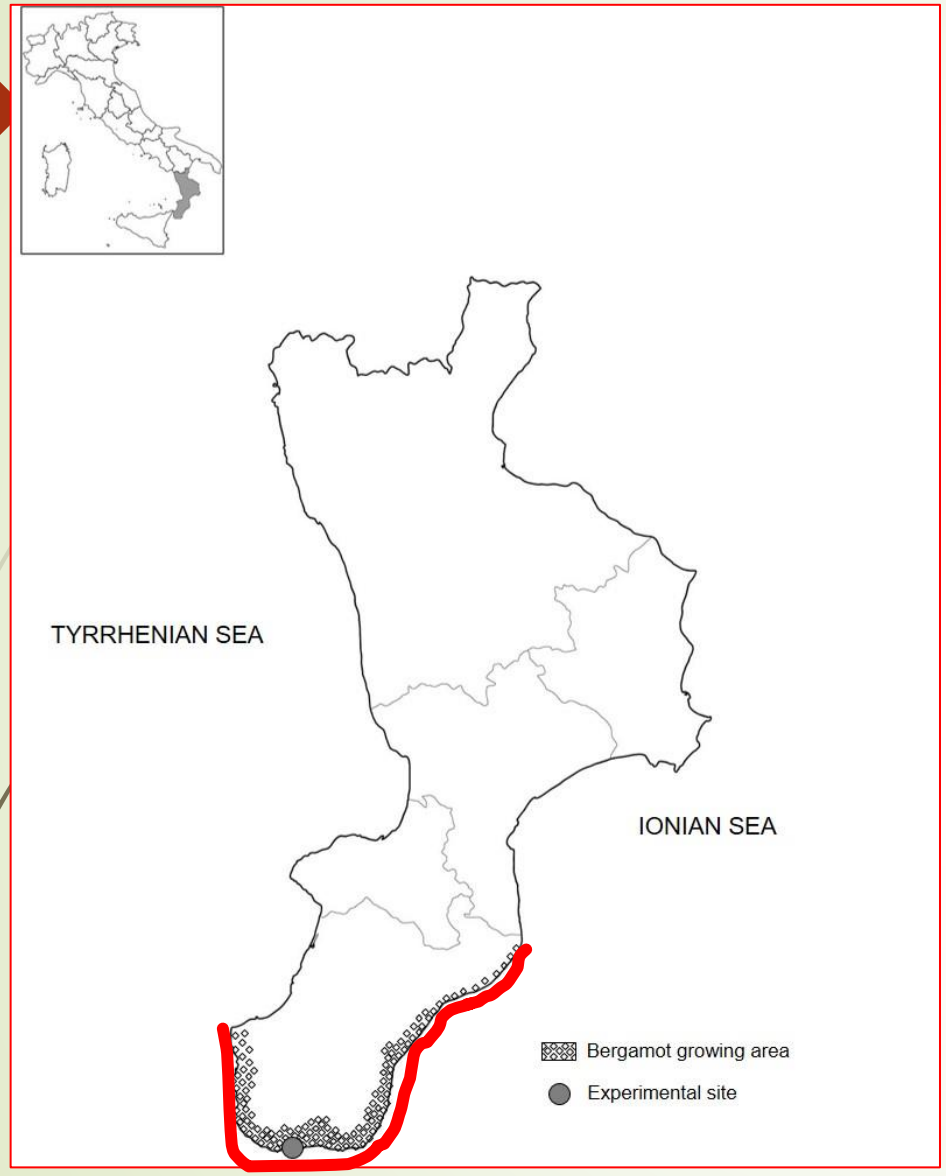
Alla scoperta del bergamotto, l'agrume che profuma il mondo

Marco Poiana
Università Mediterranea di Reggio Calabria

"Bergamotto di Reggio Calabria: tra identità locale e attrattività turistica"

Reggio Calabria 6 ottobre 2024



Area vocata alla coltivazione del bergamotto:

Parte di fascia costiera della provincia di Reggio Calabria

Il mio profumo è come un mattino italiano di primavera dopo la pioggia: ricorda le arance, i limoni, i pompelmi, i bergamotti, i cedri, i fiori e le erbe aromatiche della mia terra.

Mi rinfresca e stimola sensi e fantasia.

(Giovanni Maria Farina, 1708)

