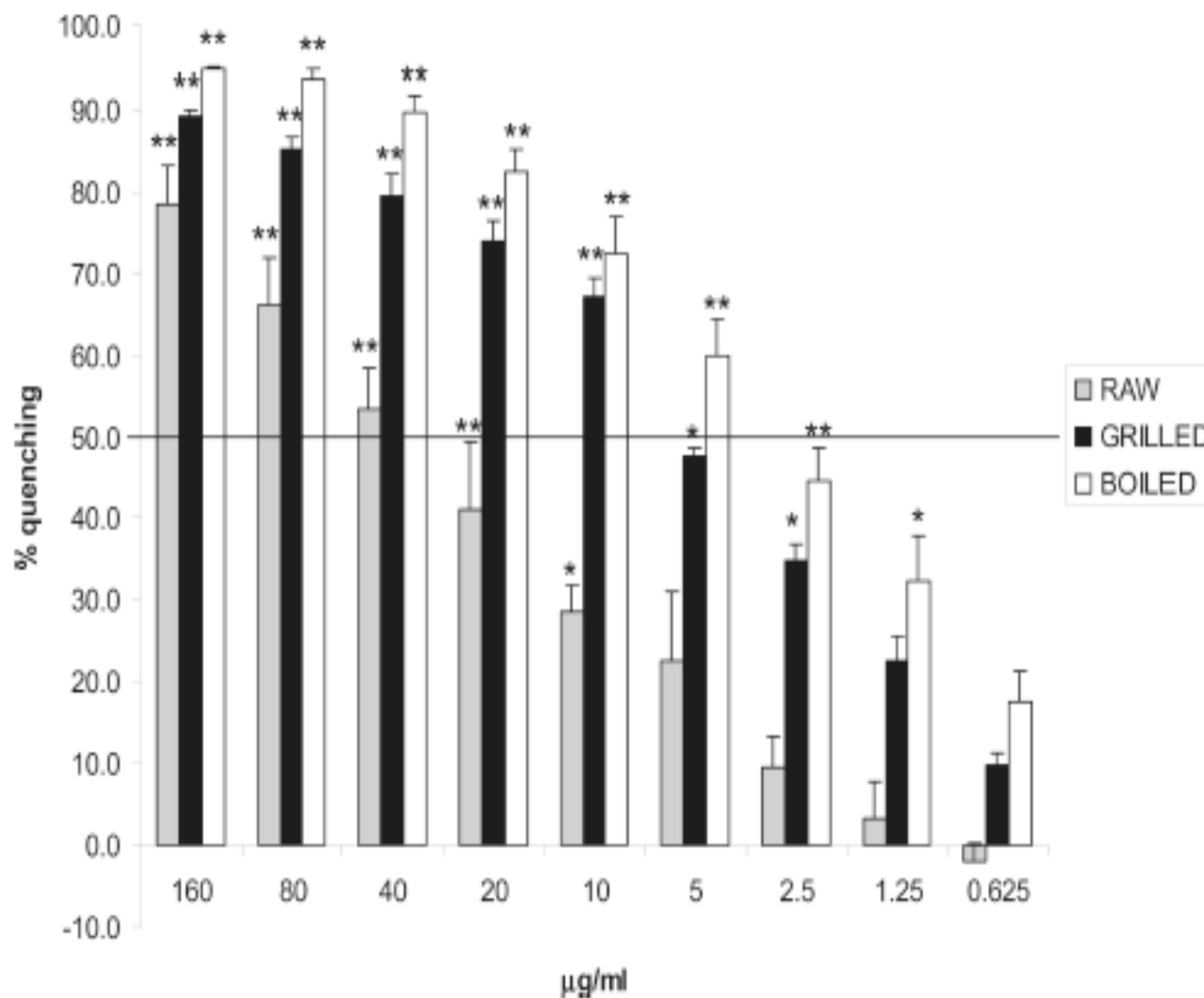
^aThe different letters indicate, for each column, significant differences according to Tukey's test ($p < 0.05$). Lowercase letters indicate the difference between non-normalized data, and capital letters indicate the differences between normalized data.

