

FERRARA, UN TERRITORIO IN SIMBIOSI CON IL SUO FIUME

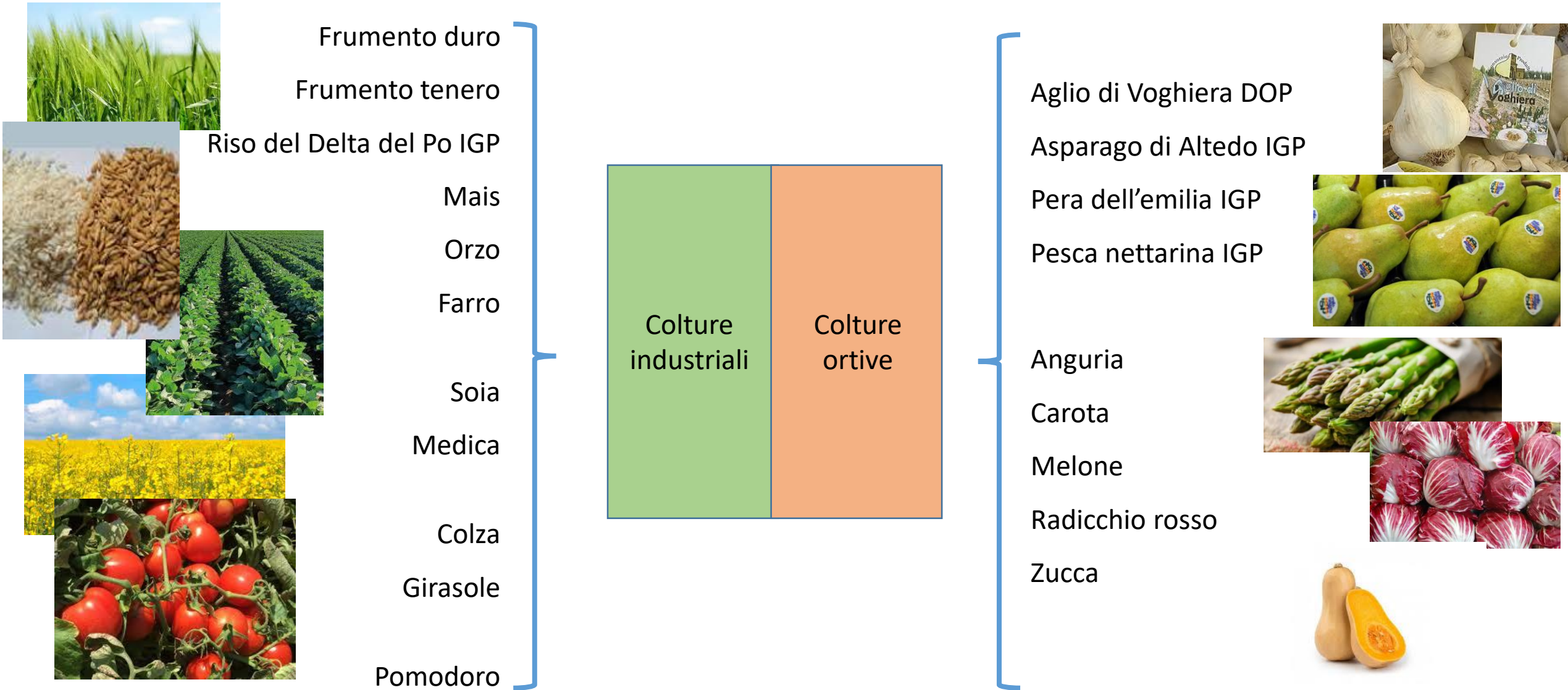


**Ricerca scientifica e tutela della qualità agro-alimentare:
verso una valorizzazione integrata delle eccellenze del
territorio.**

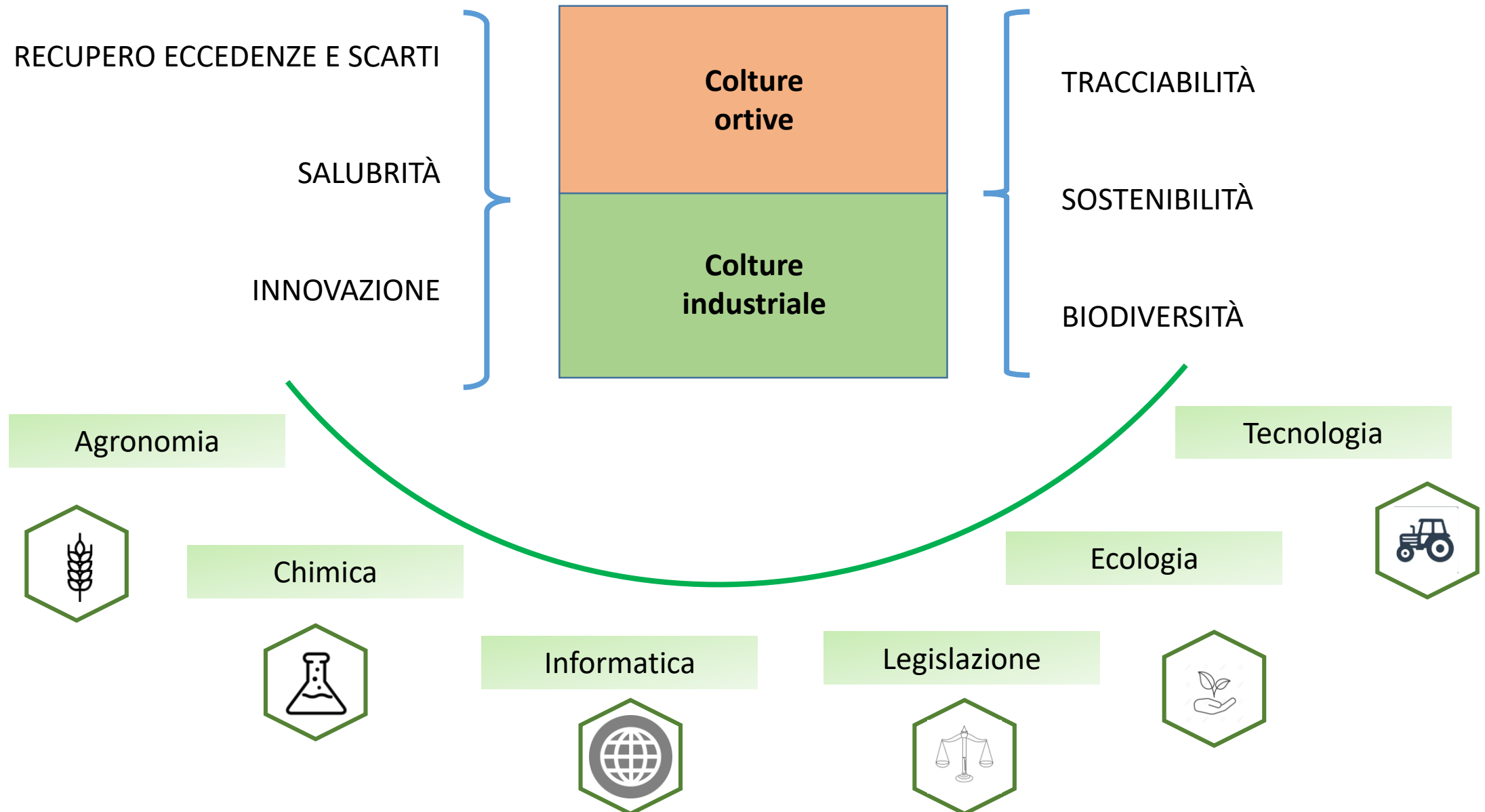
-Annalisa Maietti-

Ferrara.....un territorio agricolo

Il settore agricolo interessa l'intero territorio provinciale che, storicamente, è un'area a vocazione agricola da secoli, con parti coltivate da molto tempo ed altre di bonifica più recente.

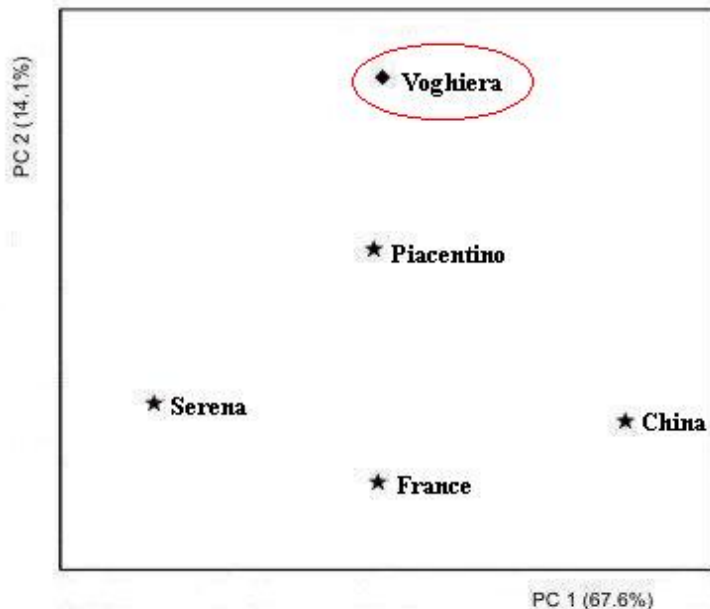


Valorizzazione e tutela



Aglio di Voghiera DOP

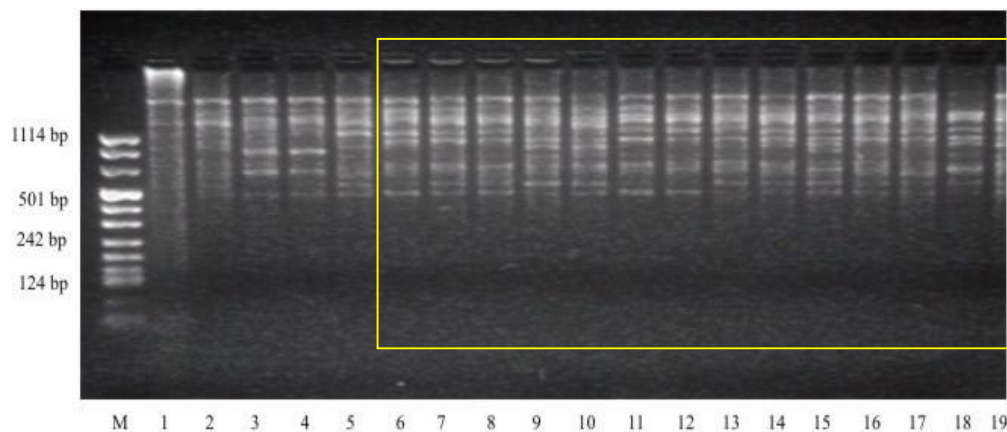
COMPOSIZIONE BROMATOLOGICA



RISANAMENTO TERMOTERAPICO



CARATTERIZZAZIONE GENETICA



DOP

Iscrizione Registro Varietale



Doc. n. 22-7-1929
Luigi Boglietti
Voghiera
La presente per domandarsi se
avete aglio indicandomi il prezzo
più ristretto
In attesa con stima vi saluto
Luigi Boglietti