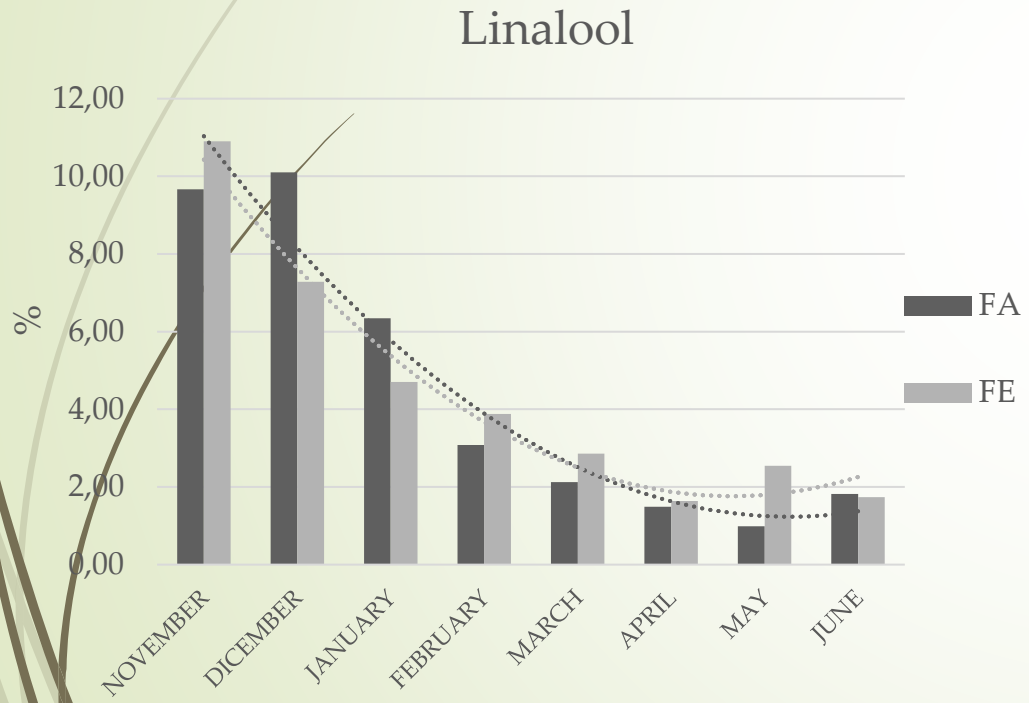
CARATTERISTICHE OLIO ESSENZIALE

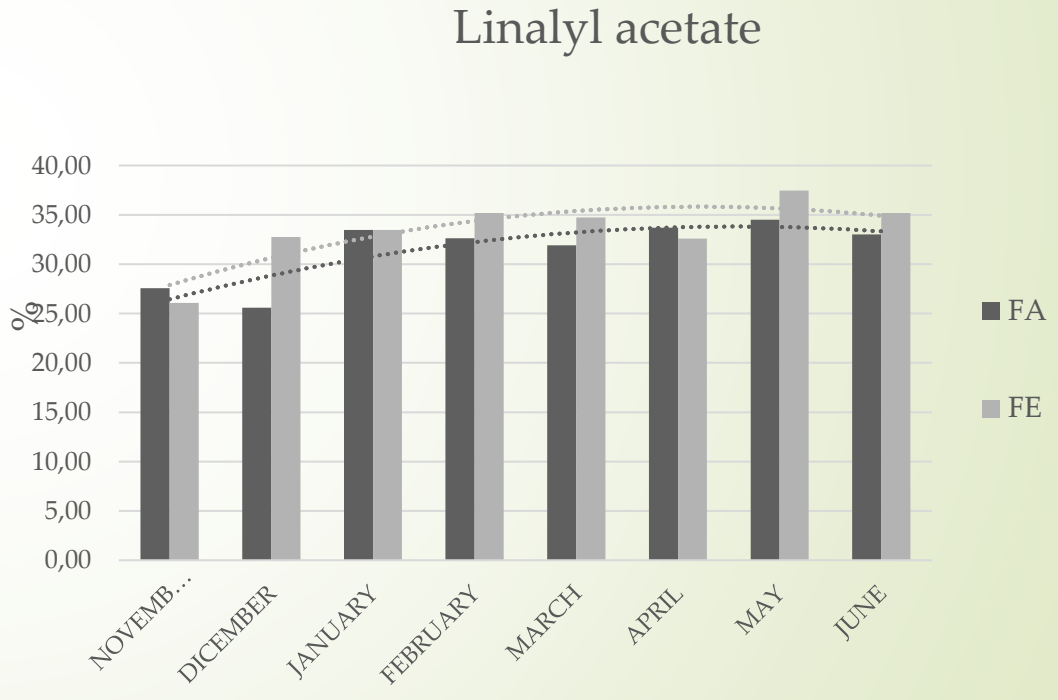
Component	Minimum %	Maximum %
β-Pinene	4,0	8,5
Limonene	32,0	47,0
γ-Terpinene	6,0	10,0
Linalool	3,0	15,0
Linalyl acetate	22,0	36,0
Geranial	0,25	0,5
β-Bisabolene	0,3	0,7

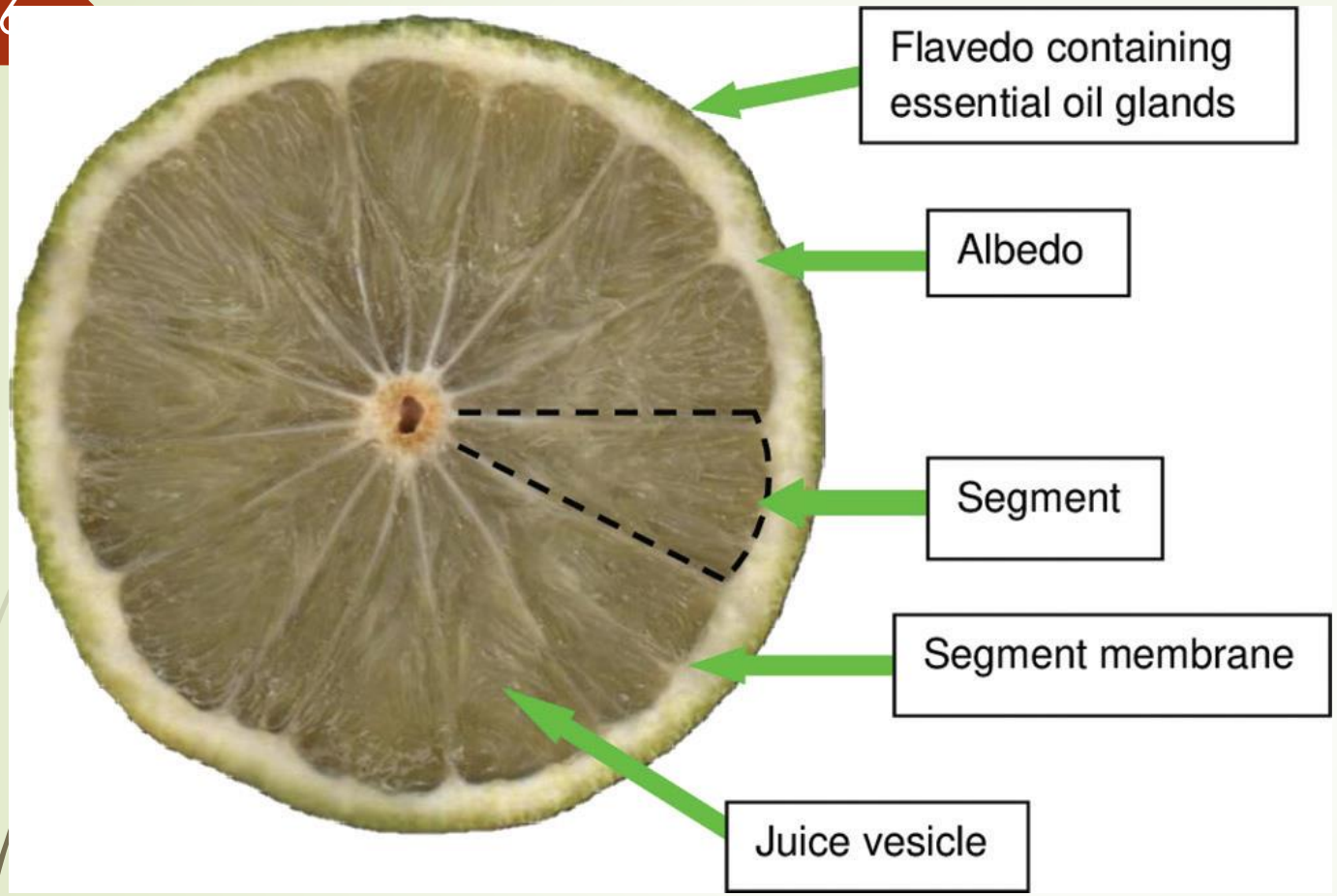
Influenzate da
- Areale di produzione
- Andamento stagionale
- Epoca di raccolta

Norma ISO 3520 (Essential oil of bergamot [Citrus bergamia Risso et Poit], Calabrian type)

VARIAZIONE DURANTE MATURAZIONE DELLA COMPOSIZIONE IN LINALOLO E LINALIL ACETATO DI OLI ESSENZIALI DI BERGAMOTTO PRODOTTO NELL'AREALE TIPICO
In annata normale







