

efficacia e sicurezza a confronto: il caso Bergamotto



Prof. Michele Navarra
Università di Messina
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Citrus bergamia Risso & Poiteau

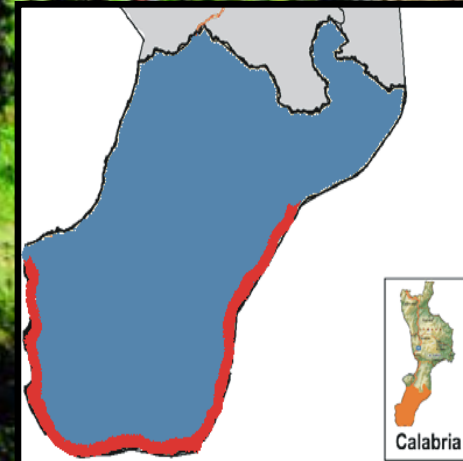
Famiglia: **Rutaceae**

Sub-famiglia: **Mesperidee**

Genere: **Citrus**

Olio Essenziale di Bergamotto: **industria profumiera**

Succo di Bergamotto: **prodotto secondario**





Pollistena

Palmi

Taurianova

Cittanova

Siderno

Locri

Villa San Giovanni

Messina

Reggio di Calabria

Marina di Palmi

REVIEW

Anti-infective potential of *Citrus bergamia* Risso et Poiteau (bergamot) derivatives: a systematic review

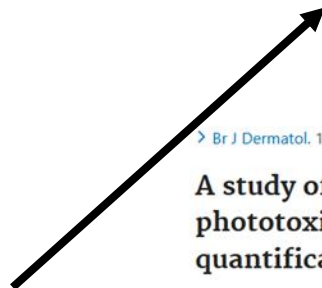
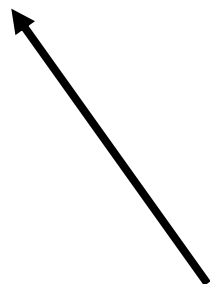
Santa Cirmi, Carlo Bisignano, Giuseppina Mandalari and Michele Navarra*

Department of Chemical, Biological, Pharmaceutical and Environmental Sciences, University of Messina, I-98168, Messina, Italy



FOTOTOSSICITA' DEL BEO

creme abbronzanti → **induttore della melanogenesi**



fototossicità in diversi modelli *in vitro* ed *in vivo*

> Br J Dermatol. 1977 May;96(5):475-82. doi: 10.1111/j.1365-2133.1977.tb07149.x

A study of oil of bergamot and its importance as a phototoxic agent. I. Characterization and quantification of the photoactive component

S T Zaynoun, B E Johnson, W Frain-Bell

PMID: 871382 DOI: 10.1111/j.1365-2133.1977.tb07149.x

FULL TEXT LINKS

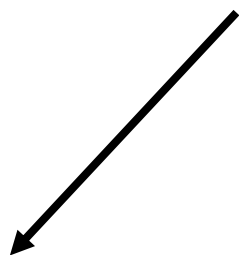
WILEY Full Text Article

ACTIONS

“ Cite

☆ Favorites

bergaptene



nell'uomo...



Journal of Photochemistry and Photobiology B:
Biology

Volume 7, Issues 2-4, November 1990, Pages 231-250



Phototumorigenesis studies of 5-methoxypsoralen in bergamot oil: Evaluation and modification of risk of human use in an albino mouse skin model

Antony R. Young, Susan L. Walker, Judith S. Kinley, Stephen R. Plastow, Dietrich Averbeck, Patrice Morlière¹, Louis Dubertret¹

PUVA terapia (combinazione di psoraleni e radiazioni UVA)



trattamento di psoriasi e vitiligine

Trial of Essential Oils to Improve Sleep for Patients in Cardiac Rehabilitation

Brenda McDonnell, BSN, RN, CCAP-I, PCCN-K,^{1,*} and Patricia Newcomb, PhD, RN, CPNP²

Randomized Controlled Trial > J Altern Complement Med. 2018 Jul;24(7):717-724.

doi: 10.1089/acm.2017.0320. Epub 2018 Mar 22.

Effectiveness of Aromatherapy Massage and Inhalation on Symptoms of Depression in Chinese Community-Dwelling Older Adults

Mei Xiong¹, Yanzhang Li¹, Ping Tang¹, Yuping Zhang¹, Min Cao¹, Junwei Ni¹,
Menamena Xina¹

Phytother. Res. 31: 27–39 (2017)
Published online 17 October 2016 in Wiley Online Library
(wileyonlinelibrary.com) DOI: 10.1002/ptr.5734

REVIEW

Clinical Pharmacology of *Citrus bergamia*: A Systematic Review

Carmen Mannucci,¹ Michele Navarra,² Fabrizio Calapai,¹ Raffaele Squeri,¹
Sebastiano Gangemi³ and Gioacchino Calapai^{1,*}

¹Department of Biomedical and Dental Sciences and Morphofunctional Imaging, University of Messina, Messina, Italy

²Department of Chemical, Biological, Pharmaceutical and Environmental Sciences, University of Messina, Messina, Italy

³Department of Clinical and Experimental Medicine, University of Messina, Messina, Italy

PROFILO FARMACO- TOSSICOLOGICO DEL BEO

frontiers in
PHARMACOLOGY

MINI REVIEW ARTICLE
published: 02 March 2015
doi: 10.3389/fphar.2015.00036



Citrus bergamia essential oil: from basic research to clinical application

Michele Navarra^{1*}, Carmen Mannucci², Marisa Delbò³ and Gioacchino Calapai²

¹ Department of Drug Sciences and Products for Health, University of Messina, Messina, Italy

² Department of Clinical and Experimental Medicine, University of Messina, Messina, Italy

³ Italian Medicines Agency, Rome, Italy

458 *Brief reports*

J AM ACAD DERMATOL
SEPTEMBER 2001

Accidental bullous phototoxic reactions to bergamot aromatherapy oil

Steven Kaddu, MD, Helmut Kerl, MD, and Peter Wolf, MD *Graz, Austria*

LA NANOMEDICINA PER RIDURRE LA FOTOTOSSICITA' DEL BEO

> [Expert Opin Drug Deliv.](#) 2021 Jan;18(1):139-150. doi: 10.1080/17425247.2021.1844180.
Epub 2020 Nov 11.


Bergamot oil as an integral component of nanostructured lipid carriers and a photosensitizer for photodynamic treatment of vitiligo: Characterization and clinical experimentation

Mai Shaaban ¹, Maha Nasr ², Abeer A Tawfik ², Maha Fadel ³, Omaira Sammour ¹

Drug Delivery and Translational Research (2019) 9:1106–1116
<https://doi.org/10.1007/s13346-019-00653-y>

ORIGINAL ARTICLE

Novel bergamot oil nanospanlastics combined with PUVB therapy as a clinically translatable approach for vitiligo treatment

Mai Shaaban ¹ • Maha Nasr ¹  • Abeer Attia Tawfik ² • Maha Fadel ³ • Omaira Sammour ¹

FULL TEXT LINKS



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SHARE



COMPOSIZIONE del BEO

il **BEO** contiene circa 350 composti



frazione volatile (93-96 %)

limonene

linalolo

linalile acetato

α - e β -pinene

β -mircene

γ -terpinene

sabinene

β -bisabolene

geraniale

neril acetato

geranil acetato

frazione non volatile (4 -7 %)

psoraleni

coumarine polimetossilati

flavoni

cere

Research Article

Flavour and
Fragrance Journal

Received: 27 March 2009;

Revised: 31 August 2009;

Accepted: 5 September 2009;

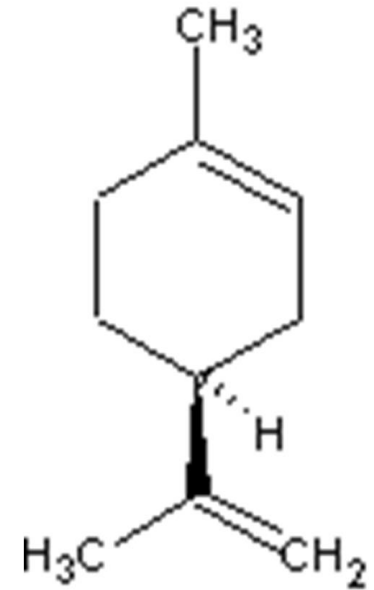
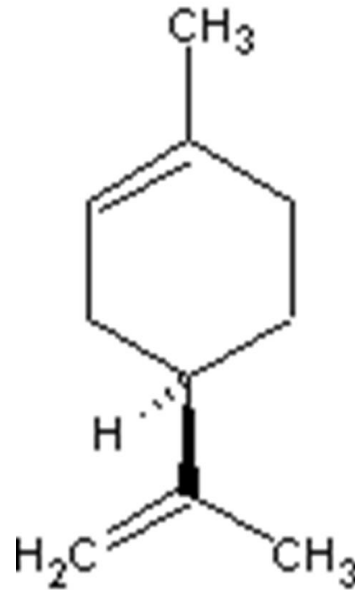
Published online in Wiley InterScience: 6 October 2009

(www.interscience.wiley.com) DOI 10.1002/ffj.1949

Study on the chemical composition variability of some processed bergamot (*Citrus bergamia*) essential oils

Rosaria Costa,^a Paola Dugo,^a Michele Navarra,^b Vilfredo Raymo,^c Giovanni Dugo^a and Luigi Mondello^{a,d*}

limonene



monoterpene

- ✓ proprietà corroboranti e stomachiche
- ✓ potere insetticida ed antiparassitario
- ✓ spiccate proprietà antiossidanti ed antinfiammatorie
- ✓ ... antibatteriche
- ✓ ... immunostimolanti
- ✓ favorisce la detossificazione dei cancerogeni

effetto antidepressivo del limonene

Phytomedicine 83 (2021) 153474



Contents lists available at [ScienceDirect](#)

Phytomedicine

journal homepage: www.elsevier.com/locate/phymed



Original Article

Limonene has anti-anxiety activity via adenosine A2A receptor-mediated regulation of dopaminergic and GABAergic neuronal function in the striatum



Complementary Therapies in Clinical Practice 39 (2020) 101153

Yunjeong Song^{a,1}, Sowoon Seo^{a,1}, Santosh Lamichhane^b, Hye Jin Cha^{c,*}, Jaesuk Yun^{a,*}



Contents lists available at [ScienceDirect](#)

Complementary Therapies in Clinical Practice

journal homepage: <http://www.elsevier.com/locate/ctcp>



The effect of bergamot orange essence on anxiety, salivary cortisol, and alpha amylase in patients prior to laparoscopic cholecystectomy: A controlled trial study



Nilofar Pasyar^{a,b}, Masoume Rambod^{a,*}, Fatemeh Araghi^c

PHYTOTHERAPY RESEARCH
Phytother. Res. 31: 812–816 (2017)
Published online 24 March 2017 in Wiley Online Library
(wileyonlinelibrary.com) DOI: 10.1002/ptr.5806

Bergamot (*Citrus bergamia*) Essential Oil Inhalation Improves Positive Feelings in the Waiting Room of a Mental Health Treatment Center: A Pilot Study

Xuesheng Han,^{1,*} Jacob Gibson,² Dennis L. Eggett³ and Tory L. Parker¹

¹doTERRA International, LLC, 389 South 1300 West, Pleasant Grove, UT 84062, USA

²The Green House Center for Growth and Learning, 135 West Center Street, Pleasant Grove, UT 84062, USA

³223 TMCB Brigham Young University, Provo, UT 84602, USA

**Forschende
Komplementärmedizin**
Wissenschaft • Praxis • Perspektiven

Original Article • Originalarbeit

Forsch Komplementmed 2015;22:43–49
DOI: [10.1159/000380989](https://doi.org/10.1159/000380989)

Published online: February 19, 2015

Effects of Bergamot (*Citrus bergamia* (Risso) Wright & Arn.) Essential Oil Aromatherapy on Mood States, Parasympathetic Nervous System Activity, and Salivary Cortisol Levels in 41 Healthy Females

Eri Watanabe^a Kenny Kuchta^b Mari Kimura^a Hans Wilhelm Rauwald^c Tsutomu Kameid^d
Jiro Imanishi^e

proprietà anticancerogene del limonene

> *Oncology*. 1971;25(1):1-10. doi: 10.1159/000224548.