Progetti di sviluppo

✓ Studi di miglioramento della conservabilità

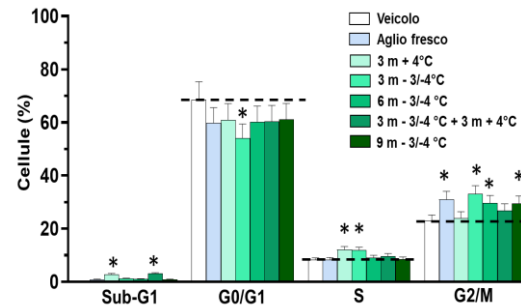
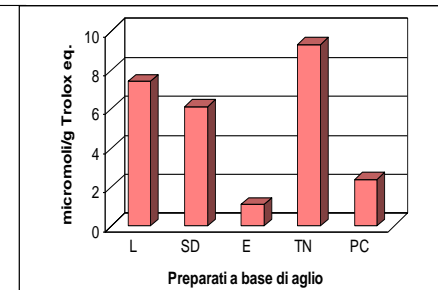
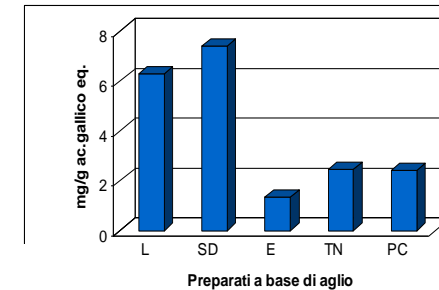
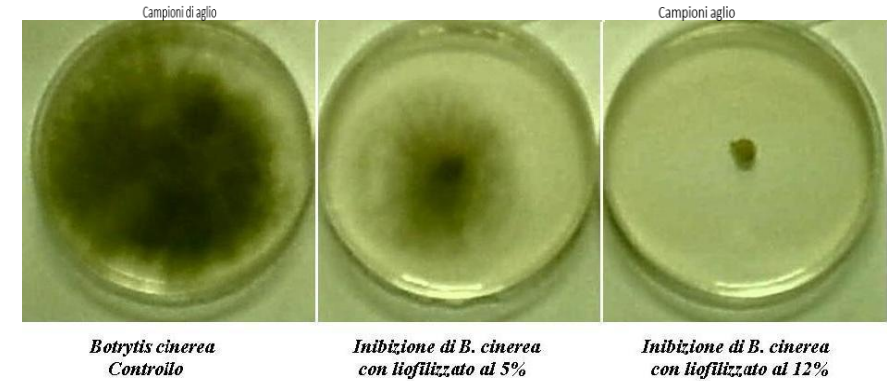
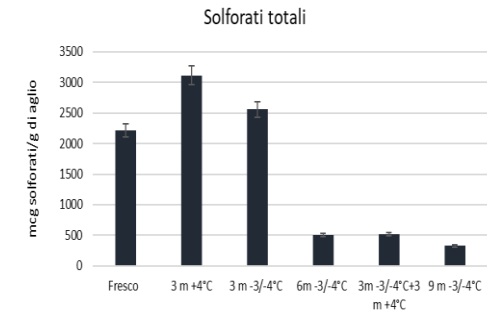
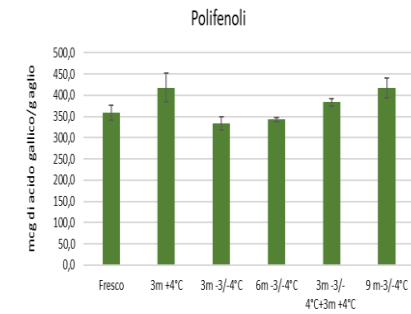
✓ Preparazioni a base di aglio per:

- studi di attività antifungina

- utilizzo in ambito alimentare e farmaceutico



Studi in vitro di attività antitumorale



Contenuto in polifenoli (sinistra) e Capacità antiossidante totale (destra) in diversi preparati a base di aglio di Voghiera a confronto con un prodotto commerciale. L: Liofilizzato; SD: Essiccato con metodo spray drying; E: Estratto con etanolo al 65%; TN: Tuniche; PC: Prodotto commerciale.

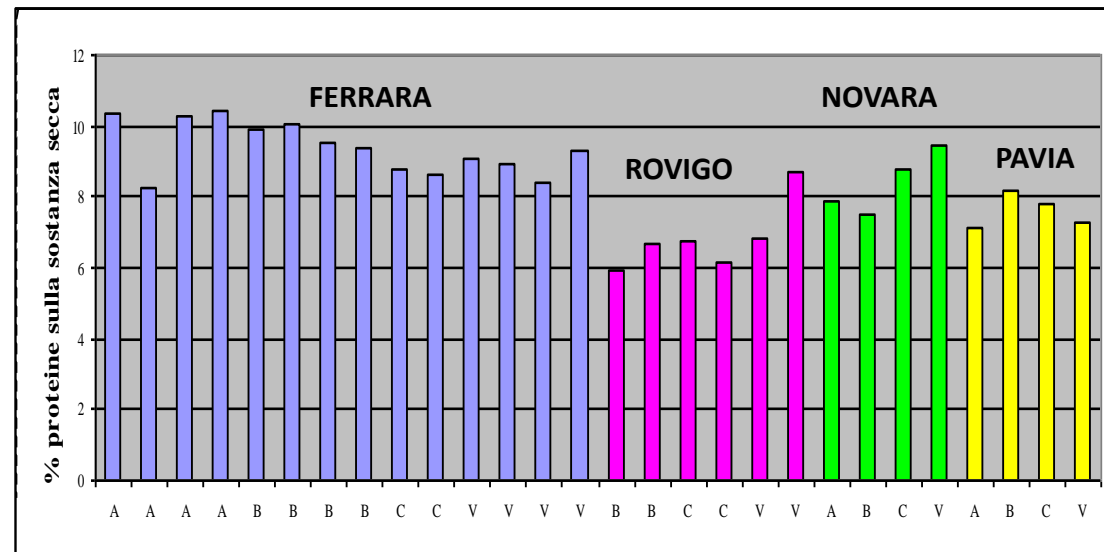
Riso del Delta IGP

Analisi quantitative

- sostanza secca
- umidità relativa
- ceneri (frazione minerale)
- lipidi (metodo Soxhlet)
- proteine (metodo Kjeldahl)
- metalli (AAS)
- acidi grassi (gascromatografia)

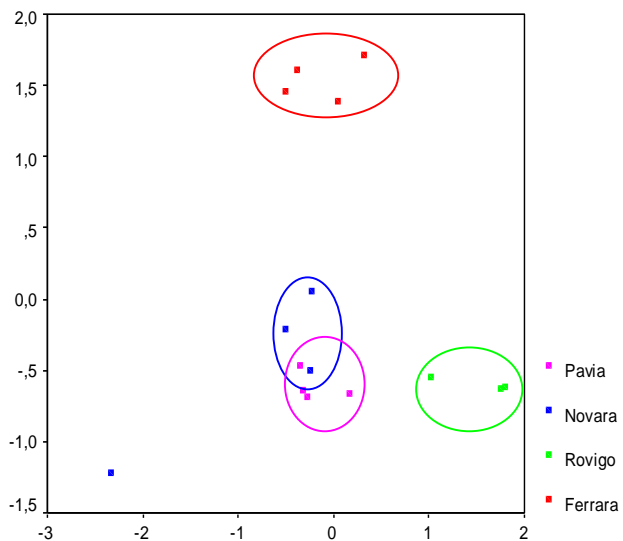
PROTEINE

Mg e Ca

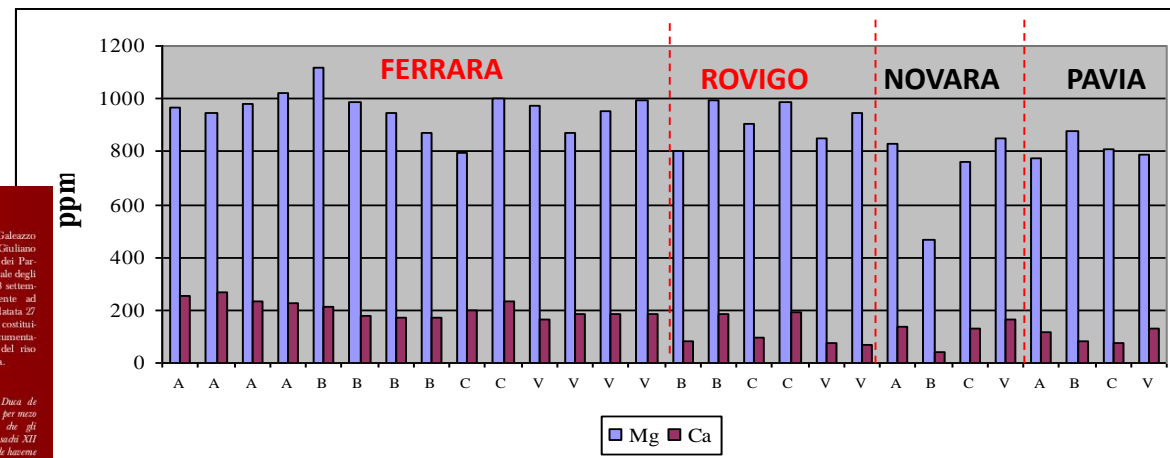
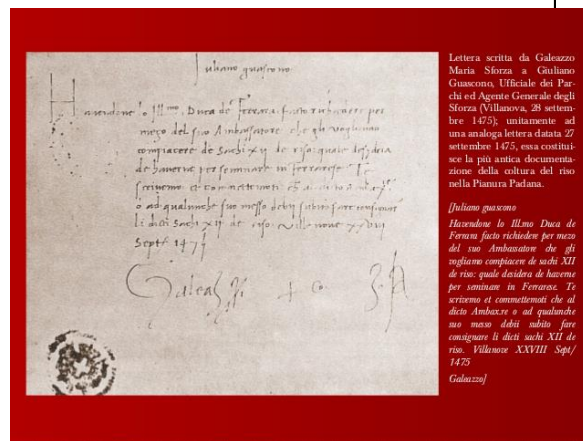