Anione superossido



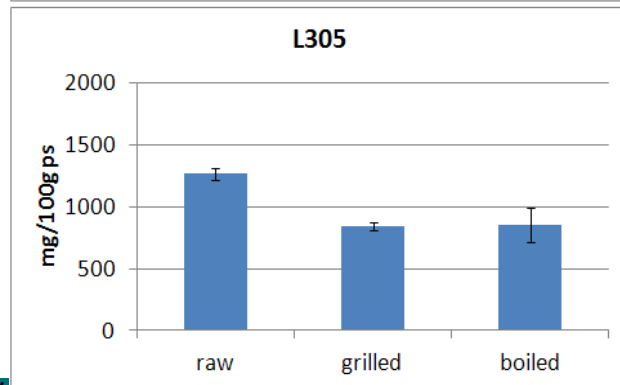
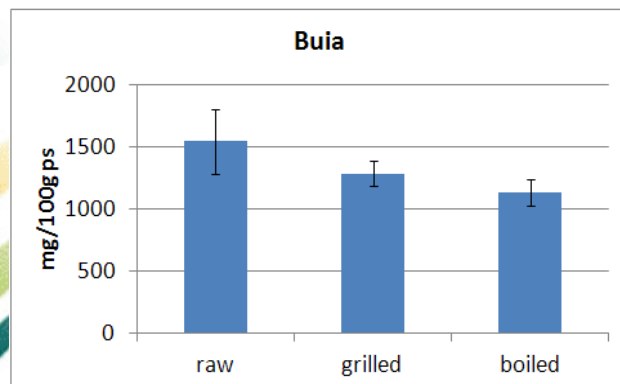
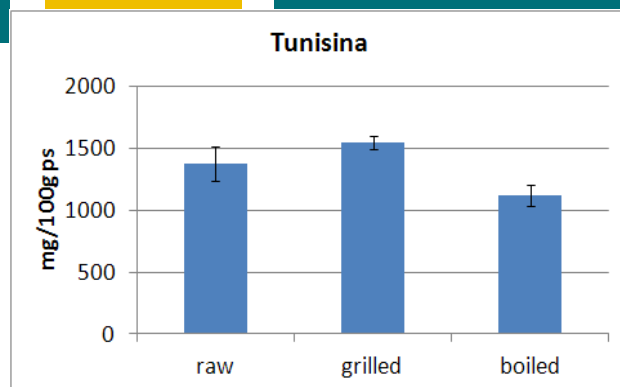
Radicale idrossile



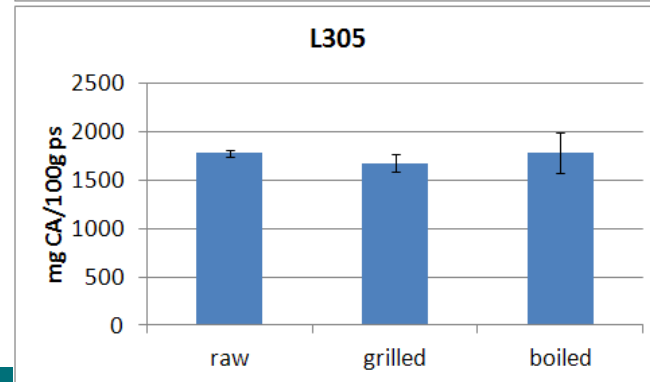
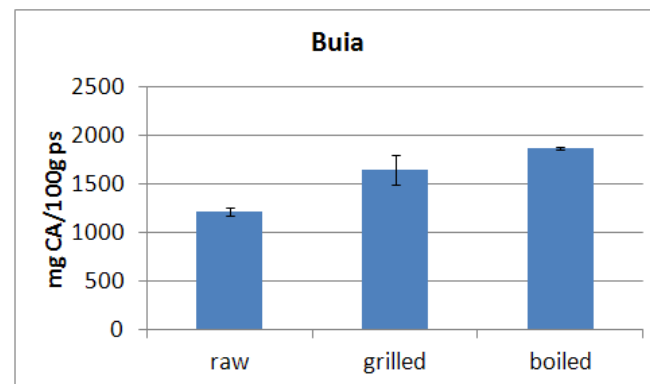
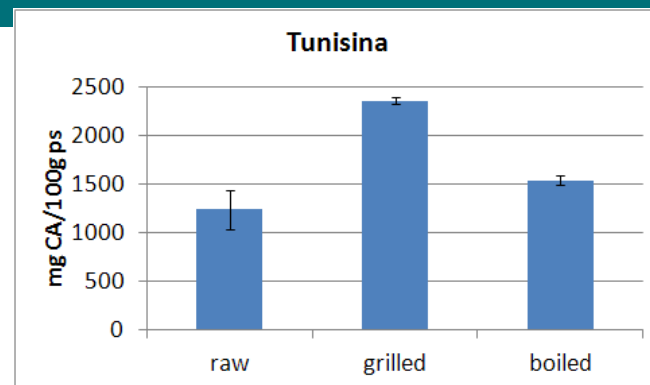