Inhibition of murine subcutaneous and intravenous benzo(rst)pentaphene Carcinogenesis by sweet orange oils and d-limonene

F Homburger, A Treger, E Boger

PMID: 5090417 DOI: 10.1159/000224548

FULL TEXT LINKS



ACTIONS



Received: 21 September 2020 | Revised: 26 February 2021 | Accepted: 26 March 2021
DOI: 10.1002/ptr.7125

REVIEW

WILEY

Anticancer activity of limonene: A systematic review of target signaling pathways

Heitor Gomes de Araújo-Filho¹ | Jucilene F. dos Santos² |
Mikaella T. B. Carvalho^{1,3} | Laurent Picot⁴ | Ingrid Fruitier-Arnaudin⁴ |
Hugo Groult⁴ | Lucindo J. Quintans-Júnior^{1,3} | Jullyana S.S. Quintans^{1,3}

Colloids and Surfaces B: Biointerfaces 112 (2013) 548–553



ELSEVIER

Contents lists available at ScienceDirect

Colloids and Surfaces B: Biointerfaces

journal homepage: www.elsevier.com/locate/colsurfb



Anticancer activity of liposomal bergamot essential oil (BEO) on human neuroblastoma cells

Christian Celia^{a,b,1}, Elena Trapasso^{c,1}, Marcello Locatelli^a, Michele Navarra^d,
Cinzia Anna Ventura^d, Joy Wolfram^{b,e}, Maria Carafa^f, Valeria Maria Morittu^c,
Domenico Britti^c, Luisa Di Marzio^{a,*,2}, Donatella Paolino^{c,*}



proprietà anticancerogene del BEO

2015 Royal Pharmaceutical Society, *Journal of Pharmacy and Pharmacology*, 67, pp. 1042–1053

JPP

Journal of Pharmacy
And Pharmacology

Research Paper

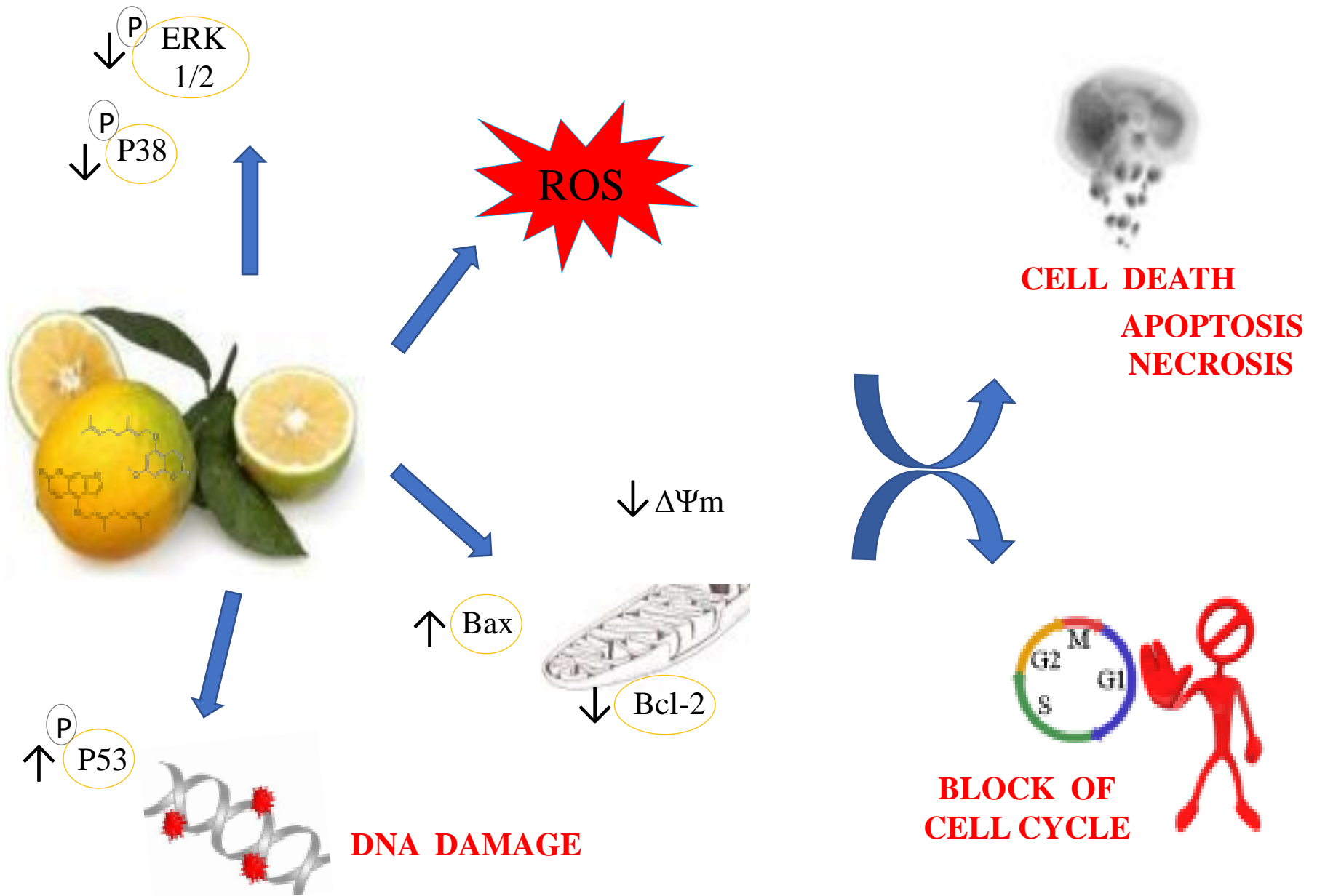
Effects of bergamot essential oil and its extractive fractions on SH-SY5Y human neuroblastoma cell growth

Michele Navarra^a, Nadia Ferlazzo^a, Santa Cirmi^a, Elena Trapasso^a, Placido Bramanti^b,
Giovanni Enrico Lombardo^a, Paola Lucia Minciullo^c, Gioacchino Calapai^c and Sebastiano Gangemi^{c,d}

Departments of ^aDrug Sciences and Products for Health, ^cClinical and Experimental Medicine, University of Messina, ^bIRCCS Centro Neurolesi 'Bonino Pulejo', ^dInstitute of Clinical Physiology, IFC CNR, Messina Unit, Messina, Italy




	BEO	BEO-FF	BEO-TF	BEO-FFi	BEO-TFi
Content of coumarins and psoralens (g/l)					
citropten	1.92	<u>traces</u>	6.13	<u>traces</u>	-
bergapten	2.07	<u>traces</u>	4.21	<u>traces</u>	-
bergamottin	<u>21.68</u>	18.19	39.20	<u>traces</u>	-
5- Geranyloxy-7-methoxycoumarin	1.42	1.29	2.82	<u>traces</u>	-
Volatile constituents (%)					
β-pinene	5.08	4.62	<u>traces</u>	4.85	<u>traces</u>
limonene	<u>38.89</u>	37.40	<u>traces</u>	36.76	<u>traces</u>
γ-terpinene	5.62	5.25	<u>traces</u>	4.78	<u>traces</u>
linalool	6.55	11.86	20.3	11.91	16.79
linalyl acetate	37	34.02	72	34.57	77

bergamottina e 5-geraniolossi-7-metossicumarina



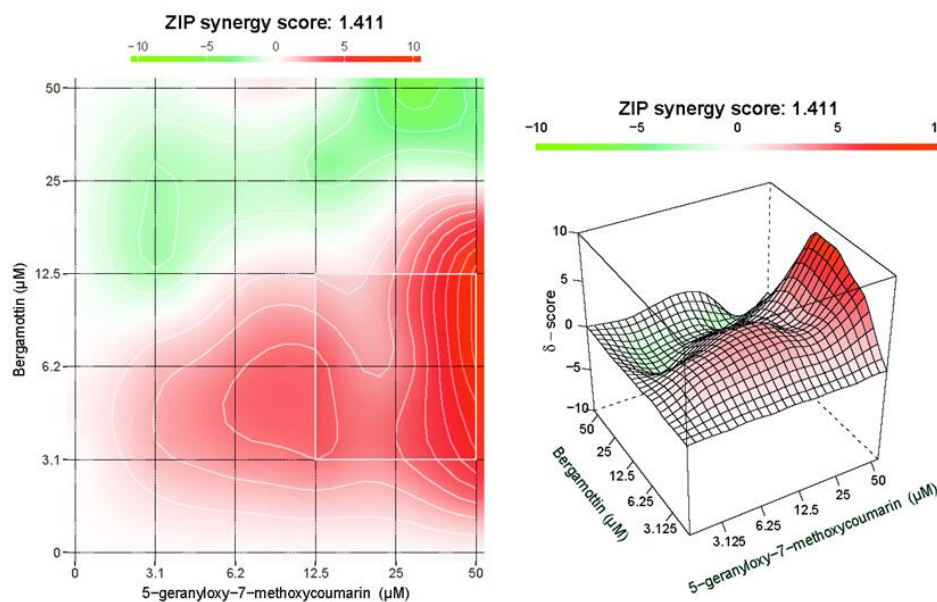
Article

Bergamottin and 5-Geranyloxy-7-methoxycoumarin Cooperate in the Cytotoxic Effect of *Citrus bergamia* (Bergamot) Essential Oil in Human Neuroblastoma SH-SY5Y Cell Line

Alessandro Maugeri ¹ , Giovanni Enrico Lombardo ¹, Laura Musumeci ¹, Caterina Russo ^{1,2}, Sebastiano Gangemi ³, Gioacchino Calapai ⁴, Santa Cirmi ^{1,5,*}  and Michele Navarra ¹ 