A = ARBORIO B = BALDO C = CARNAROLI V = VOLANO

COMPOSIZIONE BROMATOLOGICA



REGR factor score 2 for analysis 1



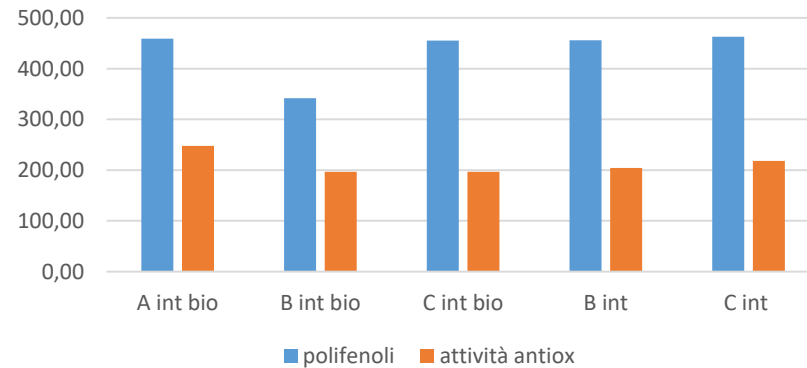
A = ARBORIO B = BALDO C = CARNAROLI V = VOLANO

MIGLIORAMENTO DELLA COMPETITIVITÀ DEL RISO DELL'AREA DEL DELTA DEL PO ATTRAVERSO LA DIVERSIFICAZIONE CON NUOVI PRODOTTI BIOLOGICI CONNOTATI DA ASPETTI NUTRACEUTICI.

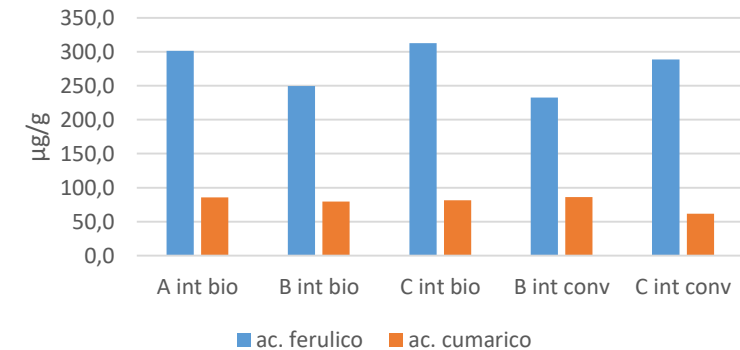


campioni	umidità g/100g±ds	proteine g/100g±ds	ceneri g/100g±ds	lipidi g/100g±ds	fibra totale g/100g±ds	amido totale g/100g±ds
Arborio convenzionale	11,34±0,02	8,45±0,74	4,28±0,09	1,50±0,07	22,21±2,10	52,02±6,87
Baldo convenzionale	11,35±0,05	8,23±0,56	4,12±0,04	1,91±0,06	15,39±0,32	53,15±1,37
Carnaroli convenzionale	11,31±0,09	7,15±0,28	4,05±0,04	1,48±0,02	20,01±0,75	51,48±3,54
Arborio biologico	12,74±0,19	6,87±0,05	4,15±0,37	1,77±0,16	21,78±0,58	50,32±2,43
Baldo biologico	14,42±0,21	5,46±0,60	4,00±0,19	1,60±0,37	18,17±0,16	50,23±3,74
Carnaroli biologico	13,13±0,09	6,40±0,22	4,54±0,21	1,74±0,11	19,40±2,31	49,05±0,51

antiossidanti



acidi cinnamici

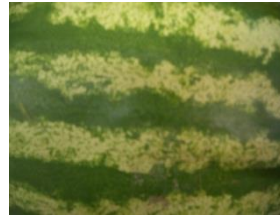


ANGURIA REGGIANA IGP



Valutazione dei caratteri morfologico-strutturali:

Striature buccia

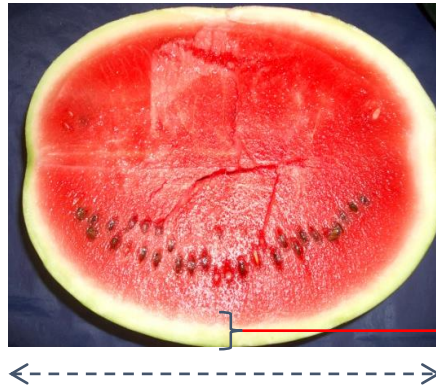


Peso (Kg)

Diametro (cm)

Lunghezza (cm)

Pericarpo (cm)



Diametro
(cm)

Pericarpo (cm)

Area % polpa

Lunghezza (cm)

Consistenza (Kg/cm²)

Qualità polpa (croccantezza, succosità)

Colore

Analisi dei contenuti bromatologico-salutistici:

- **Analisi qualitative:** Sostanza secca, Proteine, Ceneri Brix, pH, acidità

- **Analisi della frazione minerale**

- **Analisi quali-quantitative specialistiche sulla polpa:**

Carotenoidi (beta-carotene, licopene)

Vitamina C

Polifenoli totali,

Attività antiossidante

Acidi organici



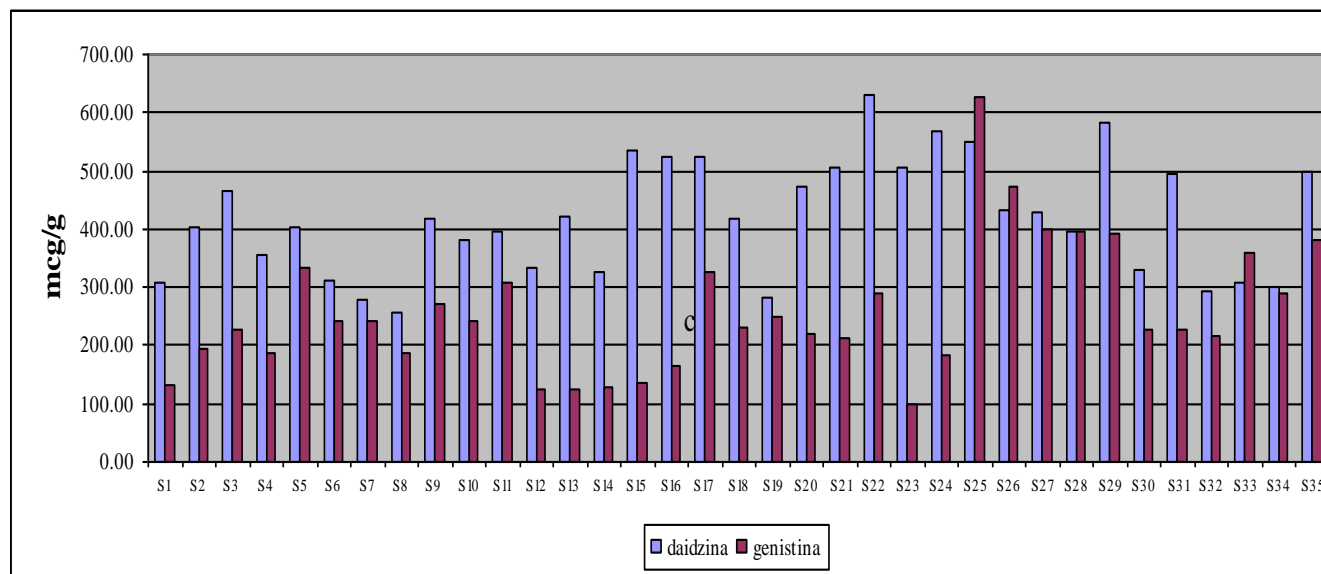
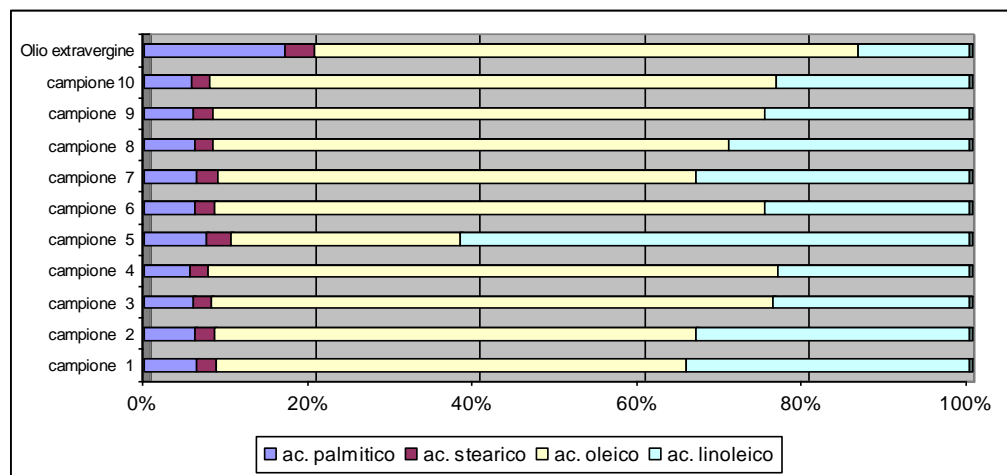
CONFRONTI VARIETALI

PROGETTI REGIONALI

- Salvaguardia della biodiversità: studio ricerca e valorizzazione di antiche varietà cerealicole tradizionali (MAIS-FRUMENTO)
- *Ricerca e studio di prodotti di alto valore aggiunto ottenibili da nuove varietà di *Carthamus tinctorius**
- Caratterizzazione di varietà commerciali di soia per la loro valorizzazione negli ambiti agronomico, zootecnico, dietetico, nutriceutico, fitofarmaceutico, cosmeceutico e industriale (attività a supporto ed integrazione della rete nazionale)