LACL su neutrofili umani

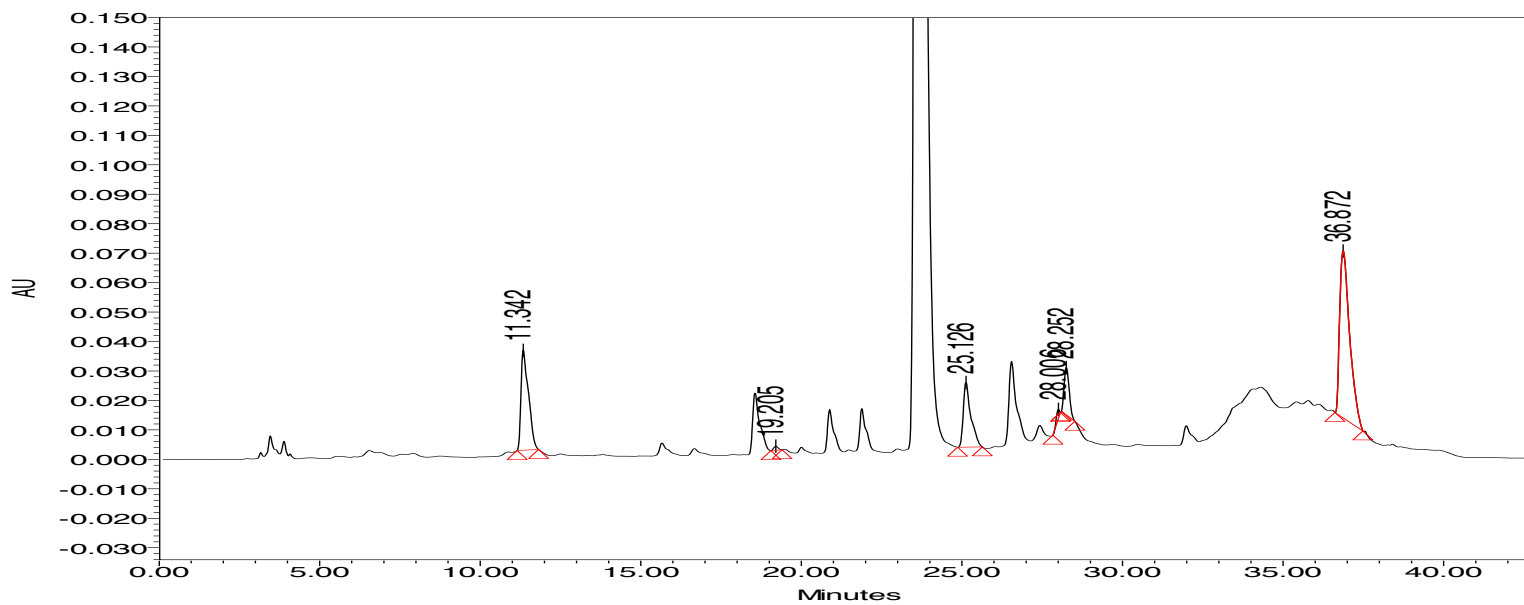
Acido clorogenico



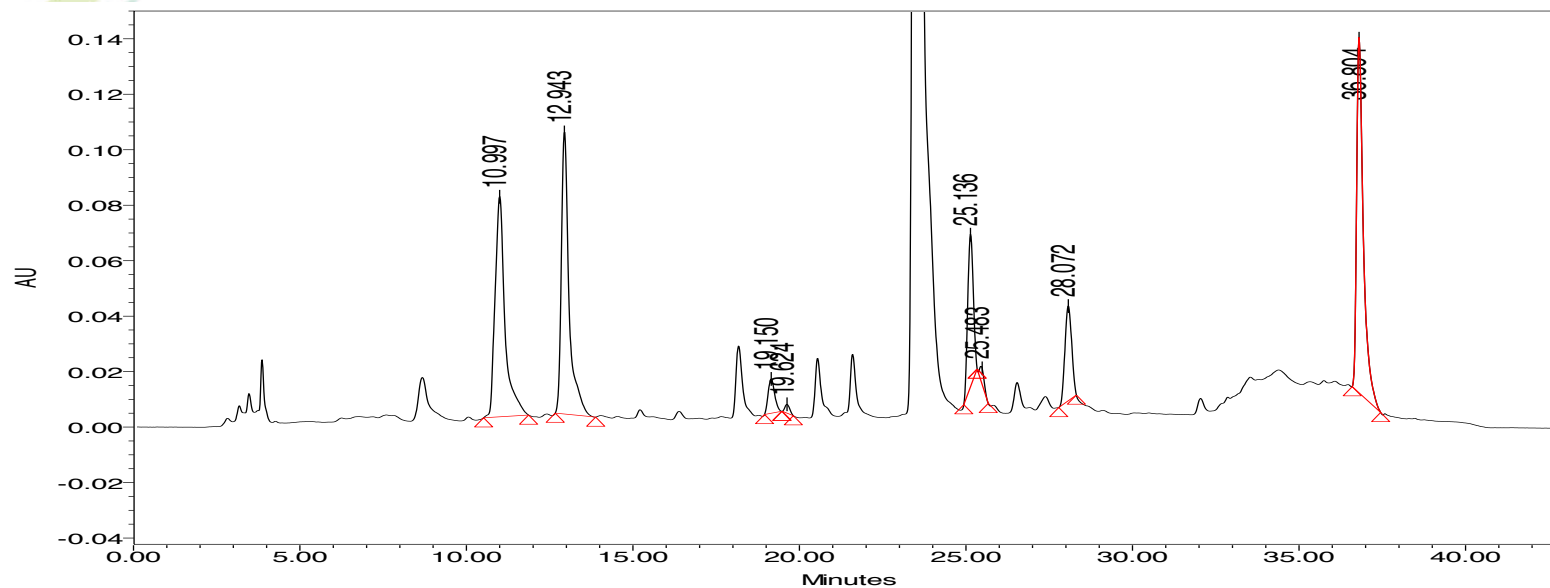
Anione superossido



Melanzana cruda



Melanzana grigliata



Esperimento in rilassometria NMR

		a	% variation	b	% variation	$\tau_c \cdot 10^{-8}$ (s)	% variation
Tunisina	raw	1.6		1463		0.395	
Tunisina	grilled	3.4	113	801	-45	1.000	153
Tunisina	boiled	4.4	175	788	-46	1.070	171
Buia	raw	0.4		1400		0.513	
Buia	grilled	14.9	3927	904	-35	0.881	72
Buia	boiled	4.0	981	1088	-22	0.718	40
L305	raw	4.3		773		0.604	