Toxins 2021, 13, 275. <https://doi.org/10.3390/toxins13040275>

<https://www.mdpi.com/journal/toxins>







proprietà antinfiammatorie ed antinocicettive del BEO



Article

Mechanisms Underlying the Anti-Inflammatory Activity of Bergamot Essential Oil and Its Antinociceptive Effects †

Giovanni Enrico Lombardo ¹, Santa Cirmi ¹, Laura Musumeci ^{1,2}, Simona Pergolizzi ¹,
Alessandro Maugeri ¹, Caterina Russo ^{1,2}, Carmen Mannucci ³, Gioacchino Calapai ³ and
Michele Navarra ^{1,*}

DERIVATI del BERGAMOTTO

il **BEO** contiene circa 350 composti (Costa et al., 2010)



frazione volatile (93-96 %)

limonene

linalolo

linalile acetato

α - e β -pinene

β -mircene

γ -terpinene

sabinene

β -bisabolene

geraniale

neril acetato

geranil acetato

frazione non volatile (4 -7 %)

psoraleni

coumarine polimetossilati

flavoni

cere

il **succo** contiene

(Gattuso et al., 2007)

flavonoidi:

neoeriocitrina

naringina

neoesperidina

melitidina

naringenina

esperetina

zuccheri ed

acidi grassi:

acido oleico

acido linoleico

acido palmitico

coumarine:

bergamottina

bergaptene

il **pastazzo** contiene

(Mandalari et al., 2006)

pectine

pastazzo di bergamotto

Review

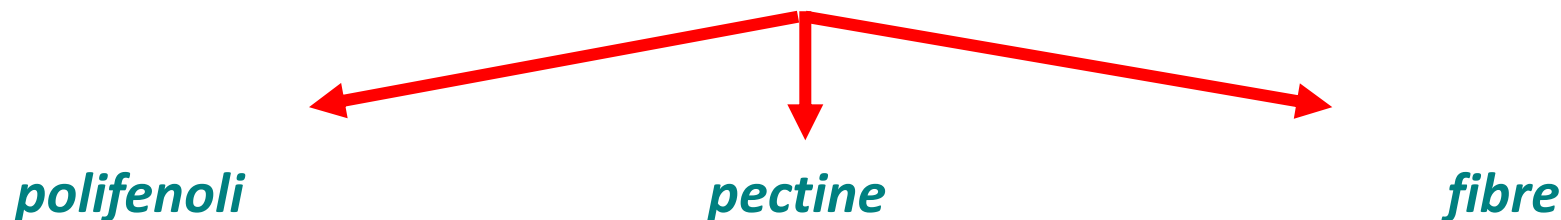
The Second Life of *Citrus* Fruit Waste: A Valuable Source of Bioactive Compounds †

Caterina Russo ^{1,2,‡}, Alessandro Maugeri ^{1,‡} , Giovanni Enrico Lombardo ¹, Laura Musumeci ¹,
Davide Barreca ¹ , Antonio Rapisarda ¹ , Santa Cirmi ^{1,3,*}  and Michele Navarra ^{1,*} 

Molecules **2021**, *26*, 5991. <https://doi.org/10.3390/molecules26195991>

<https://www.mdpi.com/journal/molecules>

«... the state of the art of a circular economy that can revolve around Citrus processing waste, highlighting how the recycling of seeds, exhausted peels, pressed pulp, leaves and juice from second pressing can become a source of substances to be reused in the cosmetic, pharmaceutical, food and packaging industries»



DERIVATI del BERGAMOTTO

il **succo** contiene

flavonoidi:

neohesperidina
naringina
neoesperidina
melitidina
naringenina
esperetina

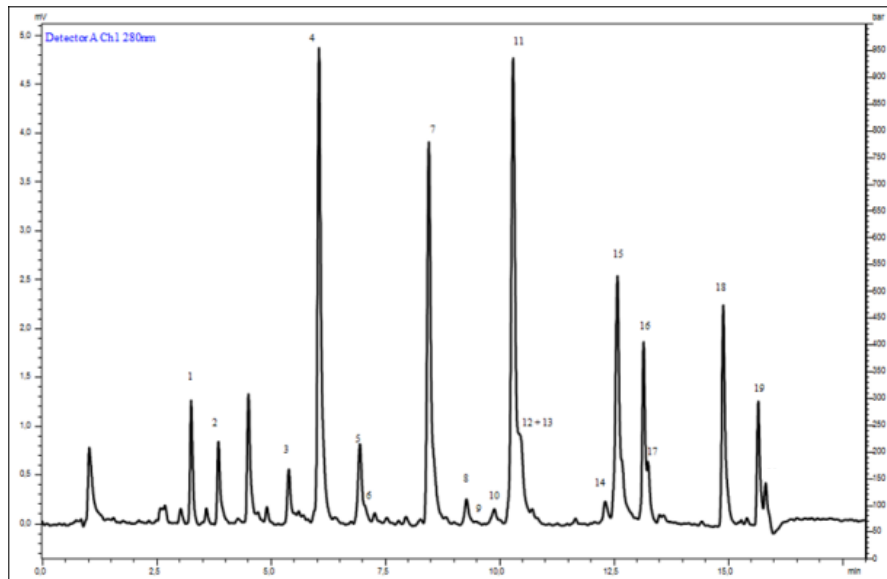
zuccheri ed acidi grassi:

acido oleico
acido linoleico
acido palmitico

coumarine:

bergamottina
bergaptene

Peak	Compound	Synonyms	Quantity mg/g
1	Apigenin 6,8 di C-glucoside	Lucenin-2	11.61
2	Diosmetin 6,8 di C-glucoside	Lucenin-2 4'-methyl ether	10.29
3	Eriodictiyl 7-O-rutinoside	Eriocitrin	8.89
4	Eriodictiyl 7-O-neohesperidoside	Neohesperidin	51.73
5	5,7-dihydroxy-4'-methoxyflavone 7-O-rutinoside	Poncirin	18.41
6	Diosmetin 8-C-glucoside	Orientin 4'-methylether	14.85
7	Naringenin 7-O-neohesperidoside	Naringin	91.90
8	Apigenin 7-O-neohesperidoside	Rhoifolin	19.96
9	Hesperetin 7-O-rutinoside	Hesperidin	7.5
10	Quercetin 3-β-glucopyranoside	Isoquercitrin	2.5
11	Hesperetin 7-O-neohesperidoside	Neohesperidin	98.5
12	Diosmetin 7-O-neohesperidoside	Neodiosmin	12.39
13	Apigenin 7-O-neohesperidoside-4'-glucoside	Rhoifolin 4'-glucoside	2.55
14	Naringenin 7-O-rutinoside	Narirutin	4.97
15	Naringenin 7-[2''-α-rhamnosyl-6'''-[3''''-hydroxy-3''''-methylglutaryl]β-glucoside]	Melitidin	79.47
16	Hesperetin 7-[2''-α-rhamnosyl-6'''-[3''''-hydroxy-3''''-methylglutaryl]β-glucoside]	Brutieridin	36
17	5,7-dihydroxy-2-(4-hydroxyphenyl)chroman-4-one	Naringenin	41.48
18	(S)-2,3-dihydro-5,7-dihydroxy-2-(3-hydroxy-4-methoxyphenyl)-4H-1-benzopyran-4-one	Hesperetin	53.84
19	5,7-dihydroxy-2-(3-hydroxy-4-methoxyphenyl)chromen-4-one	Diosmetin	12.36



succo di bergamotto

Aspetti salutistici e nutraceutici del succo di bergamotto
ohnutrition.com

Sindromet nutrum.it
Sindromet nutrum.it

Ricerche correlate
bergamotto pianta
chinotto frutto
calabria bergamotto

Benessere e salute - Bergasterol - Succo di bergamotto
bergasterol.it

Piante da Frutto Vendita Online - Piante ...
piantadafrutto.com

Succo di bergamotto 100% pu...
consorziosm.it

Bergamotto pressato anti tum...
essenzabergamotto.com

Succo Bergamotto Puro 100%...
mangiat.it - Disponibile

Ess. Deriv. Agr., 74, 97 ...
caprizzu.com

Bergamotto pressato anti tumorale
essenzabergamotto.com

Erboteria Zamboni L...
erboteriazamboni.it - D...

Cohesion Pharma Nurast Advance...
volfarm.it - Disponibile

Annunci - Acquista bergamotto neocerioictrina neoperidina

Natural Bergamotto + Lime 92 gr
15,00 €
Profumaria Camella

Olio integratore a base di bergamotto 10 ml
12,80 €
Biospeth
Spedizione gratuita

Greenatural bergamotto concentrato puro
35,85 €
Benessere srl

Bergacel - Bergacel Distillato Di Bergamotto 10cc
9,00 €
Aloe Store - L'Angol...

Greenatural - Bergamotto Concentrato - Drenante
34,35 €
SorgenteNatura
+5,00 € di spedizione

Succo di Bergamotto biologico 100%
2,60 €
Calabna Gourmet

Stampa - H&AD
head-natural.com

Il Fantastico Bergamotto - Bergamotto di Calabria
bergamottocalabria.org

V-C&M marketplace
marketam.com

Succo Bergamotto Puro 1...
mangiat.it - Disponibile

Ricerche correlate
bergamotto fiore
bergamotto ricette
bergamotto disegno

anuga
FASTER THE FUTURE
Mettiti O.2. RESCINE CALABRIA
Succo di bergamotto le S...
essenzabergamotto.com

Bergamotto: IL FRUTTO DELLA SALUTE...
erbasia.it

SINDROMET 30 COMPRESSE
farmaciafarmato.it

Bergasterol. Presentazione del prodotto
bergasterol.it

Revista di psichiatria

Notiziario Erboristeria Bios
erboristeria.com

Bergamotto - HP Ingredients
hpinredients.com

Bergamotto - HP Ingredients
hpinredients.com

Succo di bergamotto - Succhi di pianta - P...
giardinaggio.it

Frazione polifenolica del bergamotto...
nitastobionline.it

Come è composto il succo di bergamotto...
citrusbergamotte.com

Bergamotto frutto fresco calabrese biologico...
aromotto.it

Bergamotto in Erboristeria: Proprietà...
my-personaltrainer.it

Bergamotto in Erboristeria: Proprietà...
my-personaltrainer.it

Bergamotto - HP Ingredients
hpinredients.com

Aspetti salutistici e nutraceutici del succo di bergamotto - Sar...
ohnutrition.com

Il bergamotto dei desideri
calabrianweb.it

Bergamotto pressato anti tumorale
essenzabergamotto.com

CIBUS
CI TROVATE AL PAD 03 STAND 050

Bergamonte

Succo Bergamotto Puro 100%...
aromotto.it

Succo di bergamotto antioxi...
aromotto.it

RicicoPlus: un alleato contro il colesterolo in ecoc...
aromotto.it

Benessere e salute - Bergasterol
bergasterol.it

ERBA VITA Integratore Alimentare Di Bergamotto - 60 Cap...
amazon.it

Ricerche correlate
bergamotto png
bergamotto liquore
bergamotto proprie...