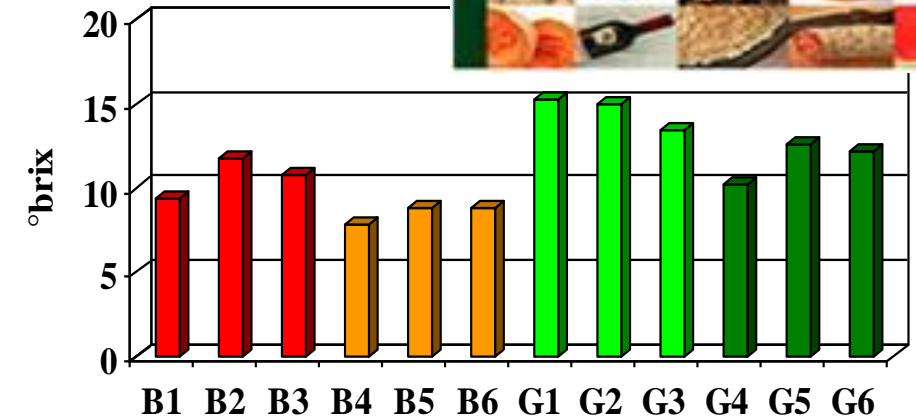
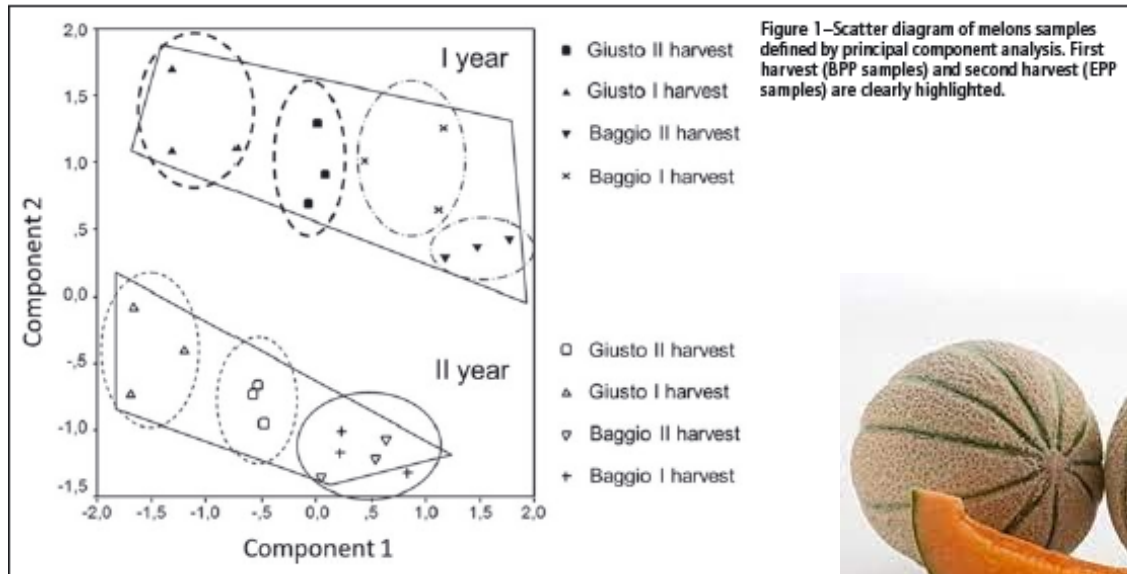


PROFILO LIPIDICO DI VARIETA' E IBRIDI DI CARTAMO (*Chartamus tinctorius*)

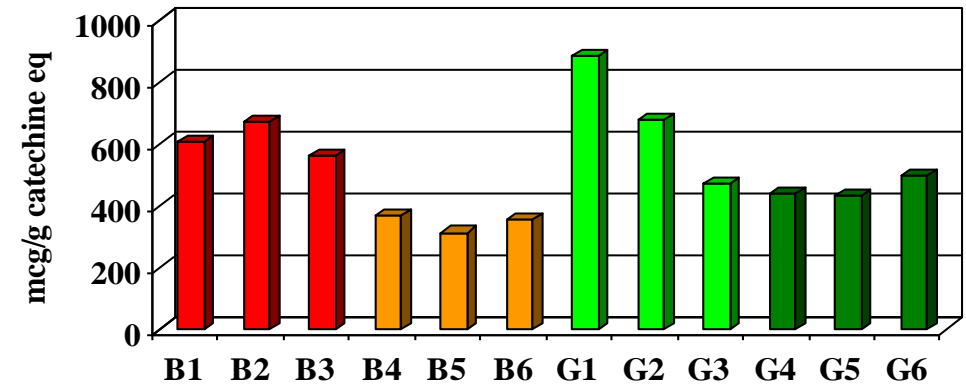


STUDIO E VALORIZZAZIONE DI PRODOTTI TIPICI DEL COMPRENSORIO FERRARESE

Analytical Traceability of Melon (*Cucumis Melo* Var *Reticulatus*): Proximate Composition, Bioactive Compounds, and Antioxidant Capacity in Relation to Cultivar, Plant Physiology State, and Seasonal Variability



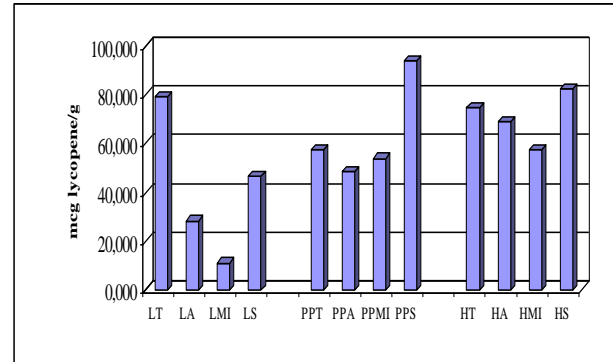
Contenuto zuccherino espresso in °Brix (CV%<2).



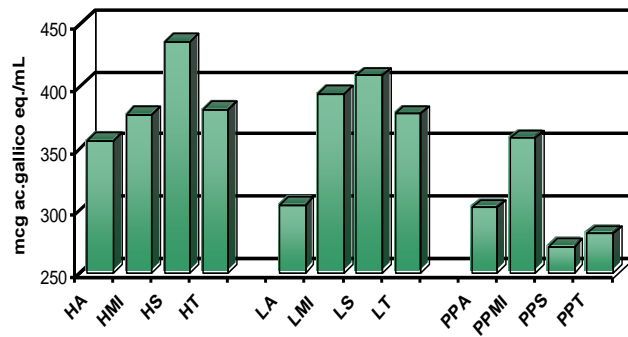
Contenuto in polifenoli totali espresso in $\mu\text{g/g}$ di catechina eq. (CV% \leq 3).

CARATTERIZZAZIONE CHIMICO-NUTRIZIONALE DI VARIETA' DI POMODORO DA INDUSTRIA

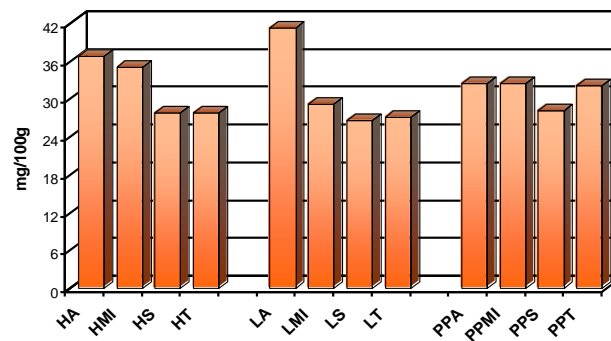
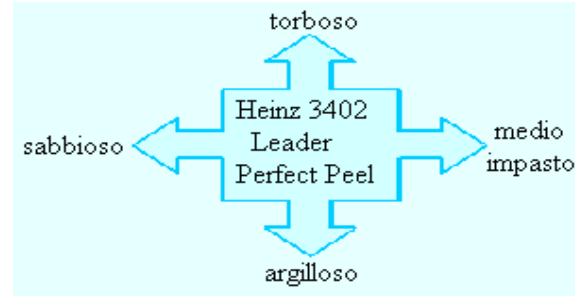
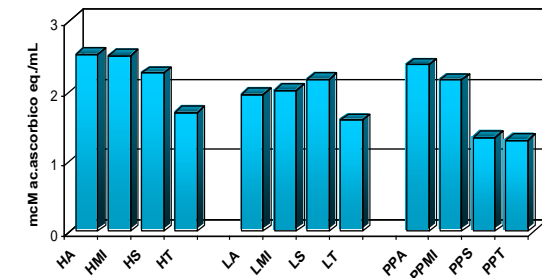
Carotenoidi totali



Polifenoli totali



Capacità antiossidante



Vitamina C

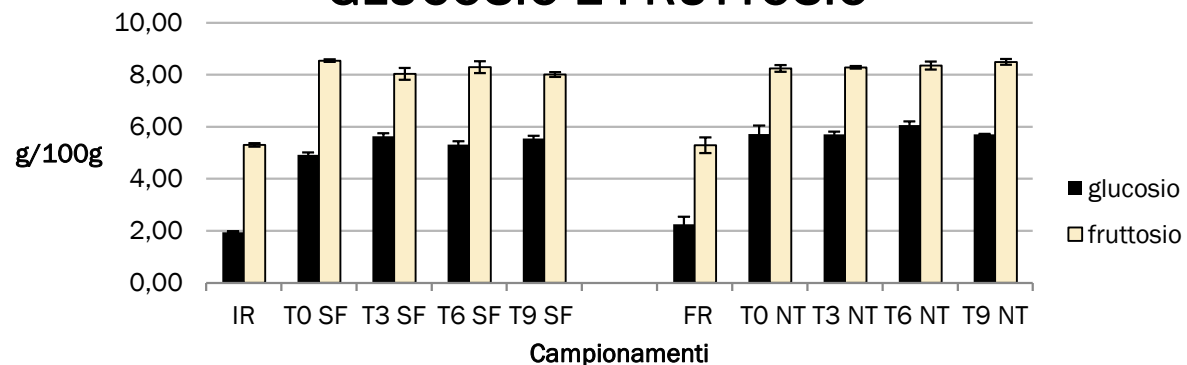
L= Leader;
PP= Perfect Peel;
H= Heinz 3402;

T= terreno torboso;
A= terreno argilloso;
MI= terreno a medio impasto;
S= terreno sabbioso.