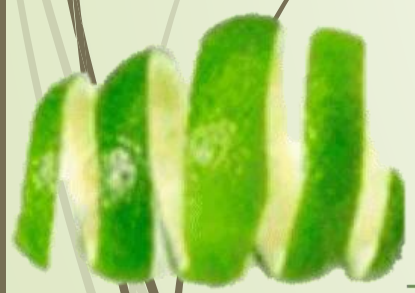
Il frutto di bergamotto

Olio essenziale: 0,5 %
Succo: 35-55 %
Parti solide residue (pastazzo): 45-65%

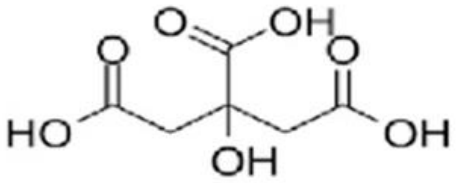
Utilizzo della sola essenza → INSOSTENIBILE

Industria di trasformazione del Bergamotto

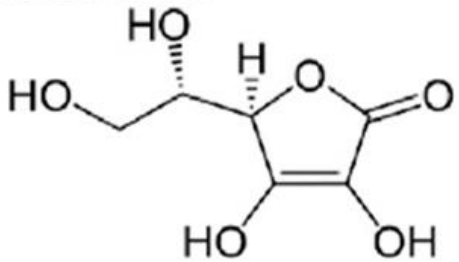
Il frutto di bergamotto è una sorprendente fonte di composti



Organic acids

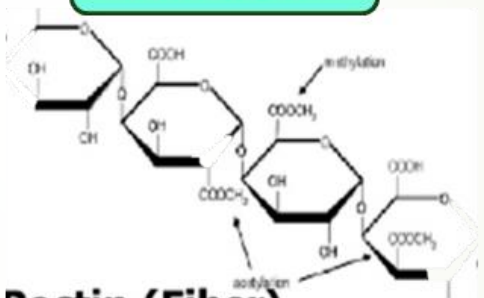


Citric acid

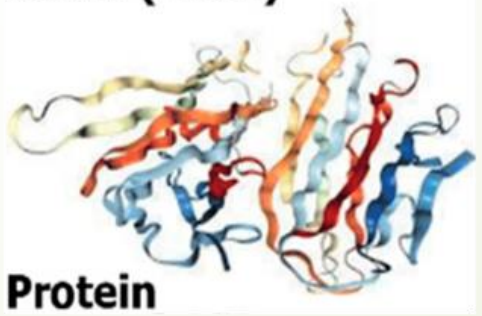


Ascorbic acid

Nutrients

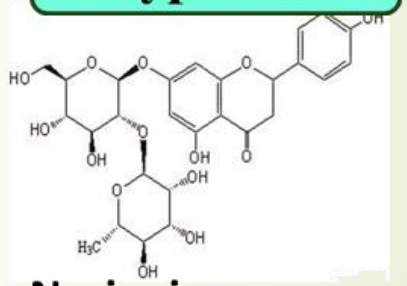


Pectin (Fiber)

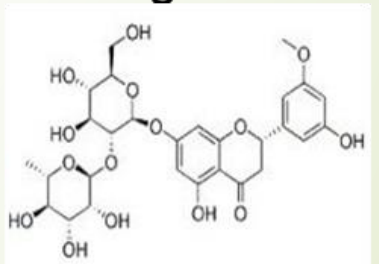


Protein

Polyphenols

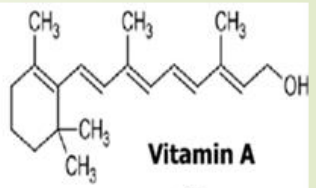


Naringin

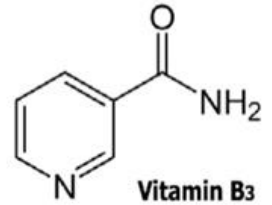


Neohesperidin

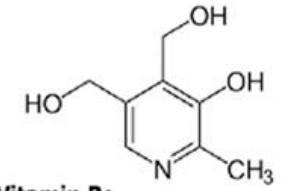
Vitamins



Vitamin A



Vitamin B3



Vitamin B6

Emirates Journal of Food and Agriculture. 2020. 32(11): 835-845
doi: 10.97 35/ejfa.2020.v32.i11.2197
http://ww.w.ejfa.me/

REVIEW ARTICLE

The peel essential oil composition of bergamot fruit (*Citrus bergamia*, Risso) of Reggio Calabria (Italy): a review

Giuseppina Gioffrè, Domenica Ursino, Maria Laura Concetta Labate, Angelo Maria Giuffrè*

Dipartimento di AGRARIA. Università degli Studi Mediterranea di Reggio Calabria (Italy). Contrada Melissari, 89124 (Reggio Calabria), Italia

Emirates Journal of Food and Agriculture. 2020. 32(7): 522-532
doi: 10.9755/ejfa.2020.v32.i7.2128
http://www.ejfa.me/

RESEARCH ARTICLE

Citrus bergamia, Risso: the peel, the juice and the seed oil of the bergamot fruit of Reggio Calabria (South Italy)

Giuffrè Angelo Maria[1]*, Nobile Riccardo[2]

[1]Dipartimento di AGRARIA. Università degli Studi 'Mediterranea' di Reggio Calabria, Italy. Contrada Melissari, 89124, Reggio Calabria, Italy,
[2]Herbal & Antioxidant Derivatives s.r.l (H&AD), Bianco, Reggio Calabria

antioxidants

MDPI

Article

Bergamot (*Citrus bergamia*, Risso): The Effects of Cultivar and Harvest Date on Functional Properties of Juice and Cloudy Juice

Angelo Maria Giuffrè

Università degli Studi Mediterranea di Reggio Calabria, AGRARIA—Dipartimento di Agricoltura, Risorse forestali, Ambiente Risorse zootecniche, Ingegneria agraria, Alimenti—Contrada Melissari, 89124 Reggio Calabria, Italy; amgiuffre@unirc.it

European Food Research and Technology (2020) 246:1991–2005
https://doi.org/10.1007/s00217-020-03550-8

ORIGINAL PAPER

Check for updates

Differences in the composition of phenolic compounds, carotenoids, and volatiles between juice and pomace of four citrus fruits from Southern Italy

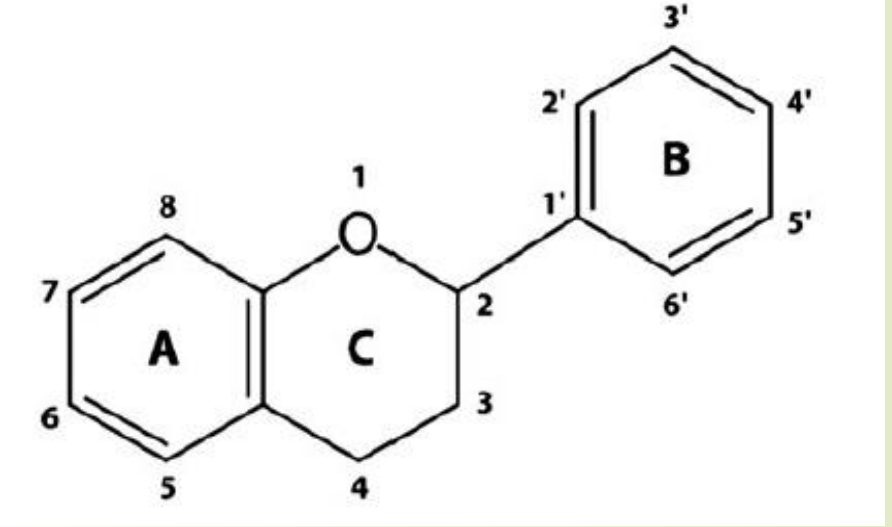
Salvatore Multari[1] · Silvia Carlin[1] · Vincenzo Sicari[2] · Stefan Martens[1]