Table: Nutrient Content

Base	100g	100ml	100g	100ml
Rivolto (g)	236.0	100.0	236.0	100.0
Acqua (g)	209.4	100.0	209.4	100.0
Proteine (g)	1.0	0.5	1.0	0.5
Carboidrati (g)	12.6	6.3	12.6	6.3
Grassi (g)	0.4	0.2	0.4	0.2
Alcol (g)	0.0	0.0	0.0	0.0
Calorie (kcal)	52	26	52	26

Table: Bergamonte Nutrients

Elemento	Contenuto
Bergamonte Polifenolici	388.5 ± 3.5
Flavonoli	100.0 ± 2.0
Flavonoidi	100.0 ± 2.0
Polifenoli	100.0 ± 2.0
Flavonoidi	100.0 ± 2.0

Table: Singlet Oxygen

Singlet Oxygen	2299
Superoxide Radicals	1228
Hydroxyl Radicals	13395
Peroxy Radicals	5261
Hydroxyl Radicals	13395

Table: Chemical Structure

Chemical Structure 1	Chemical Structure 2
Chemical Structure 3	Chemical Structure 4

Table: Bergamotto Properties

Proprietà	Valore
Controllo	100
Studio	100

Table: Bergamotto Properties

Proprietà	Valore
Controllo	100
Studio	100

Table: Bergamotto Properties

Proprietà	Valore
Controllo	100
Studio	100

Table: Bergamotto Properties

Proprietà	Valore
Controllo	100
Studio	100

Table: Bergamotto Properties

Proprietà	Valore
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Studio	100

Table: Bergamotto Properties

Proprietà	Valore
Controllo	100
Studio	100

Table: Bergamotto Properties

Proprietà	Valore
Controllo	100
Studio	100

THE ANTICANCER EFFECTS OF BERGAMOT JUICE (BJ) IN DIFFERENT EXPERIMENTAL MODELS

in vitro

in vivo

Delle Monache S. et al.,
Mechanisms underlying the anti-tumoral effects of Citrus bergamia juice.
Plos One 2013

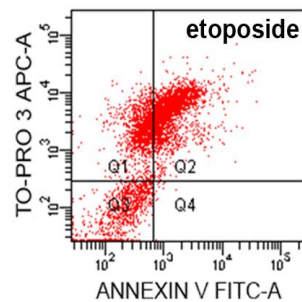
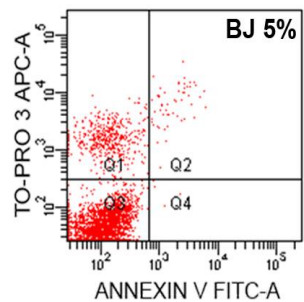
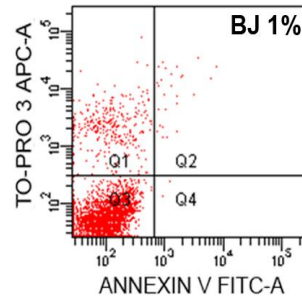
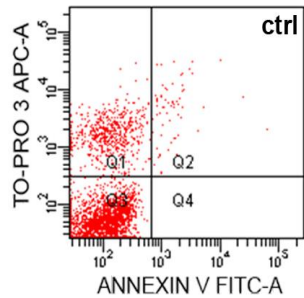
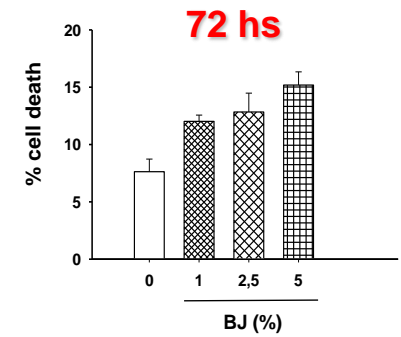
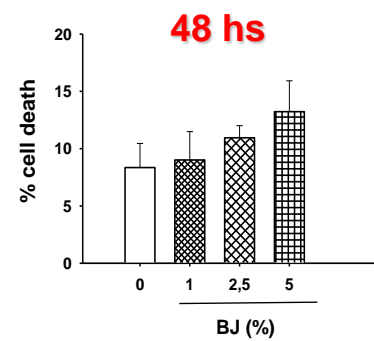
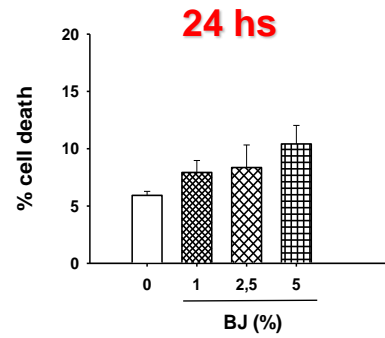
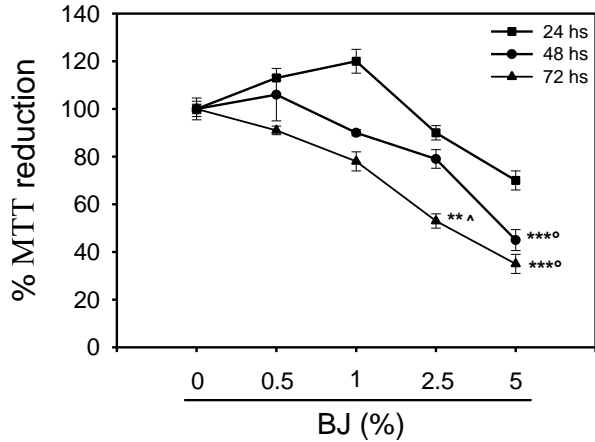
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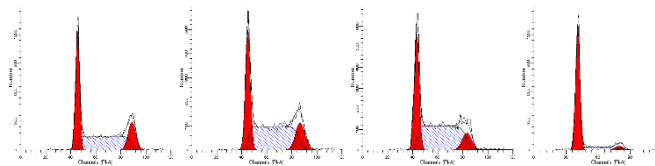
Navarra M. et al.,
Effect of Citrus bergamia juice on human neuroblastoma cells in vitro and in metastatic xenograft models.
Fitoterapia, 2014.

Navarra M. et al.,
A flavonoid-rich extract from bergamot juice prevents carcinogenesis in a genetic model of colorectal cancer, the Pirc rat (F344/NTac-Apc^{am1137}).
Eur J Nutr, 2019 .

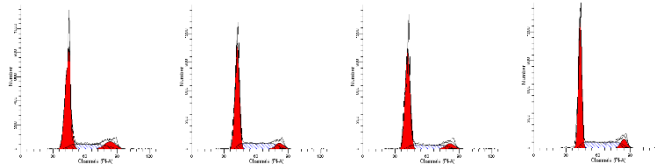
BERGAMOT JUICE REDUCES SH-SY5Y CELLS PROLIFERATION



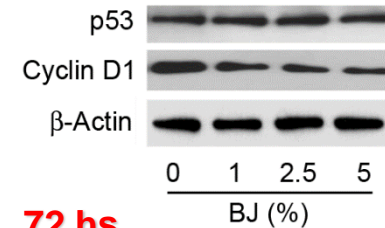
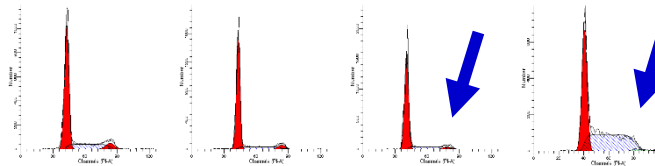
ctrl BJ 1% BJ 2.5% BJ 5%



24 hs

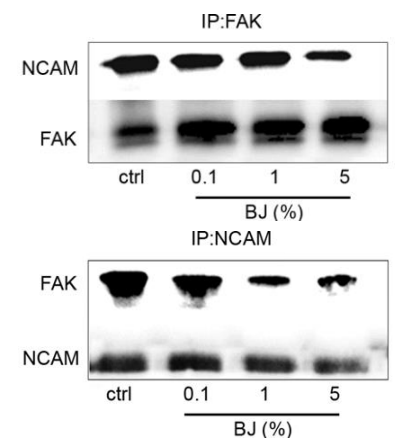
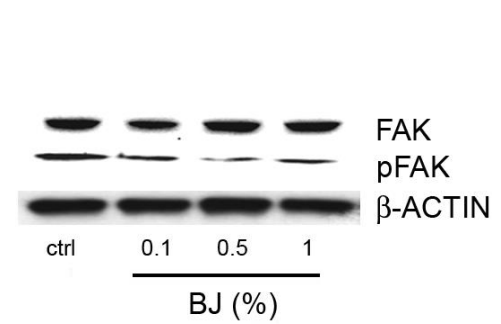
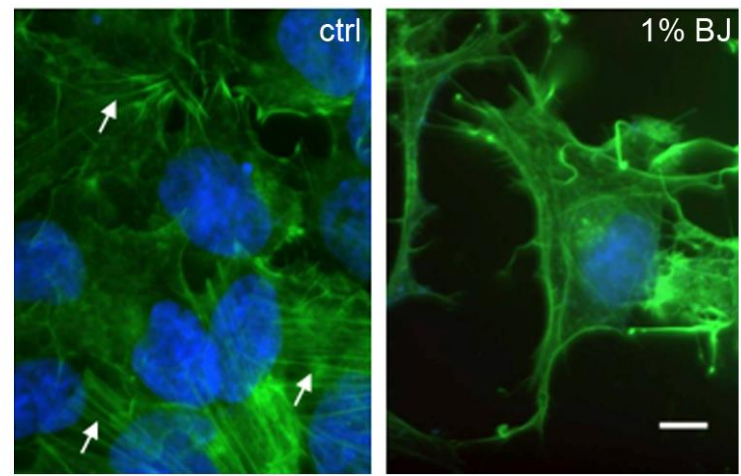
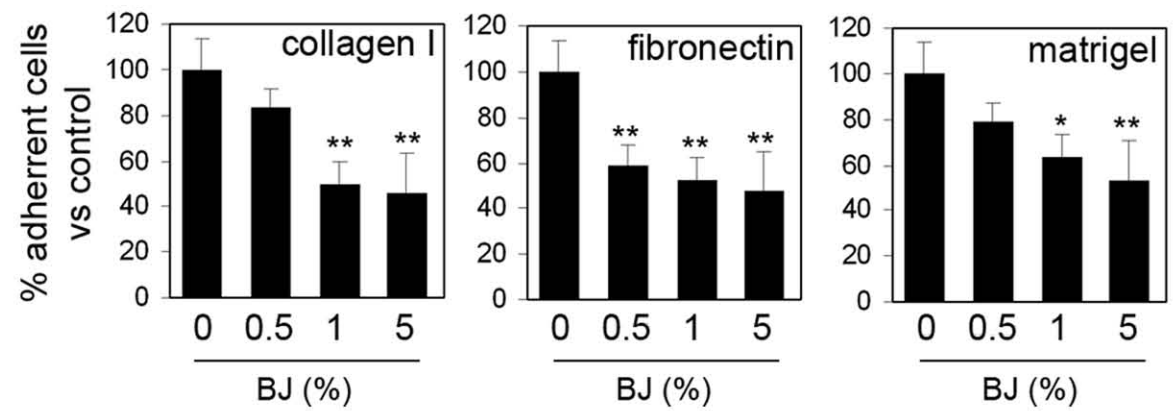
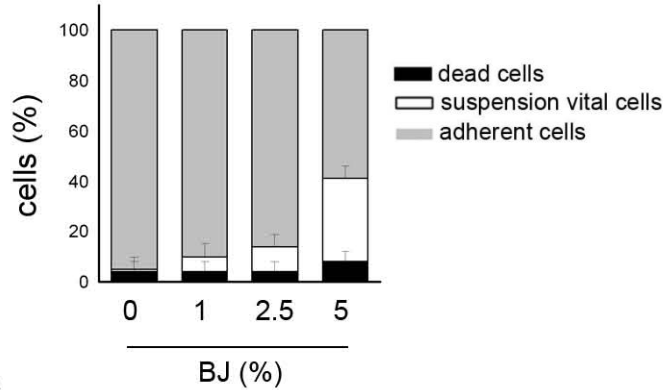
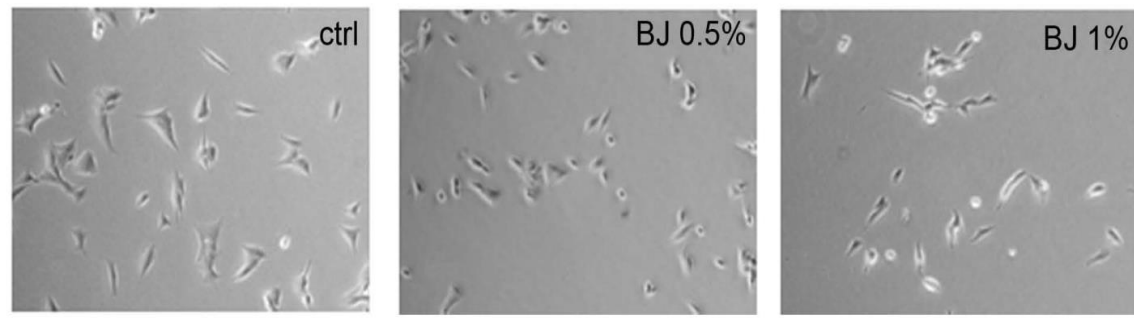