L305	grilled	14.8	244	587	-24	0.333	-45
L305	boiled	4.4	2	788	2	1.060	75





CABALINGA



TQ.
PRESS.
ATB.



TQ
SOTTO
VUOTO



SCOTTATA
PRESS.
ATB.



SCOTTATA
SOTTO
VUOTO



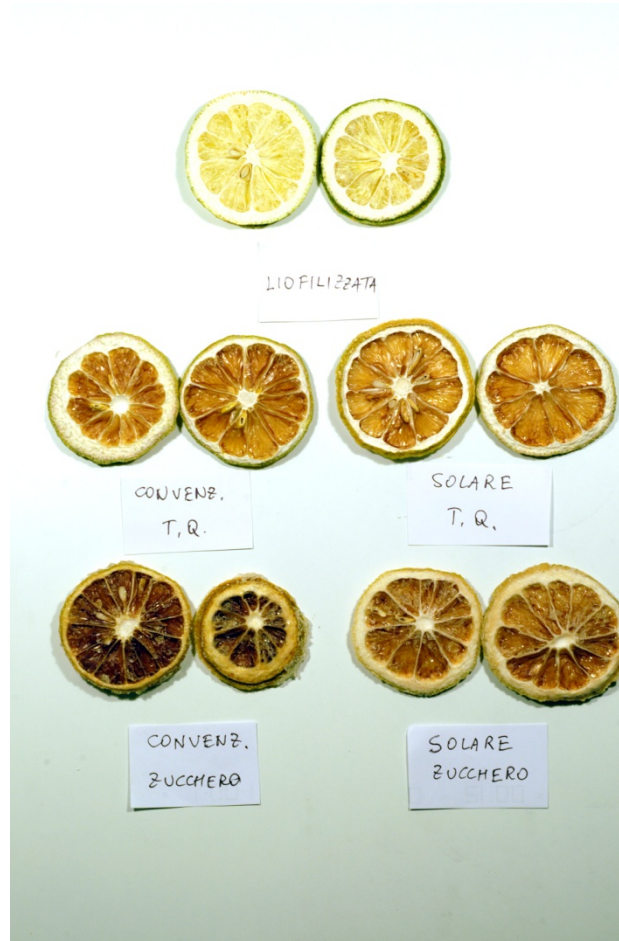




Table 3. Panel test results on blood orange juice. Means of 13 panelists' descriptions. Numbers followed by the same letter are not statistically different ($p < 0.05$).

Samples	Color	Aroma	Sweetness	Acidity	Off-flavors
NT	2.83 a	2.58 a	4.20 a	4.51 a	2.48 a
Blanch	1.62 a	3.01 a	3.99 a	4.20 a	1.41 a
MW	2.11 a	3.01 a	4.52 a	3.49 a	1.53 a