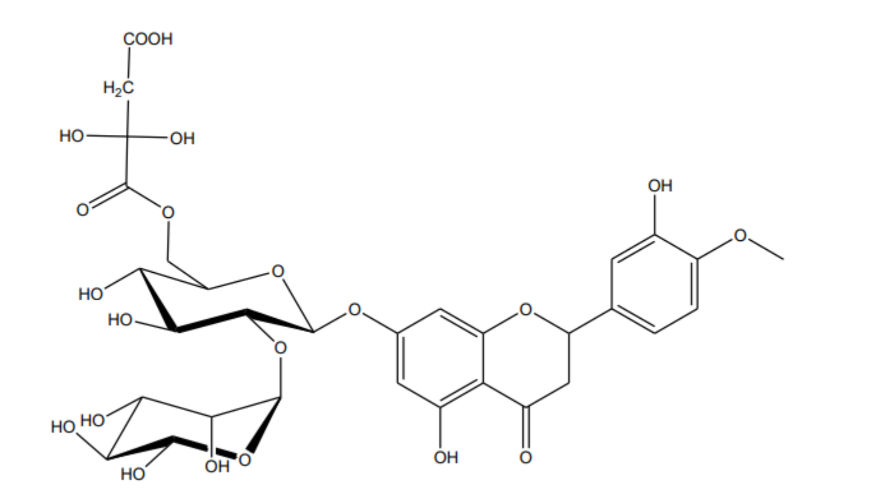
Composti Nutraceutici in Agrumi

Flavonoidi

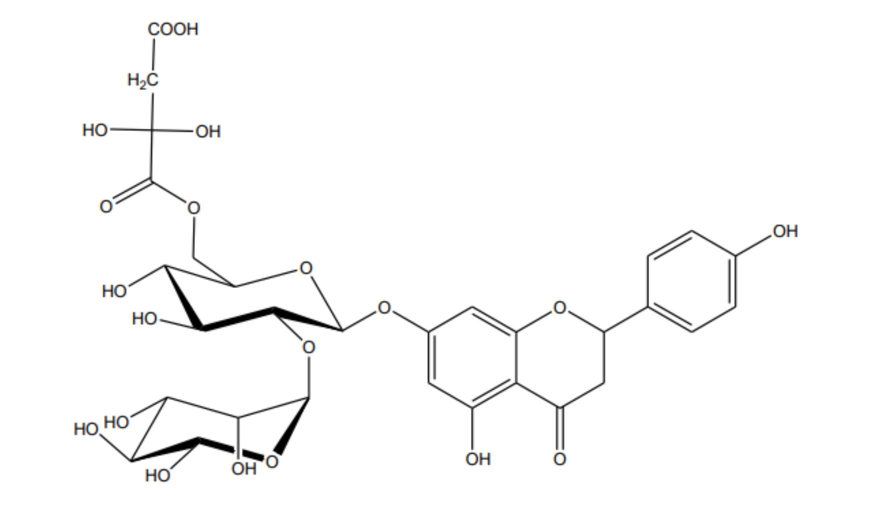
Appartengono alla categoria dei polifenoli

Possiedono proprietà biochimiche di interesse funzionale nel campo nutrizionale e terapeutico. Considerati composti nutraceutici.





brutieridina



melitidina

Bergamotto di Reggio Calabria

foods

MDPI

Article

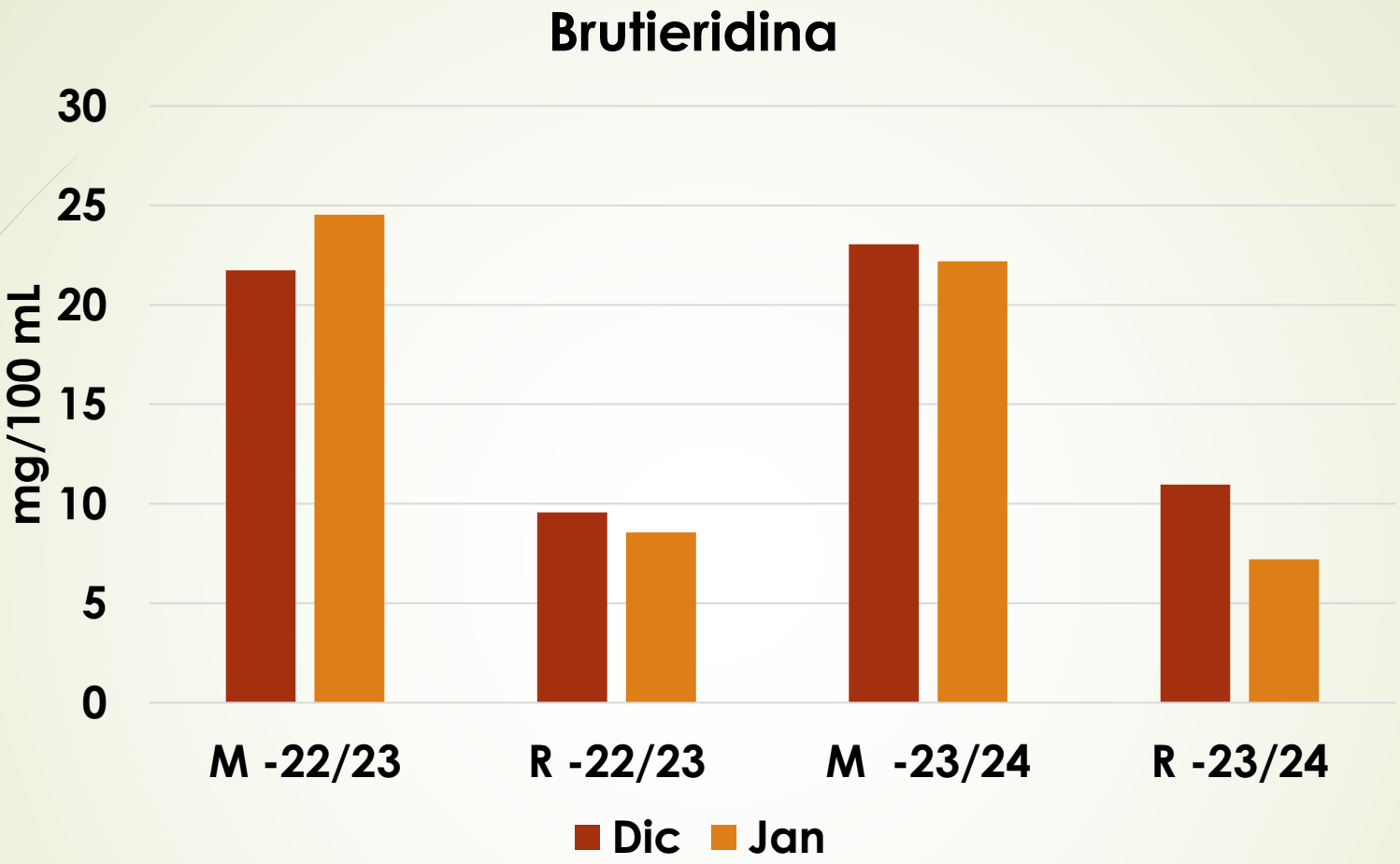
Quality Evaluation of Bergamot Juice Produced in Different Areas of Calabria Region