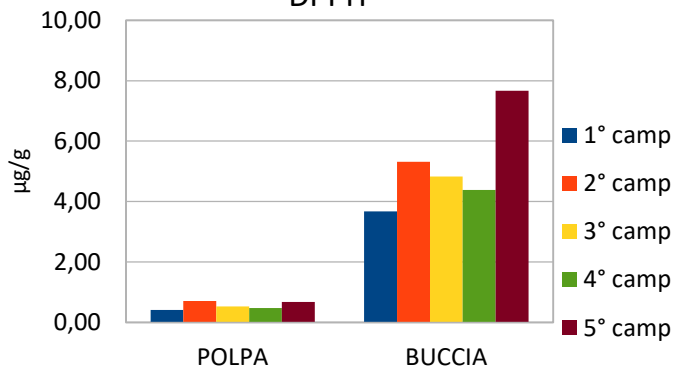
Confronto conservabilità del prodotto in cella frigorifera e con tecnologia smart fresh

PERA

GLUCOSIO E FRUTTOSIO

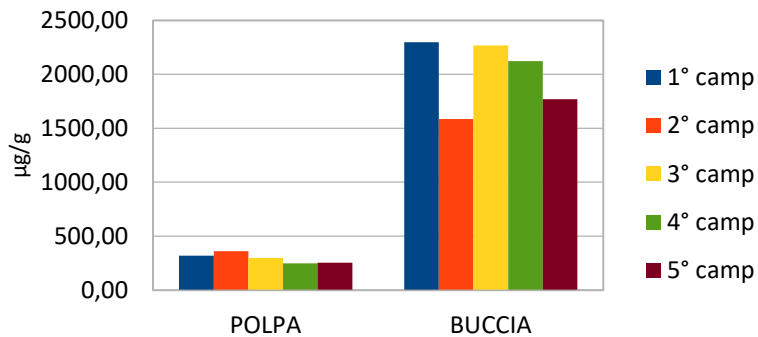


DPPH

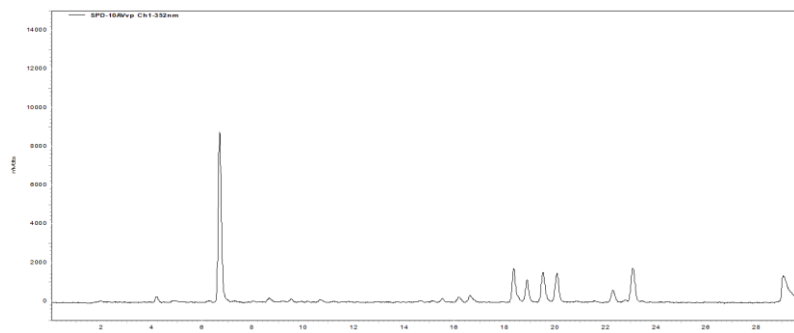
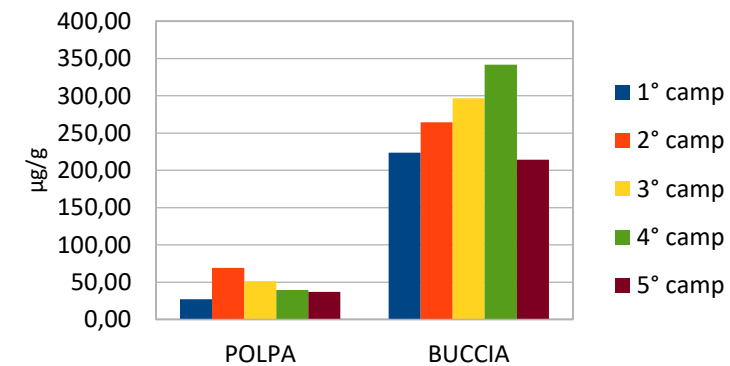


**Più FRUTTA...
CON LA BUCCIA!!!!**

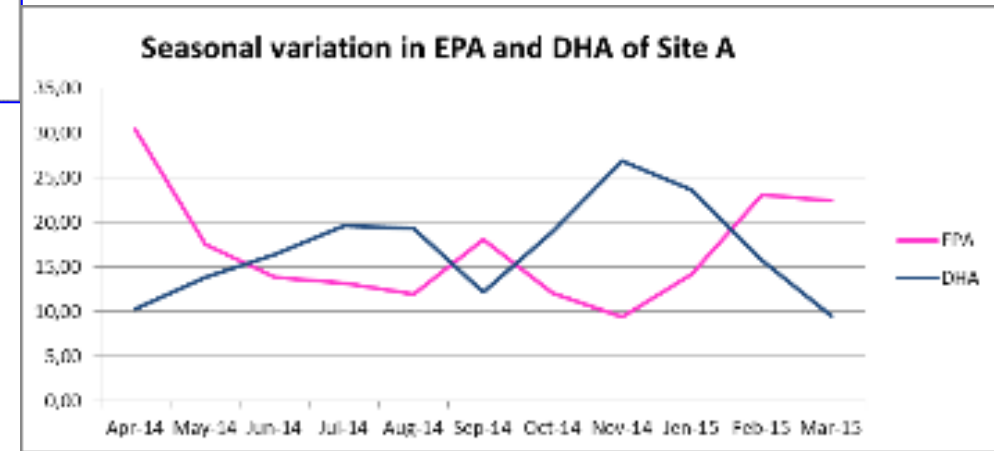
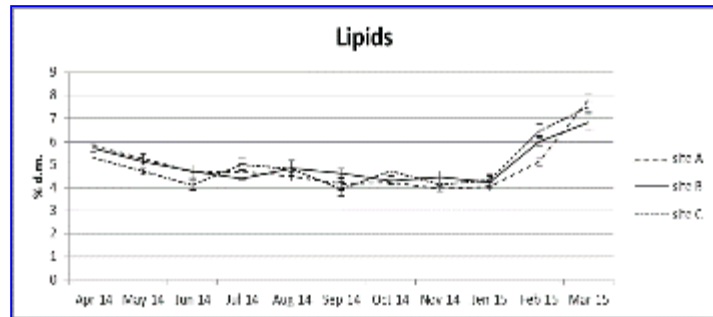
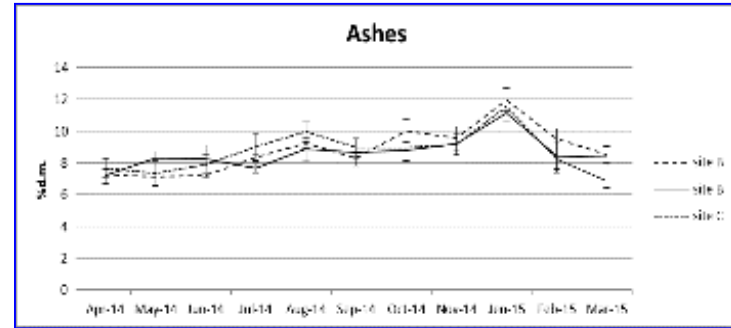
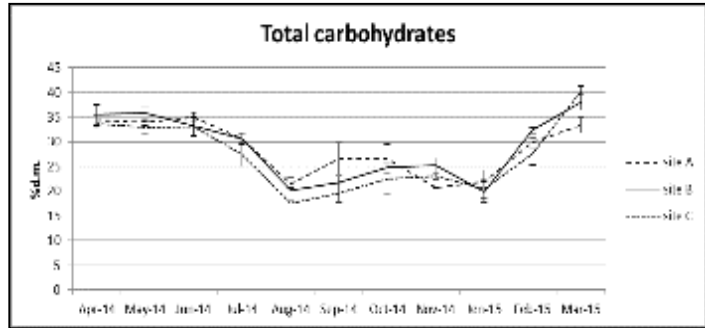
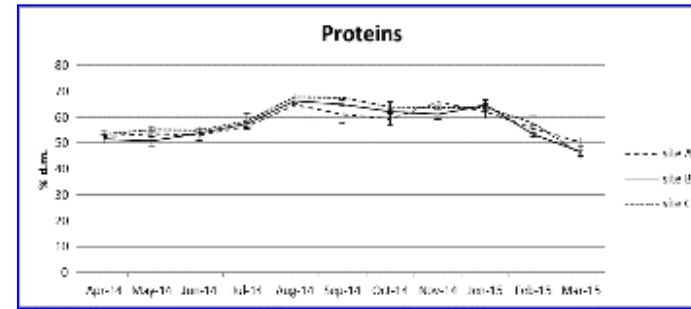
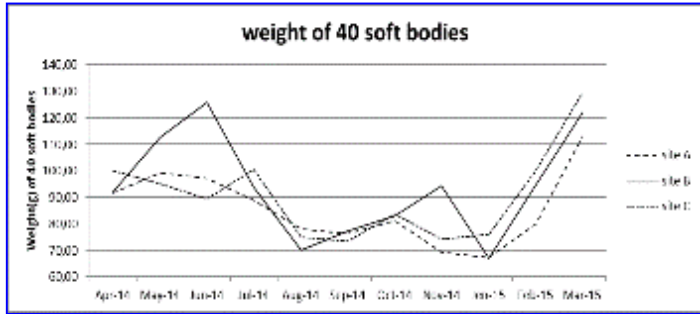
FOLIN-CIOCALTEU

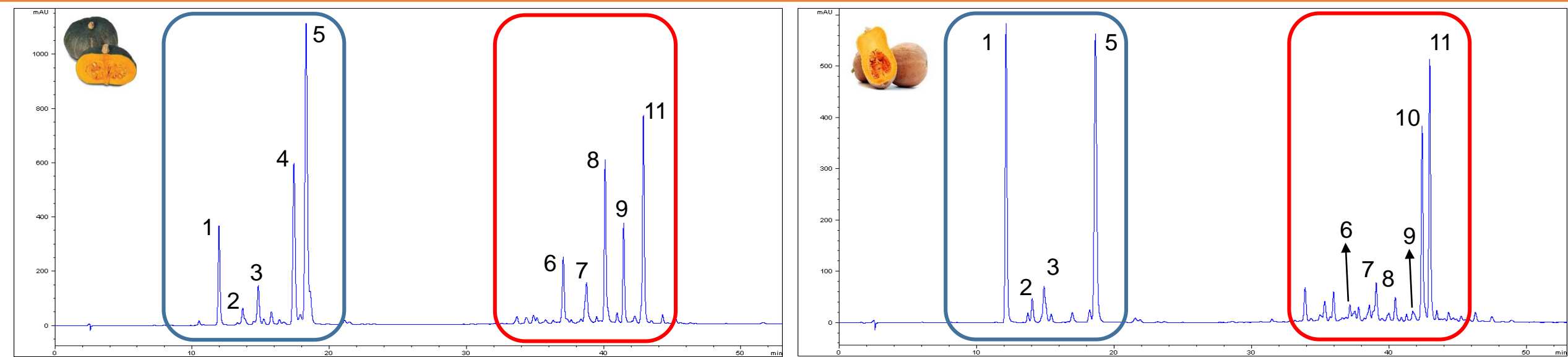


ACIDO CLOROGENICO - HPLC



SEASONAL VARIATION IN WEIGHT AND BIOCHEMICAL COMPOSITION OF TAPES PHILIPPINARUM IN A NORTH ADRIATIC COASTAL LAGOON (SACCA DI GORO, ITALY)