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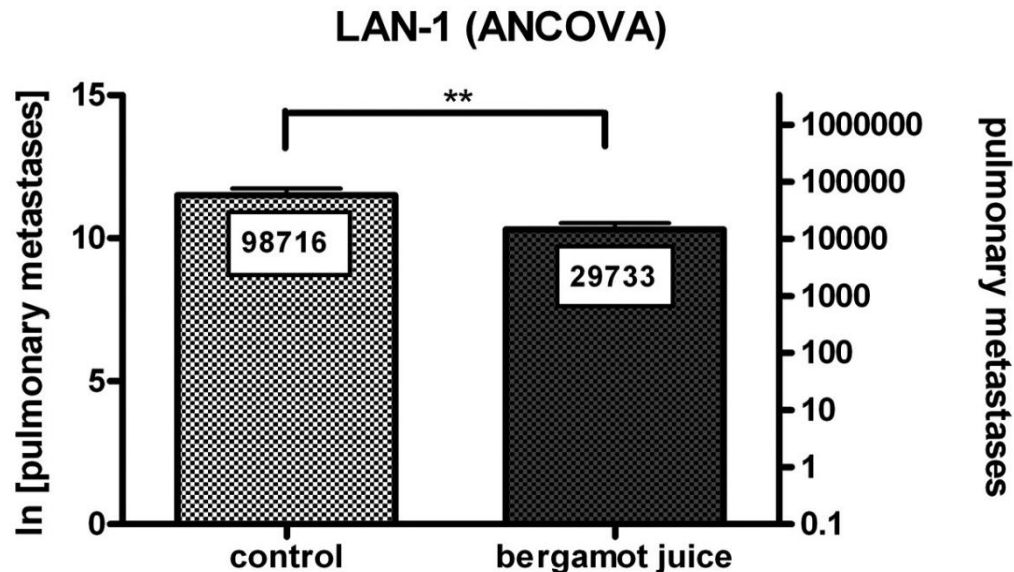
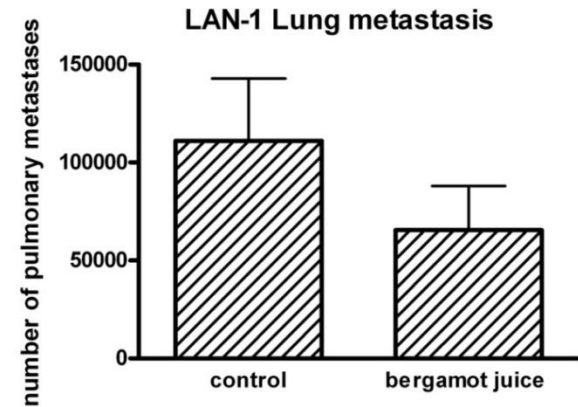
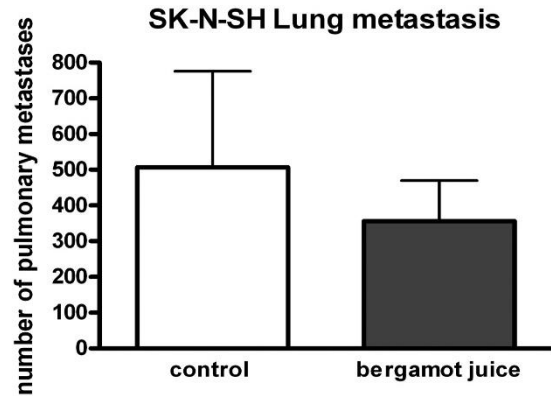


72 hs

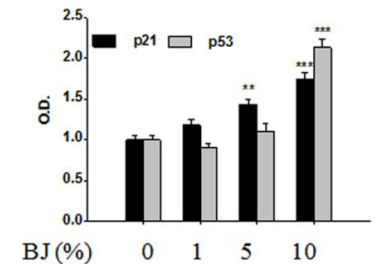
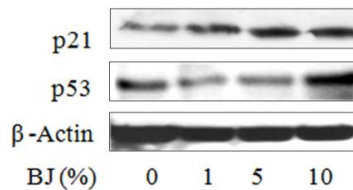
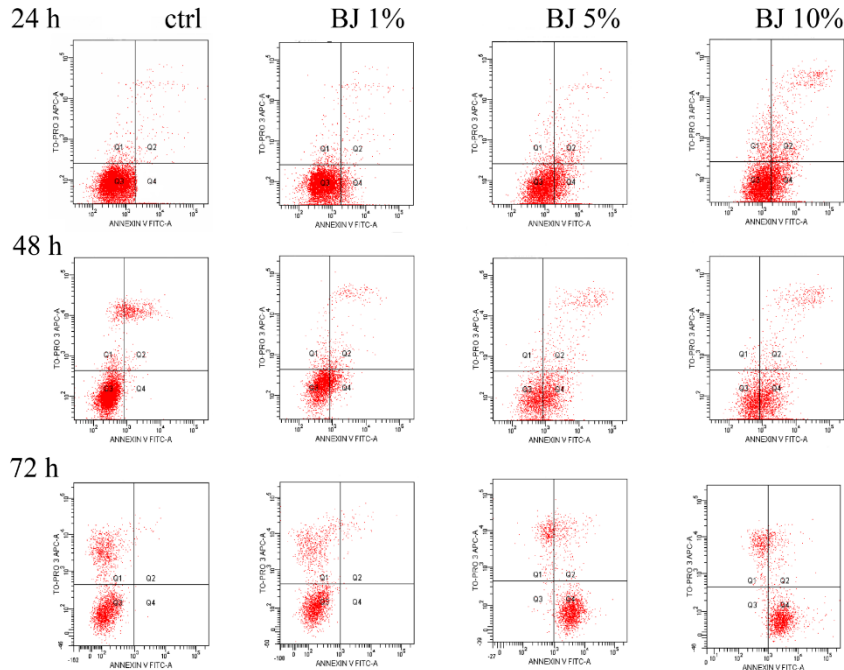
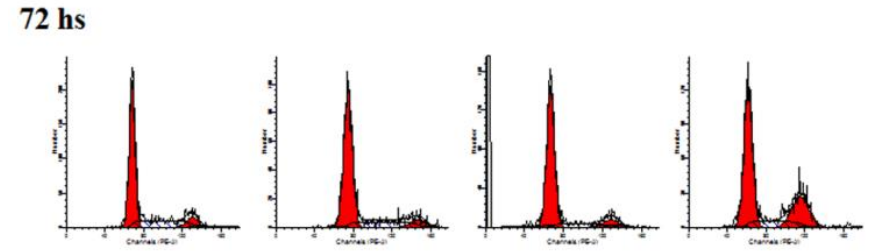
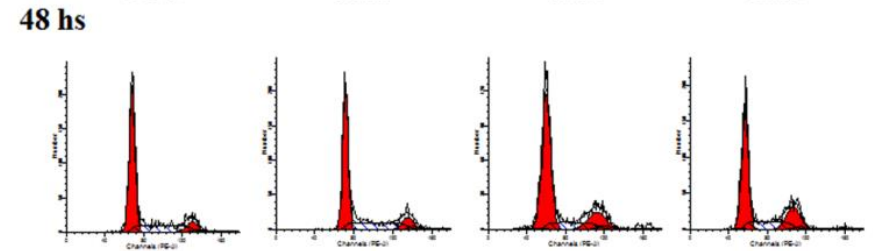
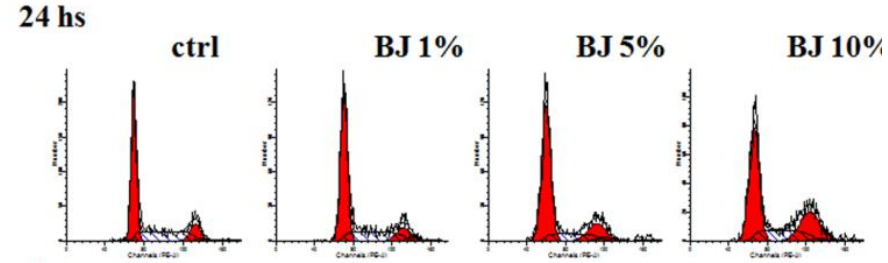
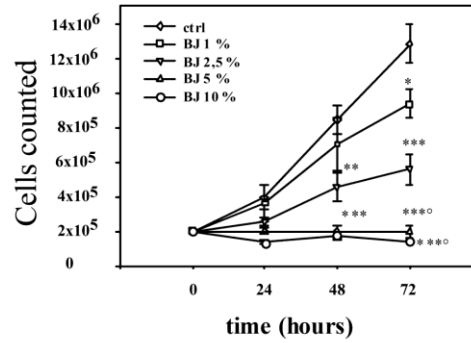
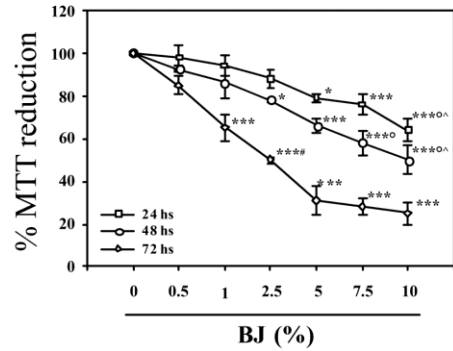
BJ DECREASES SH-SY5Y CELLS ADHESION