Antonio Gattuso [1,2], Rocco Mafrica [1], Serafino Cannavò [1], Davide Mafrica [1], Alessandra De Bruno [3,*] and Marco Poiana [1]

1 Department of AGRARIA, University Mediterranea of Reggio Calabria, 89124 Reggio Calabria, Italy; antonio.gattuso@unirc.it (A.G.); rocco.mafrica@unirc.it (R.M.); serafino.cannavo@unirc.it (S.C.); davidemafrica68@gmail.com (D.M.); mpoiana@unirc.it (M.P.)

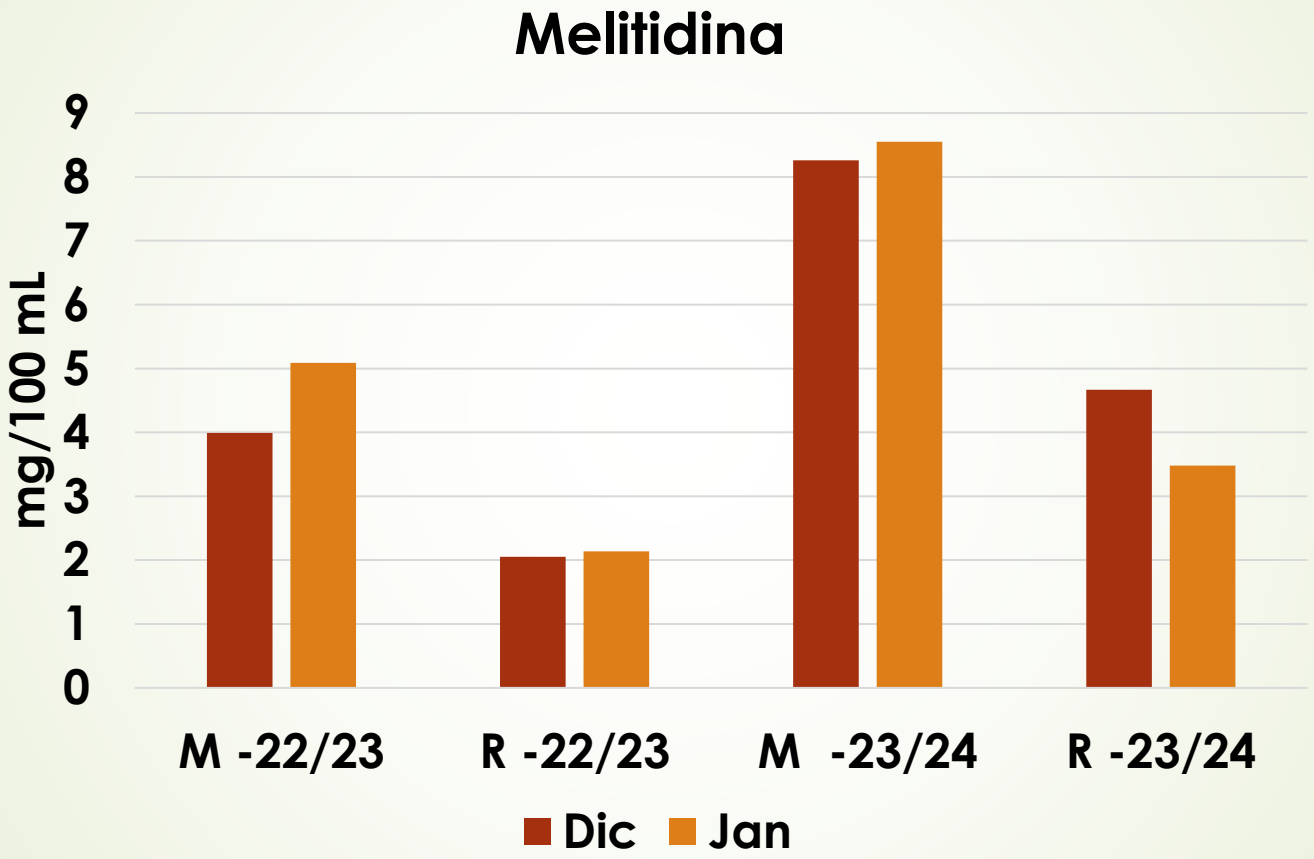
2 Experimental Station for the Industry of the Essential Oils and Citrus Products SSEA, 89127 Reggio Calabria, Italy