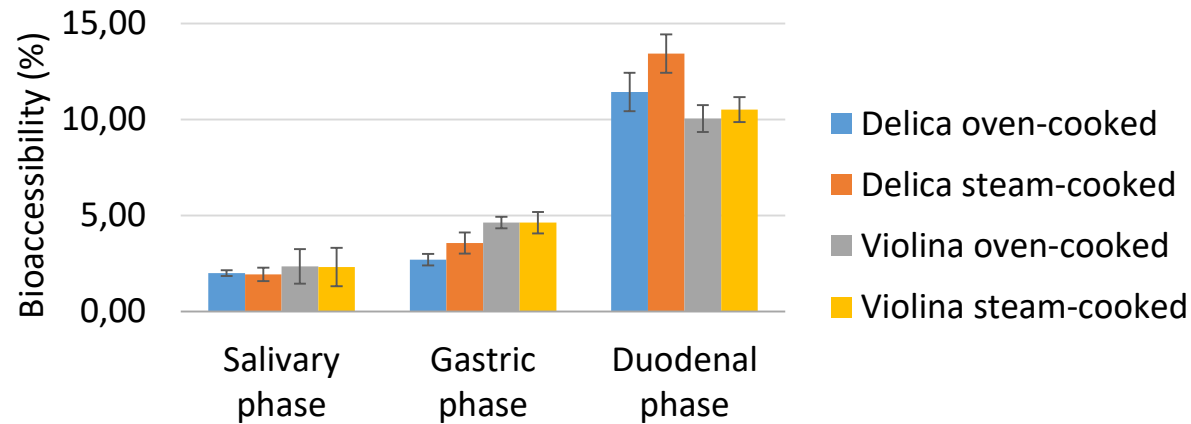




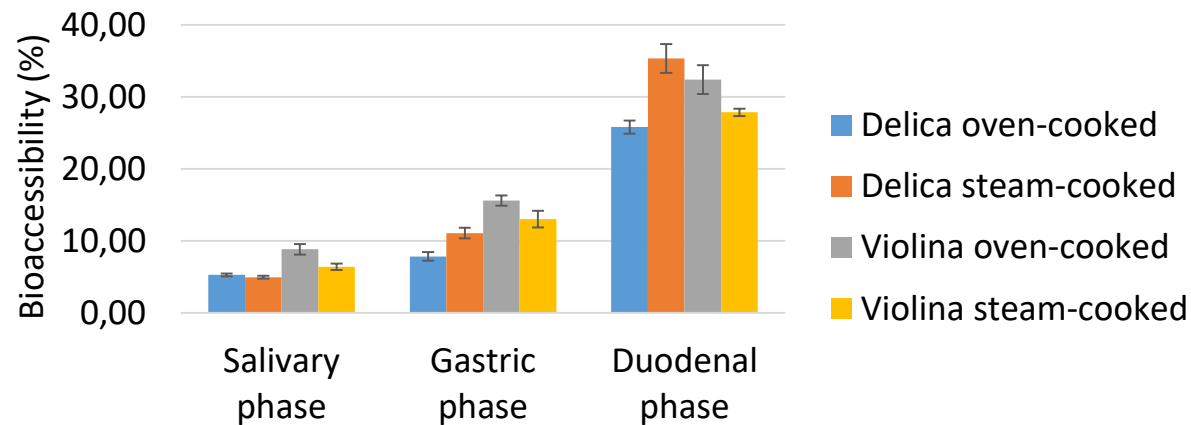
		Absolute quantification in fresh raw pumpkins	
Peak		<i>C. maxima</i> (Delica)	<i>C. moschata</i> (Violina)
Xanthophylls	violaxanthin	9,09±0,99	10,53±0,96
	astaxanthin	2,54±0,39	1,18±0,06
	anteraxanthin	4,34±0,74	1,73±0,14
	zeaxanthin	16,99±3,08	nd
	lutein	37,12±3,08	10,30±1,01
Carotenes	lycopene	19,25±2,69	6,44±0,24
	7	17,79±2,42	7,55±0,30
	8	38,73±6,09	6,89±0,4
	9	23,66±3,28	6,39±0,61
	α-carotene	nd	17,56±2,26
	β-carotene	49,29±3,78	26,22±2,23

BIOACCESSIBILITY OF CAROTENOIDS

Bioaccessibility of lutein



Bioaccessibility of β -carotene

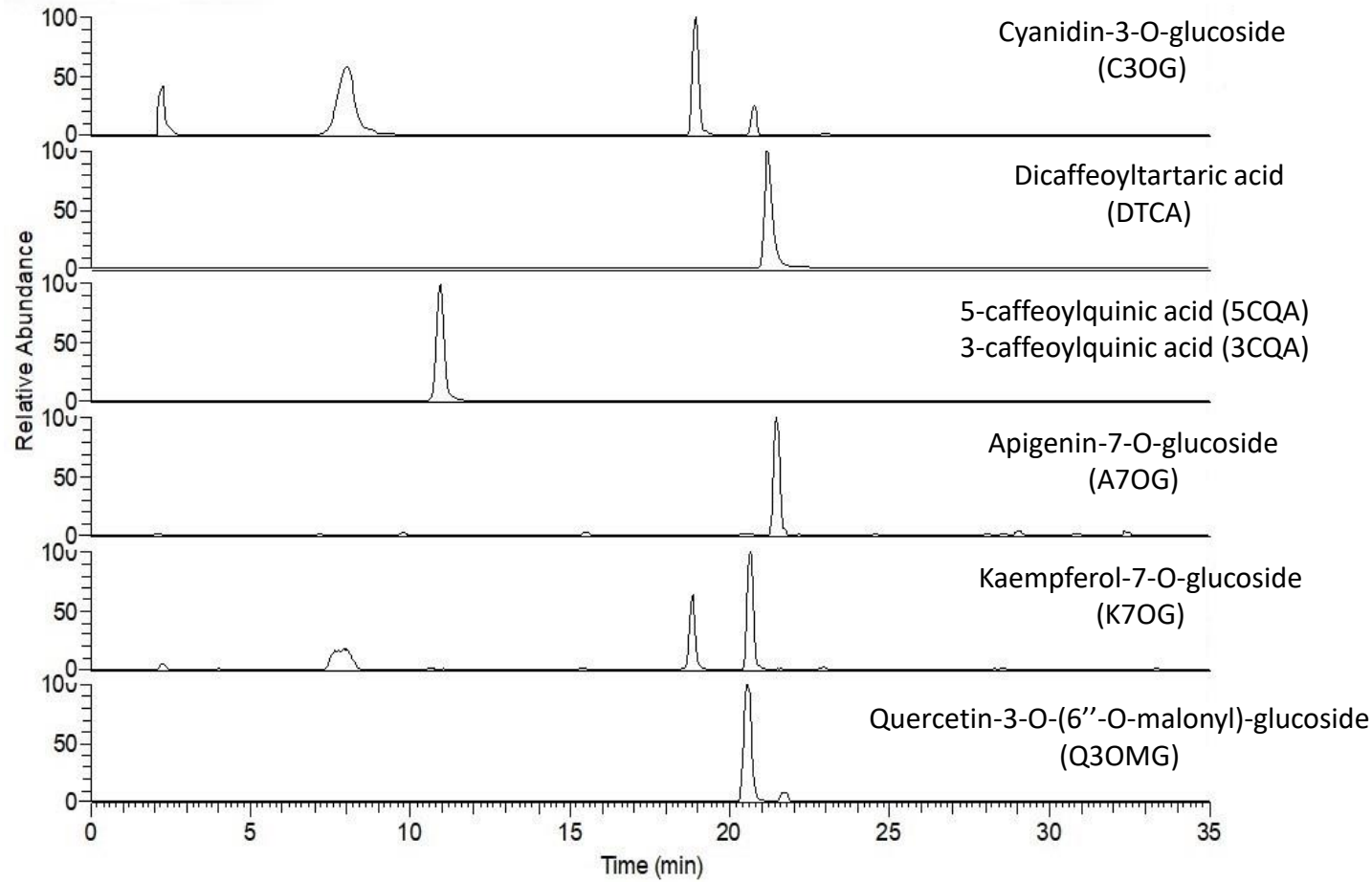


Bioaccessibility values increase from the salivary to the duodenal phase

	Delica oven-cooked	Delica steam-cooked	Violina oven-cooked	Violina steam-cooked
Salivary phase	1,99±0,15	1,93±0,35	2,34±0,90	2,31±1,00
Gastric phase	2,70±0,30	3,57±0,55	4,63±0,30	4,62±0,55
Duodenal phase	11,43±1,00	13,42±1,00	10,04±0,70	10,51±0,65

	Delica oven-cooked	Delica steam-cooked	Violina oven-cooked	Violina steam-cooked
Salivary phase	5,29±0,19	4,94±0,18	8,83±0,75	6,40±0,45
Gastric phase	7,83±0,60	11,09±0,75	15,60±0,70	13,03±1,17
Duodenal phase	25,81±0,88	35,32±1,97	32,41±2,00	27,85±0,50