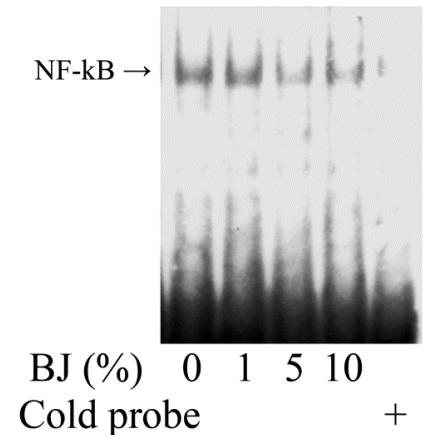
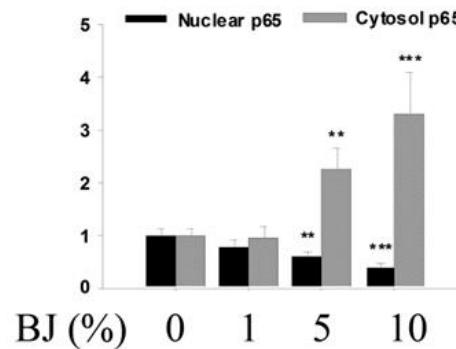
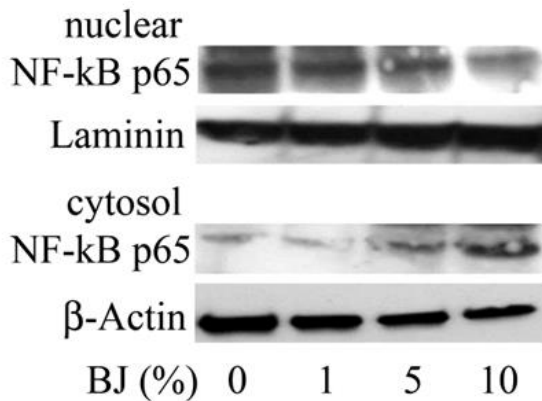
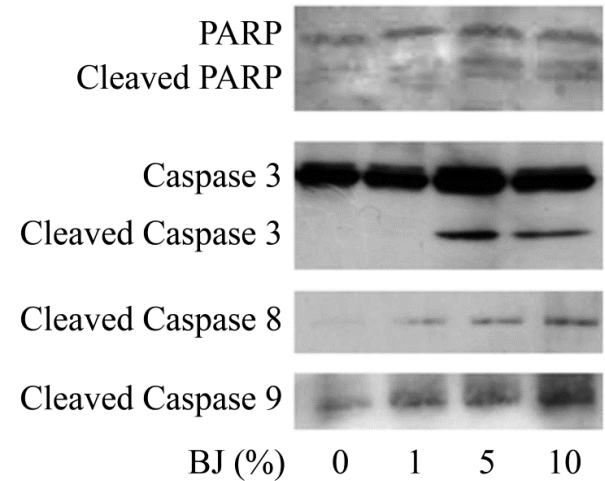
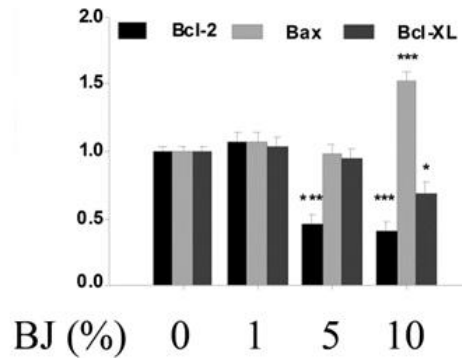
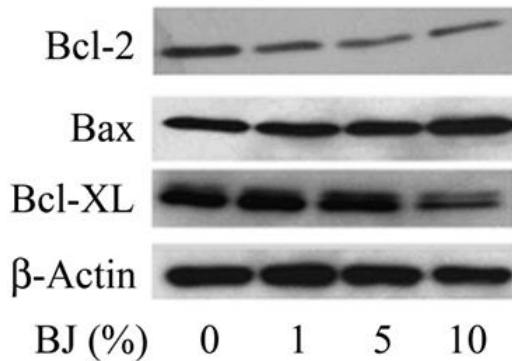
ANTI-METASTATIC ACTIVITY OF BERGAMOT JUICE IN A XENOGRAFT MODEL OF SPONTANEOUS NB METASTASIS FORMATION



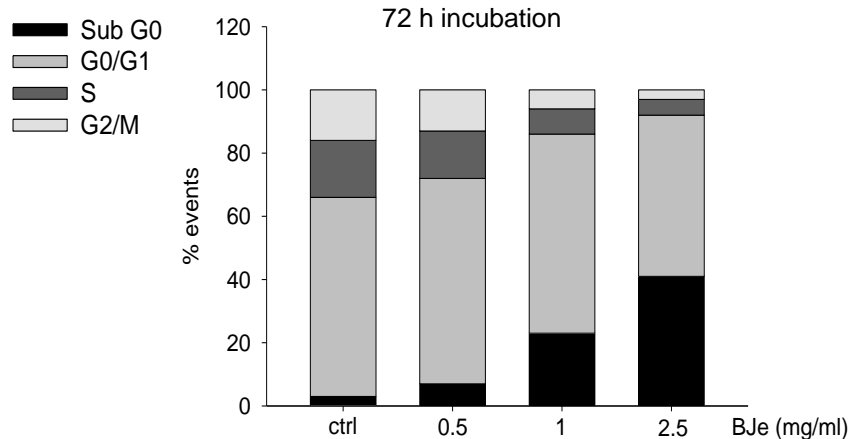
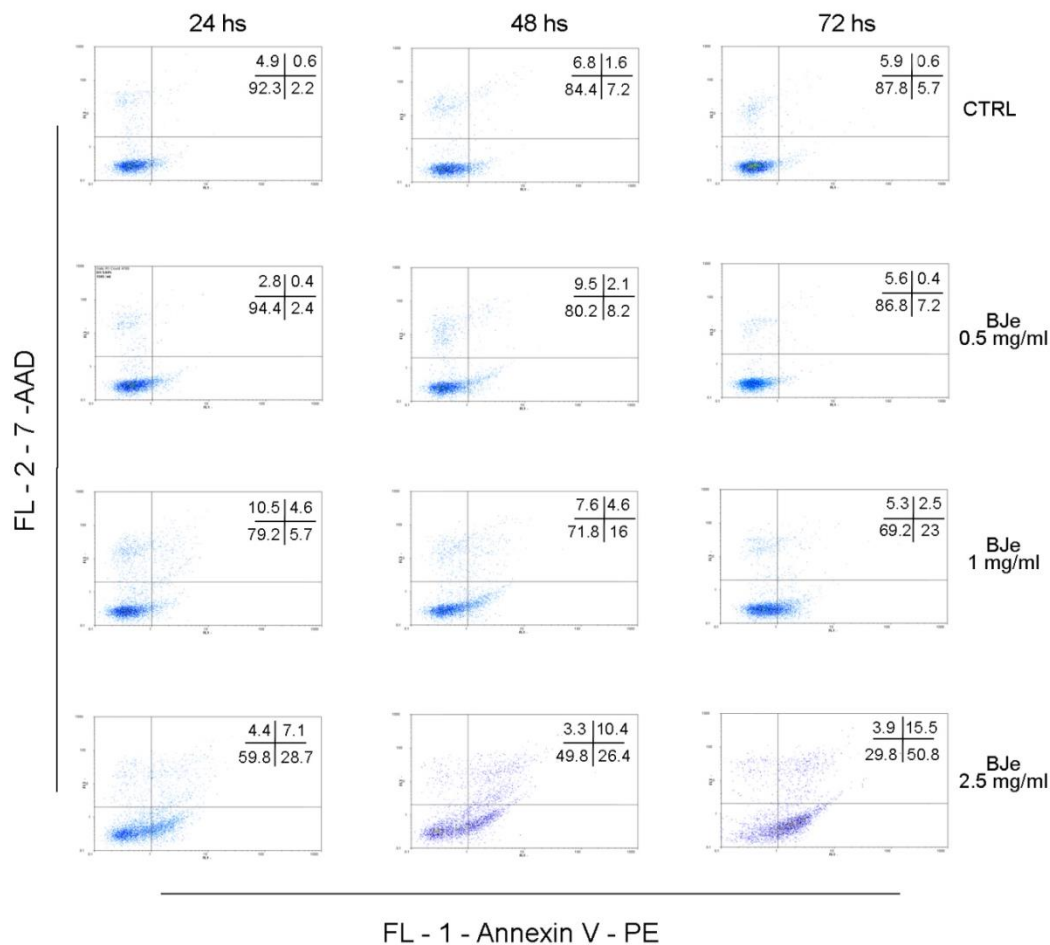
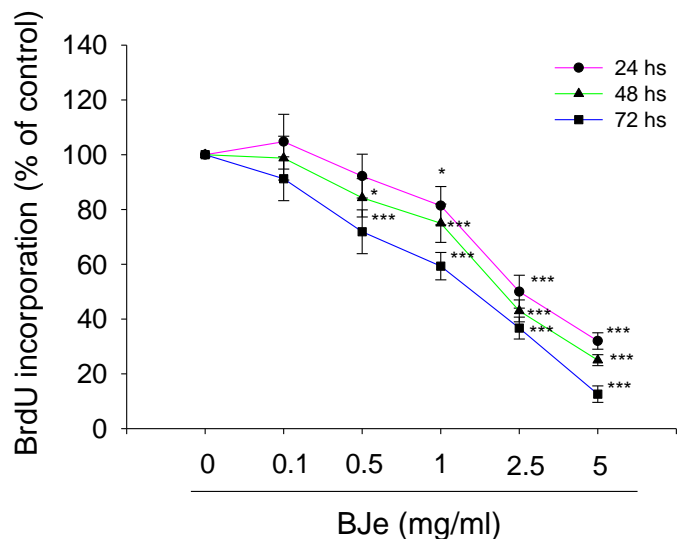
BJ REDUCES PROLIFERATION AND INDUCES APOPTOSIS IN HepG2 CELLS