3 Department of Human Sciences and Promotion of the Quality of Life, San Raffaele University, 00166 Rome, Italy



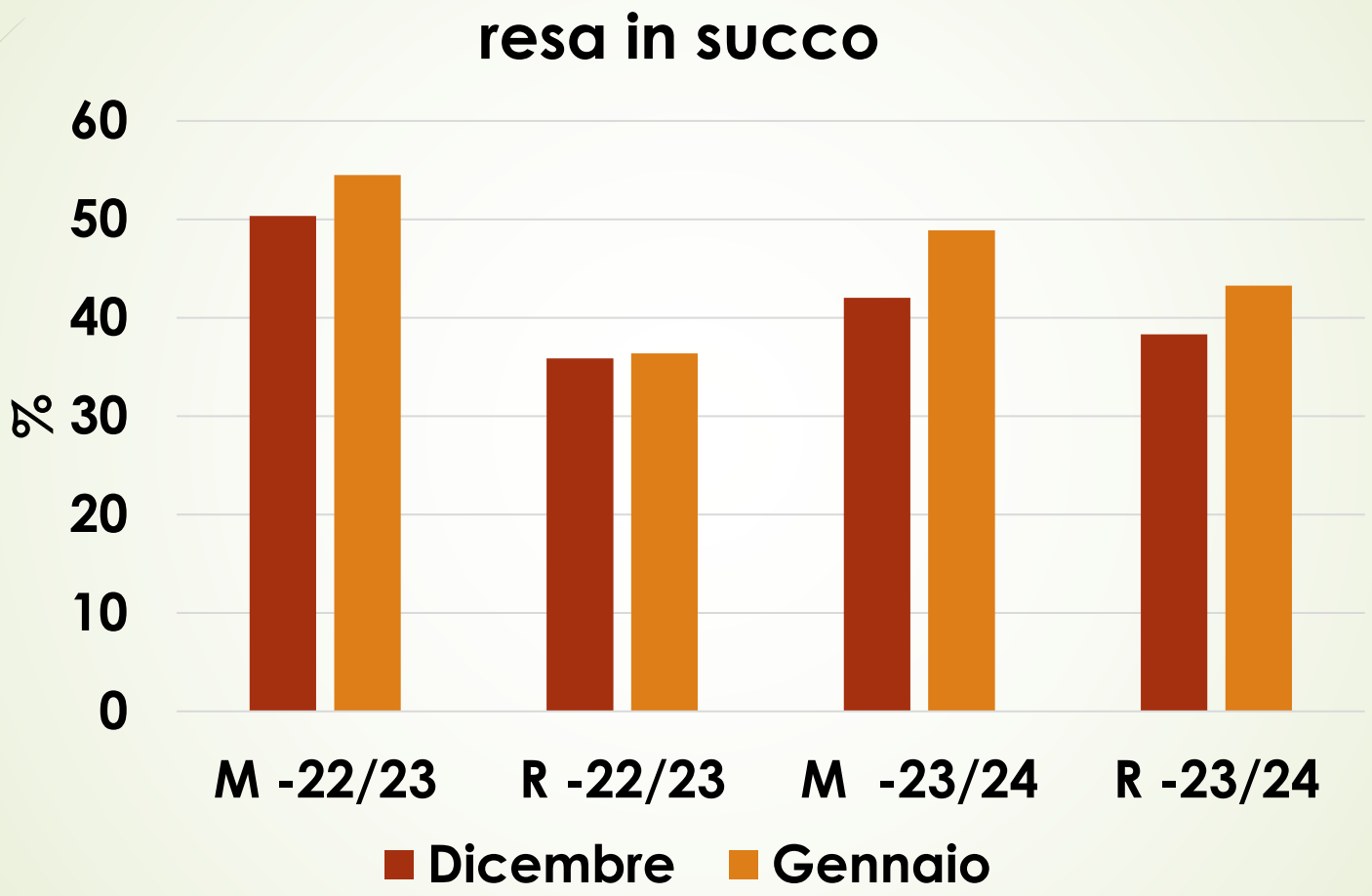
M : Melito PS

R: Rizziconi



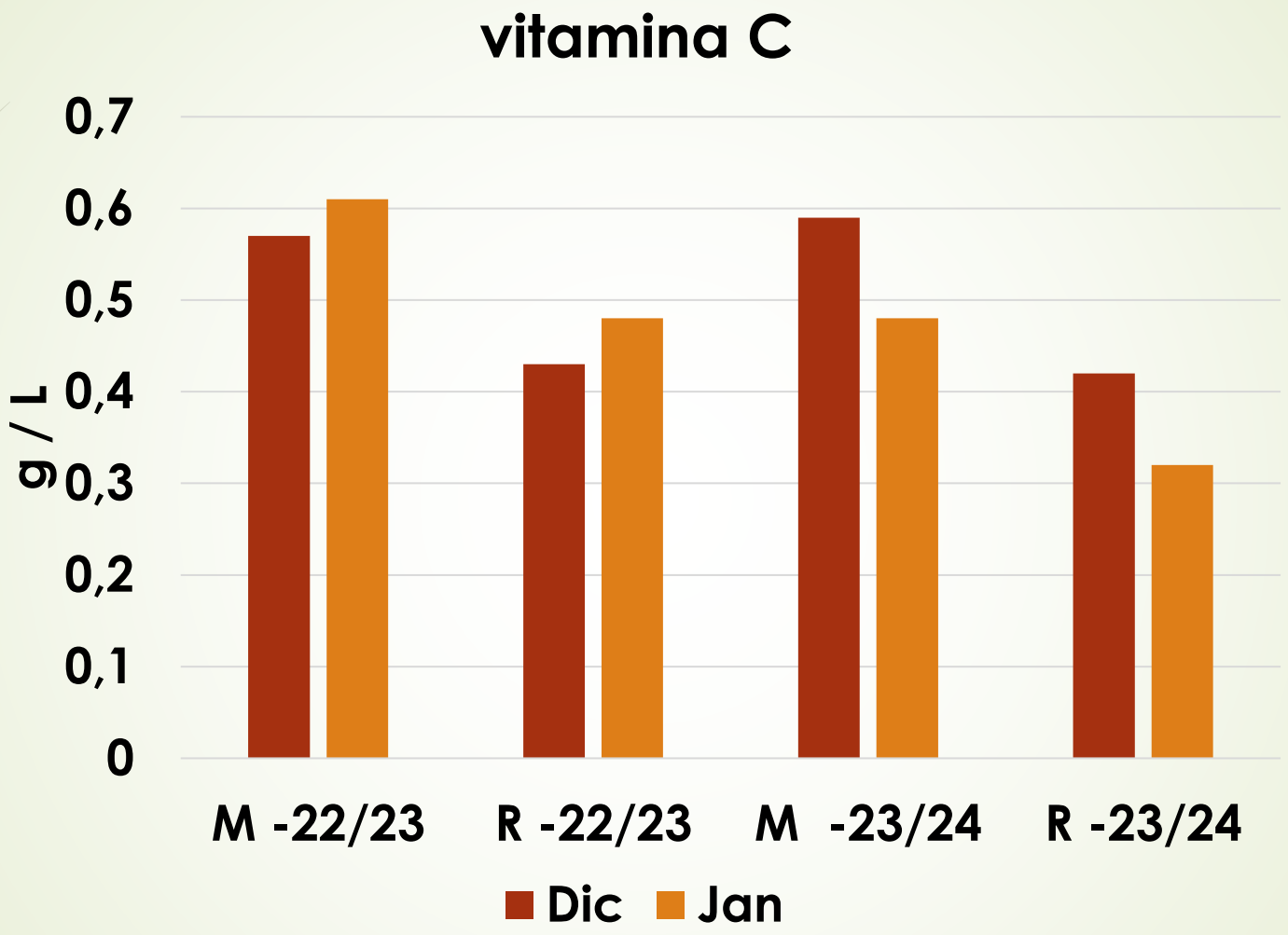
M : Melito PS

R: Rizziconi



M : Melito PS

R: Rizziconi



M : Melito PS

R: Rizziconi

SOTTOPRODOTTI LAVORAZIONE BERGAMOTTO

SOTTOPRODOTTI POSSONO ESSERE CONSIDERATI UN PROBLEMA DA RISOLVERE DAL PUNTO DI VISTA:

- AMBIENTALE;
- ECONOMICO;
-GESTIONE DEL PROCESSO.

DA PROBLEMA

POSSONO ESSERE CONSIDERATI

UNA FONTE DI COMPOSTI BIOLOGICAMENTE ATTIVI;

UN SOSTITUTO O UN INGREDIENTE DOI PREPARAZIONI (ALIMENTARI);

ALTRO…

A RISORSA!!!!

foods

MDPI

Article

Formulation of Biscuits Fortified with a Flour Obtained from Bergamot By-Products (*Citrus bergamia*, Risso)

Valeria Laganà, Angelo Maria Giuffrè *, Alessandra De Bruno and Marco Poiana

Department of AGRARIA, University Mediterranea of Reggio Calabria, 89124 Reggio Calabria, Italy; valerialagana.foodtec@gmail.com (V.L.); alessandra.debruno@unirc.it (A.D.B.); mpoiana@unirc.it (M.P.)