Bioaccessibility of lutein is always lower than that of β -carotene

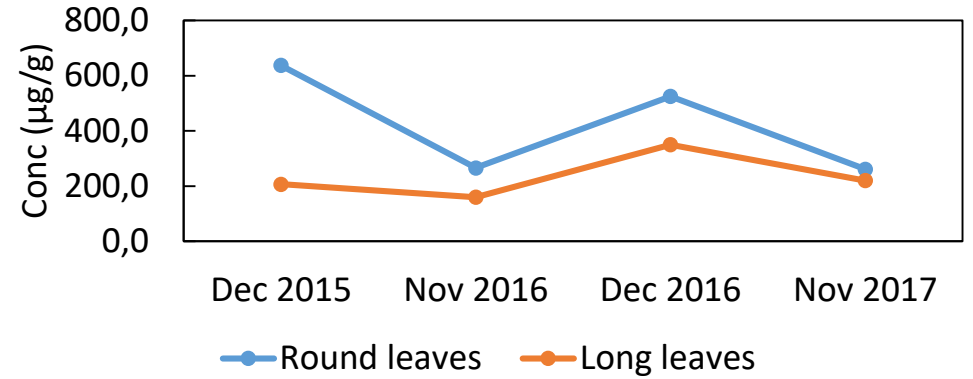


Seasonal variability of polyphenols

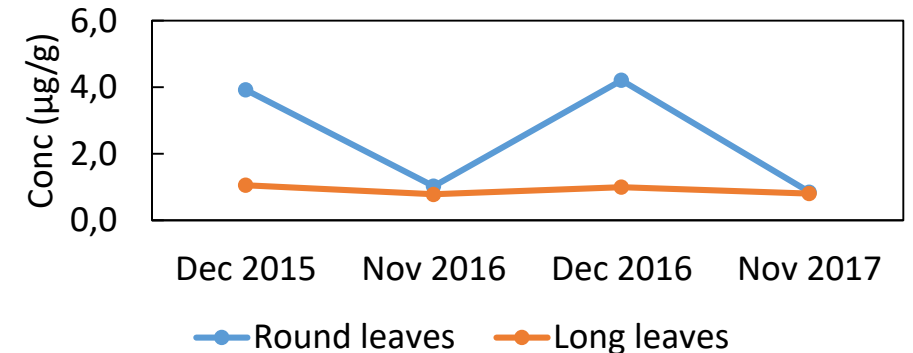
Maximum concentrations in the coldest months
 Minimum concentrations in the mildest months



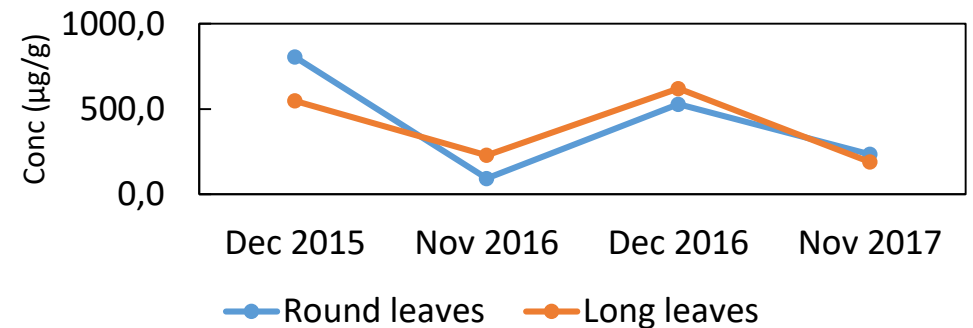
3-Caffeoylquinic acid



5-Caffeoylquinic acid



Dicafeoyltartaric acid



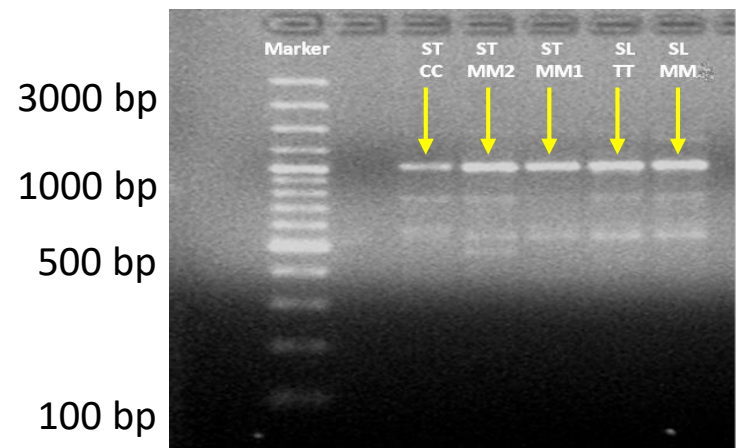
Genomic DNA extraction
and clean-up

- Phenol and chloroform
- The quality of the DNA evaluated by means of ratio of absorbance at 260 and 280 nm
- The quality of genomic DNA was further checked by subjecting it to agarose gel electrophoresis

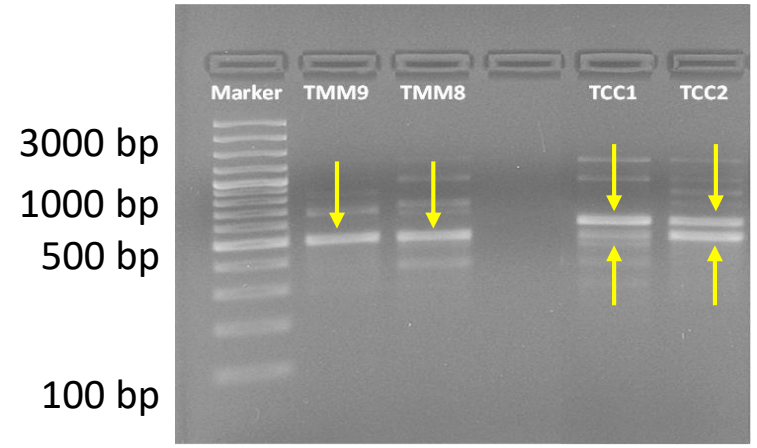
DNA amplification
and DNA detection

- RAPD with 10 random primers (10-mer)
- Amplified samples were loaded in agarose gel 2%
- Analysis by electrophoresis

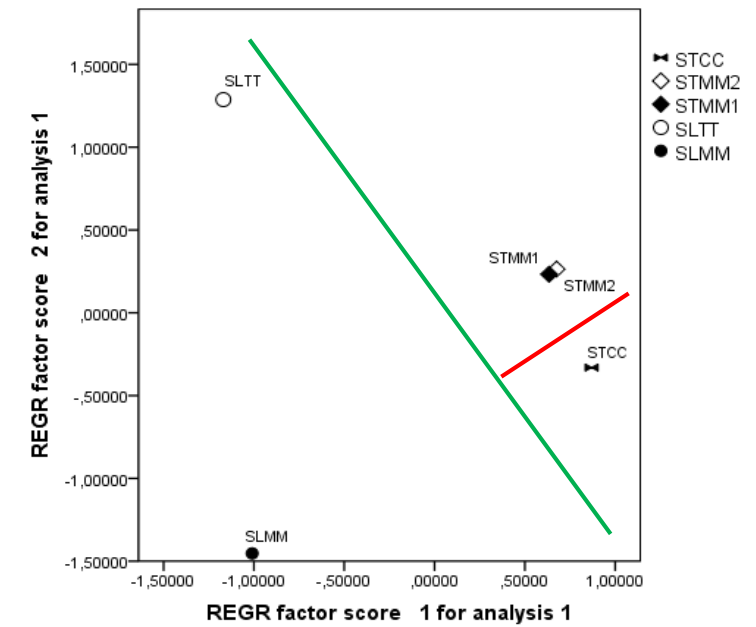
Primer	Sequence (5'-3')
OPB-05	TGCGCCCTTC
OPB-10	CTGCTGGGAC
OPD-08	GTGTGCCCCA
OPH-03	AGACGTCCAC
OPM-02	ACAACGCCTC
OPM-03	GGGGGATGAG
OPM-13	GGTGGTCAAG
OPO-10	TCAGAGCGCC
OPU-18	GAGGTCCACA
OPV-19	GGGTGTGCAG



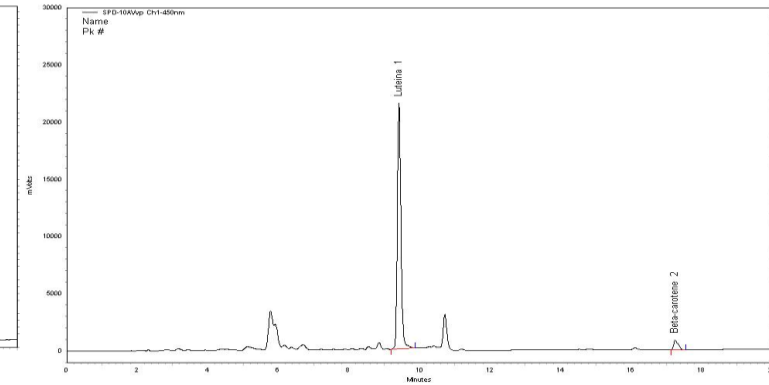
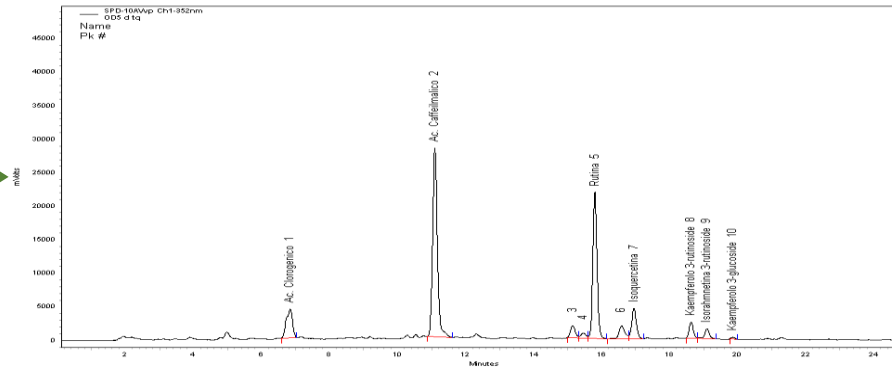
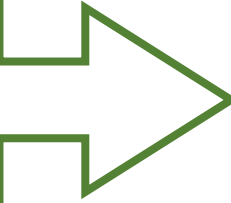
RAPD patterns obtained with primer OPH-03 on DNA extracted from red chicory seeds



RAPD patterns obtained with primer OPV-19 on DNA extracted from red chicory round leaves