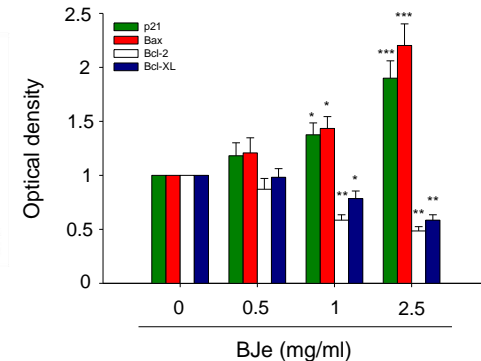
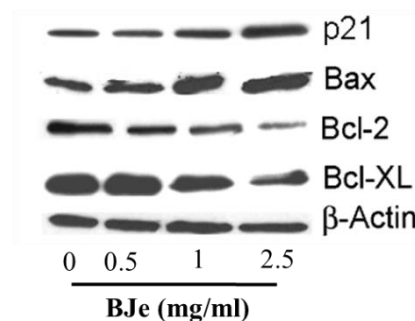
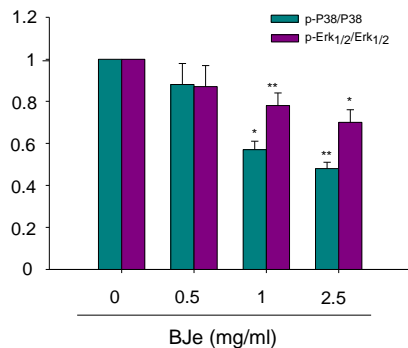
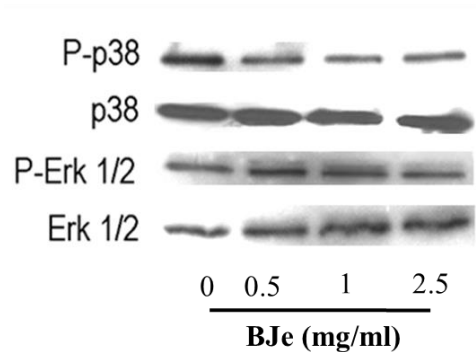
BJ INDUCES APOPTOSIS IN HepG2 CELLS



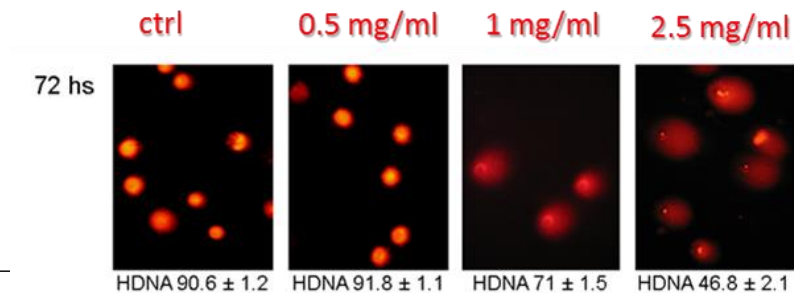
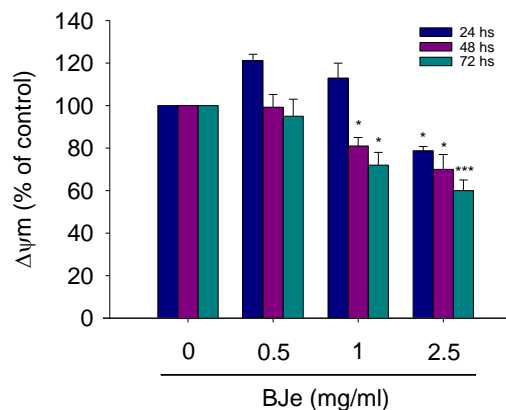
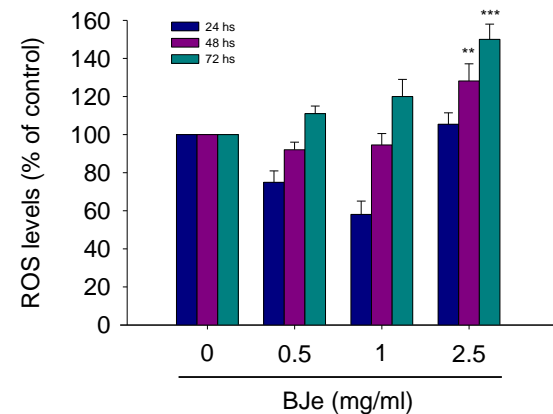
BJe INHIBITS HT-29 CELL GROWTH AND INDUCES APOPTOSIS BY MULTIPLE MECHANISMS



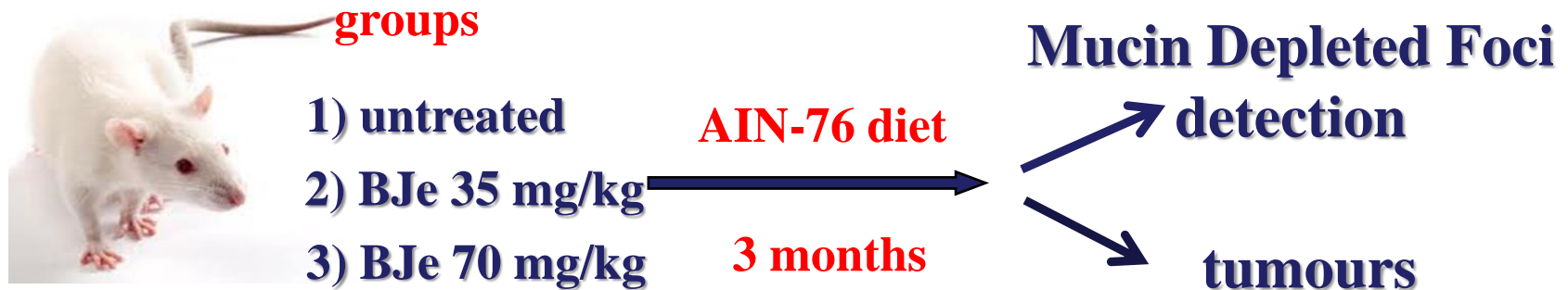
lower BJe concentrations suppressed MAPK pathways and modulated some apoptotic proteins



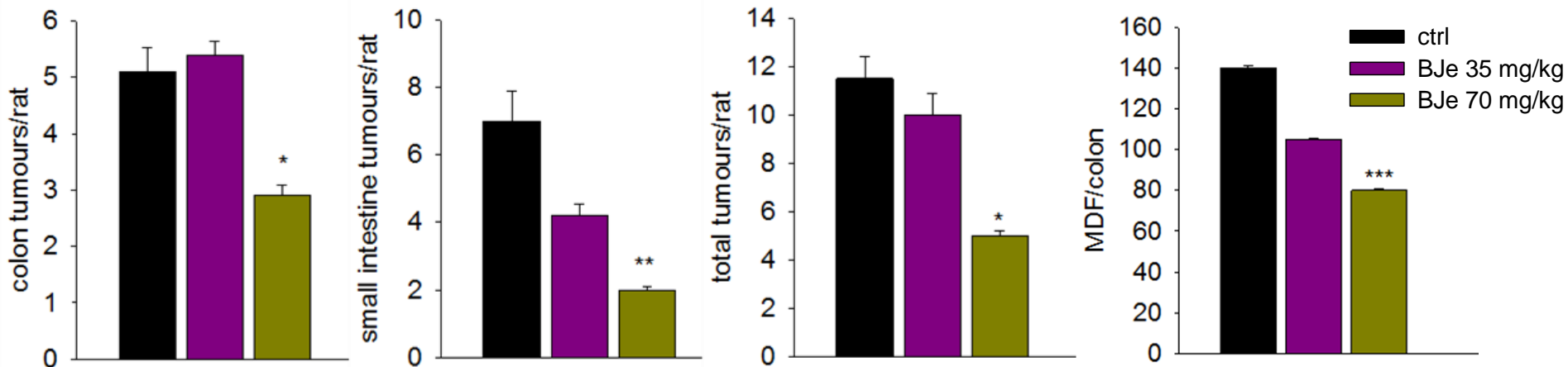
higher BJe raised ROS, leading to loss of MMP and DNA oxidative damage



EFFECTS OF BJe IN PIRC RATS (F344/NTAC-APC^{AM1137}), A GENETIC MODEL OF COLORECTAL CANCER

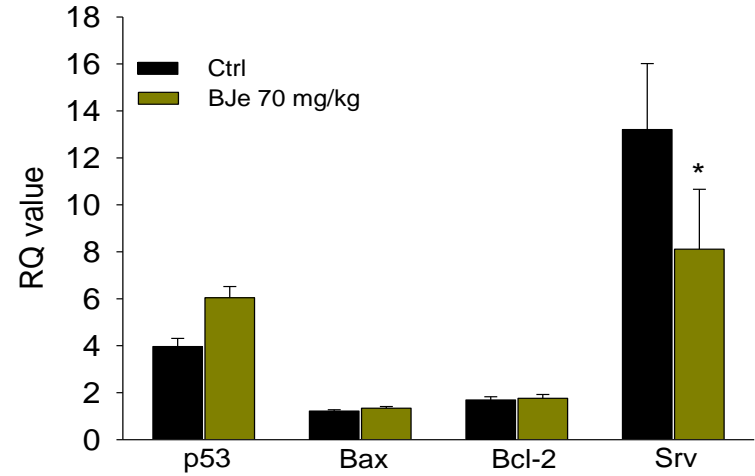
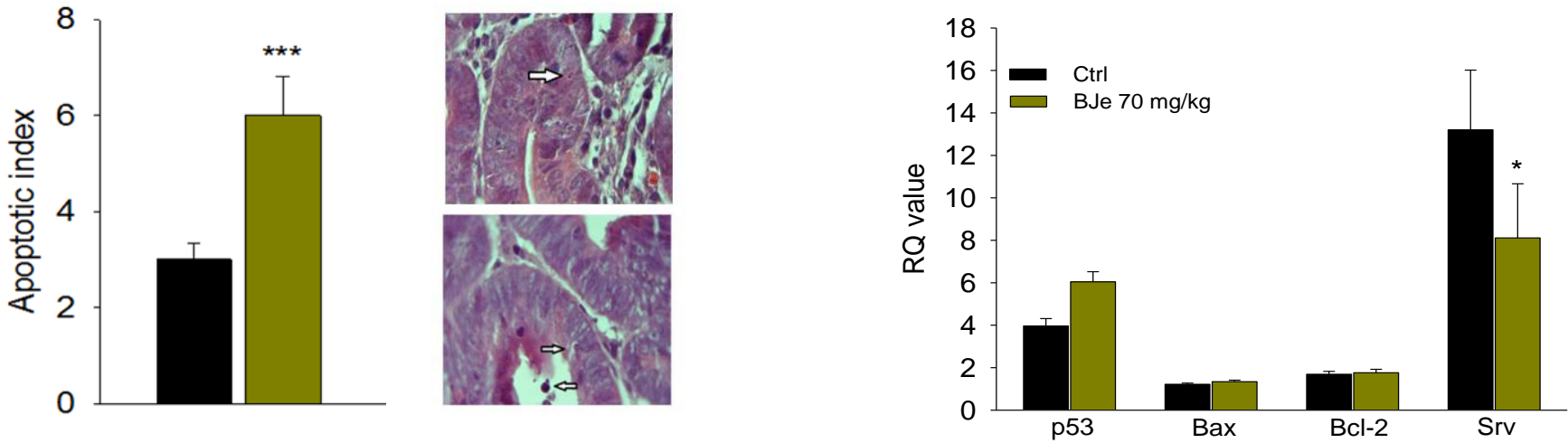