Applicazione degli antiossidanti naturali: Biscotti funzionali

Pastazzo essiccato e macinato

Samples	Hardness Value (g)	Sensory Overall Acceptability (SOA)
C	1823.15 [a]	6.45 [b]
$BPF_{2.5}$	2021.95 [b]	7.15 [a]
BPF_5	2637.45 [c]	5.85 [c]
BPF_{10}	2717.22 [c]	4.05 [d]
BPF_{15}	2817.57 [c]	3.45 [e]

Valutare la corretta quantita' di pastazzo disidratato e macinato addizionato alla formulazione

sustainability

MDPI

Article

Bergamot Pomace Flour: From Byproduct to Bioactive Ingredient for Pasta Production

Antonio Gattuso [1,2], Alessandra De Bruno [3,*], Amalia Piscopo [1], Simone Santacaterina [1], Maria Josè Frutos [4] and Marco Poiana [1]

1 Department of Agraria, University Mediterranea of Reggio Calabria, 89124 Reggio Calabria, Italy; antonio.gattuso@unirc.it (A.G.); amalia.piscopo@unirc.it (A.P.); simone.santacaterina@unirc.it (S.S.); mpoiana@unirc.it (M.P.)

2 Experimental Station for the Industry of the Essential Oils and Citrus Products SSEA, 89127 Reggio Calabria, Italy

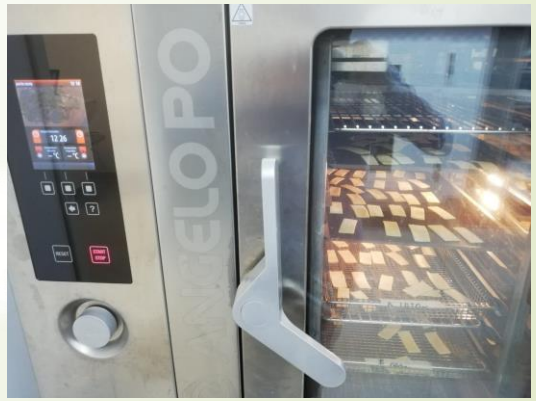
3 Department of Human Sciences and Promotion of the Quality of Life, San Raffaele University, 00185 Rome, Italy

4 Agro-Food Technology Department, Centro de Investigación e Innovación Agroalimentaria y Agroambiental (CIAGRO), Miguel Hernández University, 03312 Orihuela, Spain; mj.frutos@umh.es

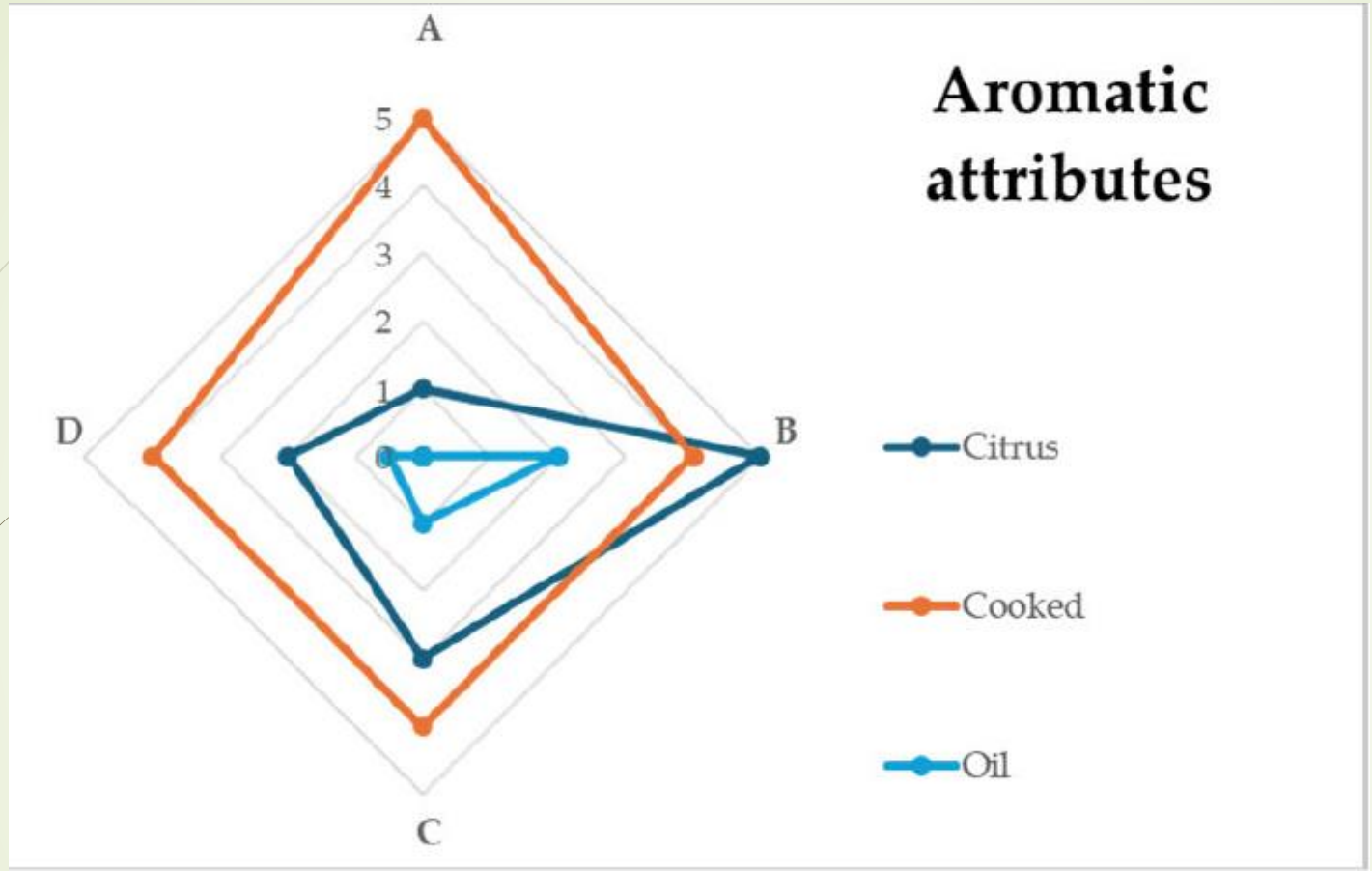
Formulazione di pasta con parti di farina di pastazzo di bergamotto