STUDIO DI PRODOTTI CON FINALITA' NUTRACEUTICHE: L'ORTICA

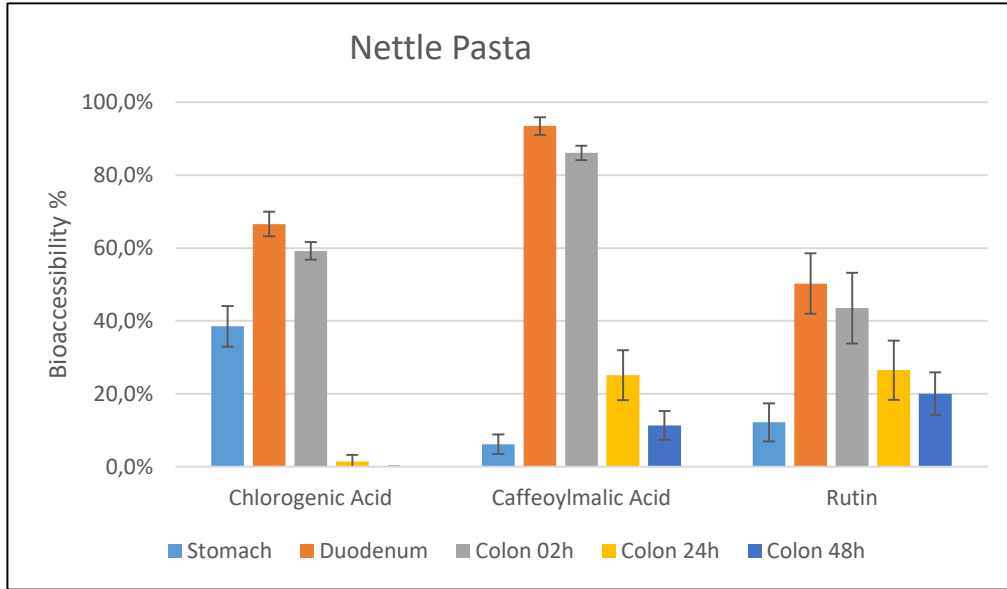


Effect of Cooking

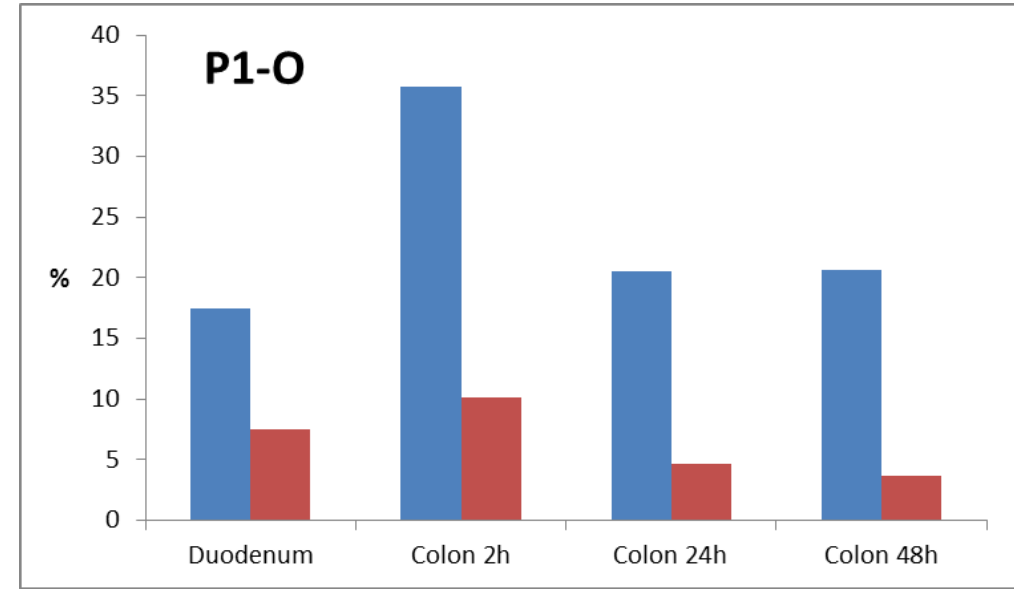
	Uncooked Pasta				Cooked Pasta				Loss %		Uncooked Pasta	Cooked Pasta	Loss %
	Solubile	Bound	Total	% Bound	Solubile	Bound	Total	% Bound					
Chlorogenic Ac.	139,1	85,4	224,6	38,0	91,3	91,7	183,0	50,1	18,5	Lutein	8,26	6,59	20,21
Caffeoylmalic Ac.	203,1	64,6	267,7	24,1	97,9	74,6	172,5	43,2	35,6	β-Carotene	1,59	1,29	18,87
Rutin	141,3	11,6	152,9	7,6	73,9	13,4	87,3	15,3	42,9				

Effect of cooking process on the phenolic content of sample P1-O, egg pasta enriched with Nettle. Content expressed in µg/g of dry sample (mean, N = 4).

Bioaccessibility



Bioaccessibility % (mean \pm ds, N=4) of Chlorogenic Ac., Caffeoylmalic Ac. and Rutin in nettle-based foods.



Bioaccessibility % of Lutein and β -carotene in nettle-based foods.

TRASFORMAZIONE DI SCARTI DI LAVORAZIONE DELL'ASPARAGO

Prodotto	Fibra (%s.s)	Fibra Solubile (%s.s)	Fibra Insolubile (%s.s)	Rapporto Fibra solubile/insolubile		WAI g acqua/g s.s. ±ds	OAI g olio/g s.s. ±ds	SV mL/g s.s.±ds
Asparago Sostanza secca	50,53±1,44	5,82±0,20	44,71±1,64	0,130	Asparago Sostanza secca	3,67±0,08	2,17±0,04	5,92±0,07
Asparago Estratto fibroso	85,16±0,31	7,92±0,22	77,25±0,09	0,103	Asparago Estratto fibroso	10,63±0,36	7,14±0,04	15,63±0,14
Avena	93,15	2,16	90,97	0,024	Avena	4,59±0,09	3,69±0,09	9,5±0,3
Bamboo	97,98	0,00	97,98	0,000	Bamboo	4,37±0,08	4,62±0,03	9,1±0,1
Patata	65,34	7,73	57,72	0,134	Patata	3,71±0,09	2,00±0,04	5,7±0,1
Piselli	72,15	1,66	70,44	0,024	Piselli	6,8±0,02	2,02±0,01	15,9±0,2
Mela	58,82	12,20	46,62	0,262	Mela	3,20±0,07	1,47±0,04	7,0 ±0,1
Grano	97,63	0,78	96,86	0,008	Grano	5,3±0,1	4,38±0,05	12,9±0,2

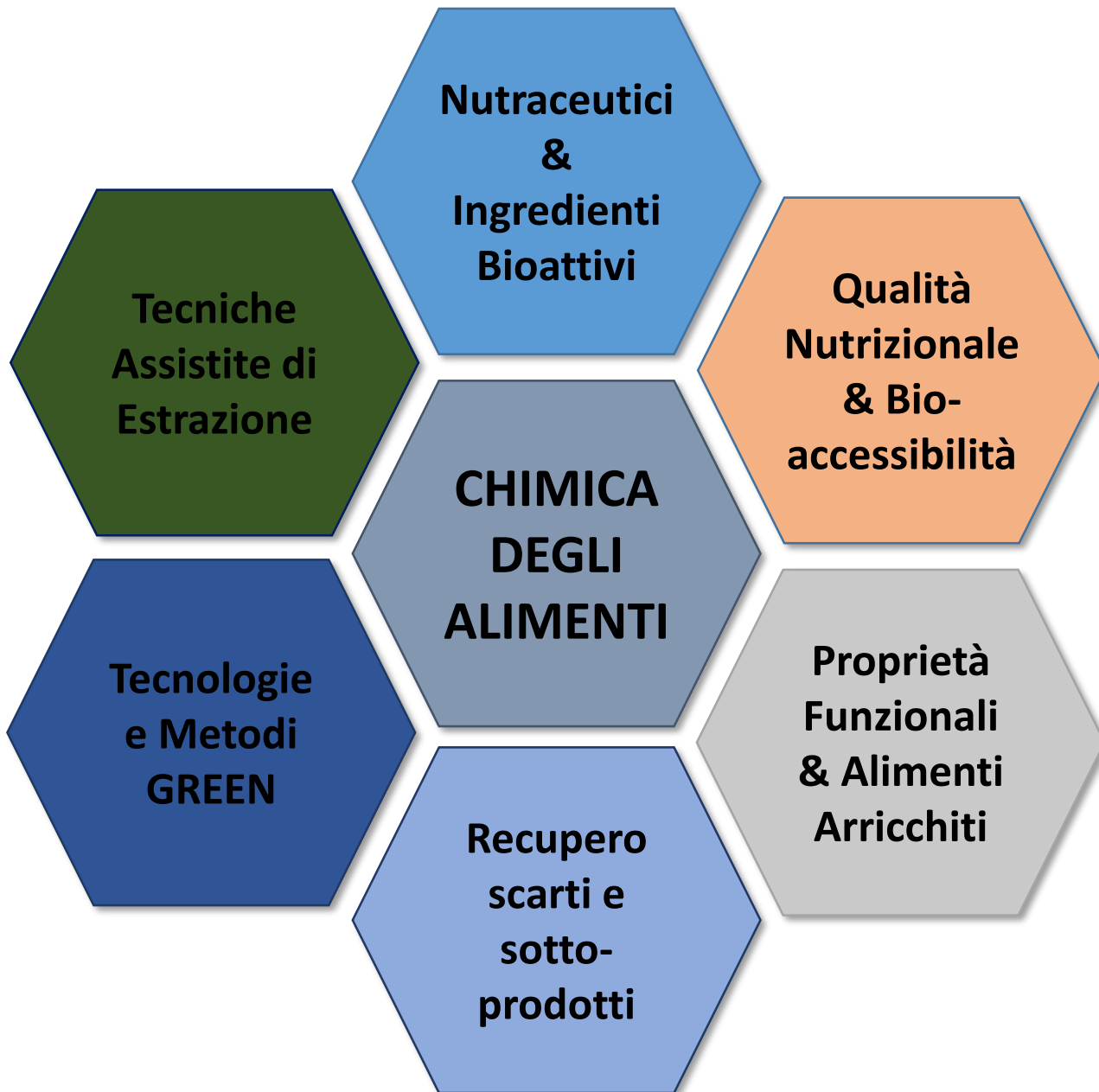
	Sostanza secca	Sostanza secca fermentata	Concentrato fibroso	Concentrato fibroso fermentato
Fibra totale	50,53±1,44	59,99±1,09	85,16±0,31	81,30±2,92
Fibra solubile	5,82±0,20	8,05±1,21	7,92±0,22	11,99±0,78
Fibra insolubile	44,71±1,64	51,94±2,30	77,25±0,09	69,31±3,71
solubile /insolubile	0,130	0,154	0,103	0,173



+30%

Valori letteratura fibre commerciali

WAI= capacità assorbimento acqua
OAI= capacità assorbimento olio
SV= volume rigonfiamento



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Farmaceutiche ed Agrarie**

**GRAZIE PER
L'ATTENZIONE**