Bergamot by-product flour

Fresh pasta



Dried pasta



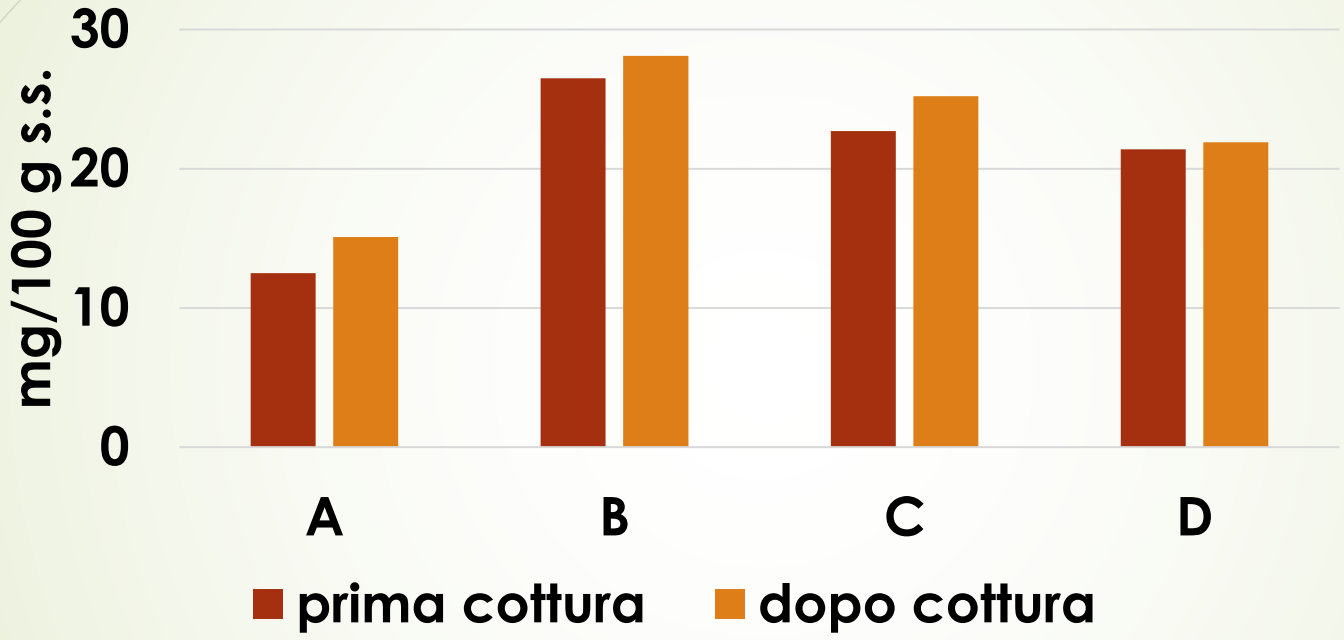
A: 0 % Farina pastazzo bergamotto

B: 5 % FPB

C: 2,5 % FPB

D: 1,5 % FPB

Flavonoidi in pasta addizionata di farina di bergamotto



A: 0 % Farina pastazzo bergamotto

B: 5 % FPB

C: 2,5 % FPB

D: 1,5 % FPB

agriculture

MDPI

Article

Recovery of Bioactive Compounds from Calabrian Bergamot Citrus Waste: Selection of Best Green Extraction

Antonio Gattuso [1,2], Amalia Piscopo [1], Rosa Romeo [1], Alessandra De Bruno [1,*] and Marco Poiana [1]

[1] Department of AGRARIA, University Mediterranea of Reggio Calabria, 89124 Reggio Calabria, Italy; antonio.gattuso@unirc.it (A.G.); amalia.piscopo@unirc.it (A.P.); rosa.romeo@unirc.it (R.R.); mpoiana@unirc.it (M.P.)

[2] Experimental Station for the Industry of the Essential Oils and Citrus Products SSEA, 89127 Reggio Calabria, Italy

Valorizzazione e sostenibilità: recupero sottoprodotti

Recupero antiossidanti naturali

Estratto di Bergamotto

DESOLVENTED EXTRACT

pH	° Brix
3,26 ± 0,04	15,9 ± 0,28

TPC (mg GAE L^{-1})	TFC (mg CE L^{-1})	ABTS (mmolTrolox L^{-1})	DPPH (mmolTrolox L^{-1})
4238,39 ± 171,88	1073 ± 30,94	806,2 ± 10,85	343,97 ± 35,05

mg L^{-1}	ac. P-cum	Eriocitrin	Neoeriocitrin	Narirutin	Naringin	Neohesperidin	Melitidin	Brutieridin
	34,79 ± 3,68	28,91 ± 6,27	2075,36 ± 172,16	8,61 ± 1,42	2347,79 ± 227,5	692,22 ± 62,41	252,33 ± 35,07	740,39 ± 94,25

foods

MDPI

Artide

Effect of Edible Coating Enriched with Natural Antioxidant Extract and Bergamot Essential Oil on the Shelf Life of Strawberries

Alessandra De Bruno [1], Antonio Gattuso [1,2], Davide Ritorto [1], Amalia Piscopo [1] and Marco Poiana [1,*]

[1] Department of AGRARIA, University Mediterranea of Reggio Calabria, 89124 Reggio Calabria, Italy
[2] Experimental Station for the Industry of the Essential Oils and Citrus Products SSEA, 89127 Reggio Calabria, Italy

Fresh strawberries
(cv. Camarosa)

Dipping formulation

- Gum arabic was dissolved in distilled water
- Addition of antioxidant solutions
- Heating at 40°C for one hour under magnetic stirrer

Fruit Immersion

Strawberries were dipped in each coating solutions for 3 min and the excess of coating was drained and air dried (UV)

Packaged and stored

The fruits were packaged into hinged food containers (PET), and stored at 4°C (90% of humidity) for 14 days

Accettabilità al consumo superiore a 8 giorni di conservazione

Sustainable Food Technology

ROYAL SOCIETY OF CHEMISTRY

PAPER

View Article Online
View Journal | View Issue

Check for updates

Cite this: *Sustainable Food Technol.*, 2023, 1, 951

Fortification of vegetable fat with natural antioxidants recovered by bergamot pomace for use as an ingredient for the production of biscuits

Antonio Gattuso, [ab] Amalia Piscopo, [a] Simone Santacaterina,[a] Elisa Imeneo,[a] Alessandra De Bruno [*c] and Marco Poiana[a]

European Food Research and Technology (2020) 246:1981–1990
https://doi.org/10.1007/s00217-020-03549-1

ORIGINAL PAPER

Vinegar production from *Citrus bergamia* by-products and preservation of bioactive compounds

Leonardo Di Donna[1] · Lucia Bartella[1] · Luciana De Vero[2] · Maria Gullo[2] · Angelo M. Giuffrè[3] · Clotilde Zappia[3] · Marco Capocasale[3] · Marco Poiana[3] · Silvia D'Urso[3] · Andrea Caridi[3]

In conclusione

Il bergamotto non è solo olio essenziale

Dal frutto intero possono essere ricavati altri prodotti

Dai sottoprodotti possono essere ricavate sostanze attive biologicamente da utilizzare per la formulazione di alimenti funzionali

Bergamotto diviene maggiormente sostenibile

Può essere parte integrante di una identità territoriale

Ma … si devono conoscere gli effetti con altri ingredienti e con i processi applicati