BJe REDUCES INTESTINAL TUMOURS AND PRENEOPLASTIC LESIONS IN PIRC RATS

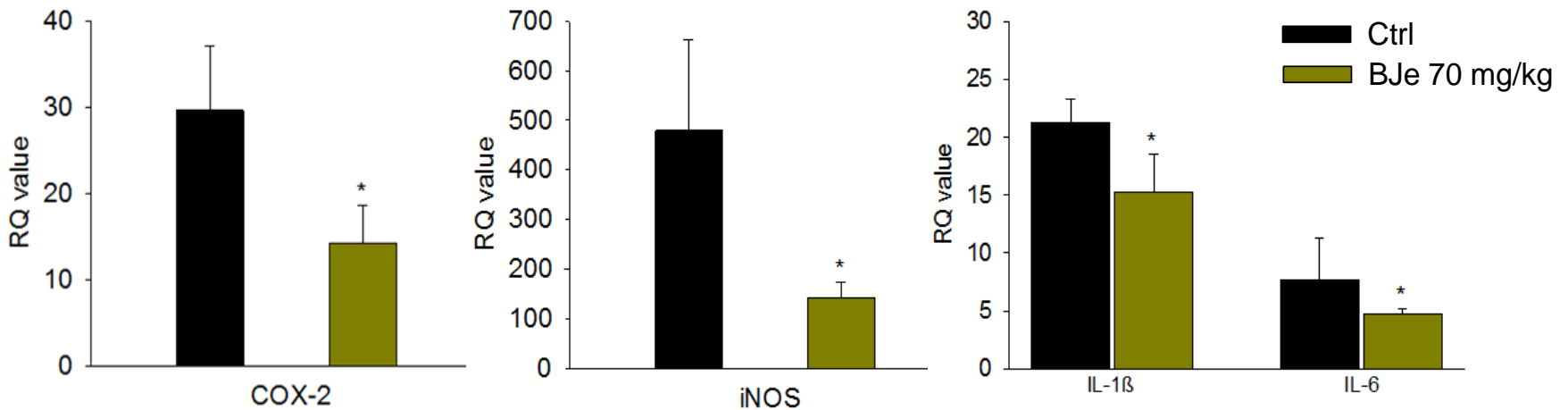


BJe INCREASES APOPTOSIS IN PIRC RATS

HISTOPATHOLOGICAL ANALYSIS AND qPCR DATA



ANTIINFLAMMATORY EFFECTS OF BJe IN PIRC RATS : qPCR DATA



effetto antiossidante ed antinfiammatorio

Environmental Toxicology and Pharmacology 43 (2016) 248–256

Contents lists available at ScienceDirect

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Citrus bergamia Juice Extract Attenuates β -Amyloid-Induced Pro-Inflammatory Activation of THP-1 Cells Through MAPK and AP-1 Pathways

Received: 04 September 2015

Accepted: 08 January 2016

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Monica Currò¹, Roberto Risitano¹, Nadia Ferlazzo², Santa Cirmi², Chiara Gangemi¹, Daniela Caccamo¹, Riccardo Ientile¹ & Michele Navarra²

Hindawi Publishing Corporation
Evidence-Based Complementary and Alternative Medicine
Volume 2015, Article ID 957031, 14 pages
<http://dx.doi.org/10.1155/2015/957031>



Hindawi

Research Article

Flavonoid Fraction of Orange and Bergamot Juices Protect Human Lung Epithelial Cells from Hydrogen Peroxide-Induced Oxidative Stress

Nadia Ferlazzo¹, Giuseppa Visalli², Antonella Smeriglio¹, Santa Cirmi¹, Giovanni Enrico Lombardo¹, Pietro Campiglia³, Angela Di Pietro², and Michele Navarra¹

Natural iron chelators: Protective role in A549 cells of flavonoids-rich extracts of *Citrus* juices in Fe³⁺-induced oxidative stress



CrossMark

Nadia Ferlazzo^{a,1}, Giuseppa Visalli^{b,1}, Santa Cirmi^a, Giovanni Enrico Lombardo^a, Pasqualina Laganà^b, Angela Di Pietro^{b,*}, Michele Navarra^a

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Flavonoid Fraction of Bergamot Juice Reduces LPS-Induced Inflammatory Response through SIRT1-Mediated NF- κ B Inhibition in THP-1 Monocytes

Roberto Risitano², Monica Currò², Santa Cirmi¹, Nadia Ferlazzo¹, Pietro Campiglia³, Daniela Caccamo¹, Riccardo Ientile², Michele Navarra^{1*}



pharmaceutics

Article

Neuroprotective Effect of Bergamot Juice in 6-OHDA-Induced SH-SY5Y Cell Death, an In Vitro Model of Parkinson's Disease

Nadia Ferlazzo^{1,2}, Santa Cirmi¹, Alessandro Maugeri¹, Caterina Russo^{1,3}, Giovanni Enrico Lombardo¹, Sebastiano Gangemi⁴, Gioacchino Calapai⁵, Vincenzo Mollace² and Michele Navarra^{1,*}

effetto antiossidante ed antinfiammatorio

Clinical Nutrition 34 (2015) 1146–1154

Contents lists available at ScienceDirect

Clinical Nutrition

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Anti-inflammatory and Antioxidant Effects of Flavonoid-Rich Fraction of Bergamot Juice (BJe) in a Mouse Model of Intestinal Ischemia/Reperfusion Injury

Daniela Impellizzeri¹, Marika Cordaro¹, Michela Campolo¹, Enrico Gugliandolo¹, Emanuela Esposito¹, Filippo Benedetto², Salvatore Cuzzocrea^{1,3*} and Michele Navarra¹



Article

A Flavonoid-Rich Extract from Bergamot Juice, Alone or in Association with Curcumin and Resveratrol, Shows Protective Effects in a Murine Model of Cadmium-Induced Testicular Injury

Nadia Ferlazzo¹, Antonio Micali¹, Herbert Ryan Marini², Josè Freni¹, Giuseppe Santoro¹, Domenico Puzzolo¹, Francesco Squadrito², Giovanni Pallio², Michele Navarra³, Santa Cirmi^{3,4,*} and Letteria Minutoli²

ORIGINAL RESEARCH
published: 15 July 2016
doi: 10.3389/fphar.2016.00203

Treatment With a Flavonoid-Rich Fraction of Bergamot Juice Improved Lipopolysaccharide-Induced Periodontitis in Rats

Enrico Gugliandolo^{1†}, Roberta Fusco^{1†}, Ramona D'Amico¹, Matteo Peditto², Giacomo Oteri², Rosanna Di Paola¹, Salvatore Cuzzocrea^{1,3*} and Michele Navarra¹



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Original article

The anti-inflammatory and antioxidant effects of bergamot juice extract (BJe) in an experimental model of inflammatory bowel disease

Daniela Impellizzeri^a, Giuseppe Bruschetta^a, Rosanna Di Paola^a, Akbar Ahmad^a, Michela Campolo^a, Salvatore Cuzzocrea^{a,b,*}, Emanuela Esposito^a, Michele Navarra^c

effetto antilipidemico del BJ

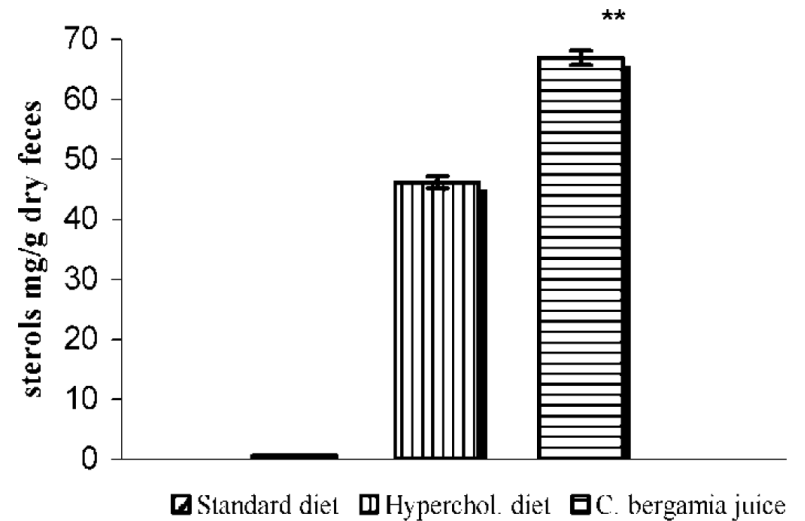
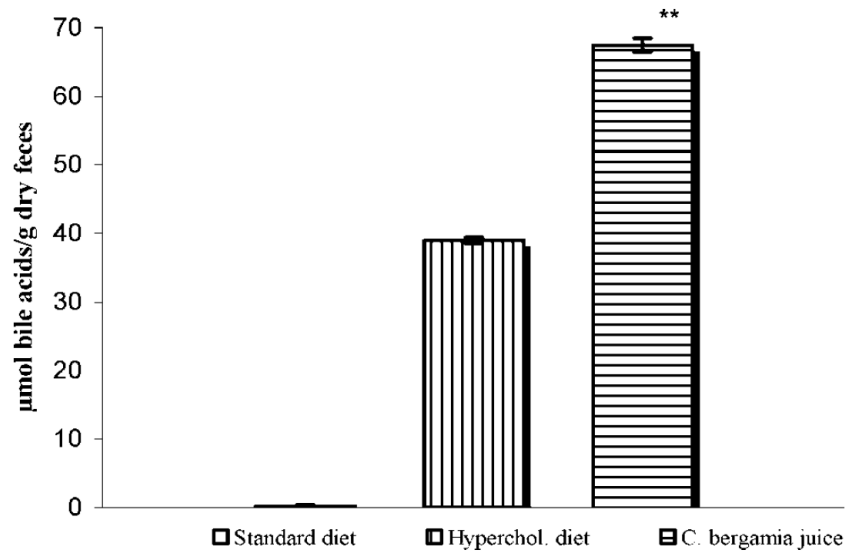
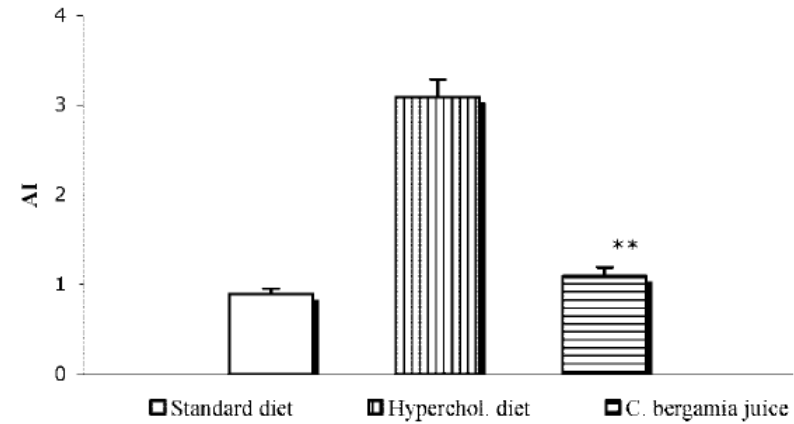
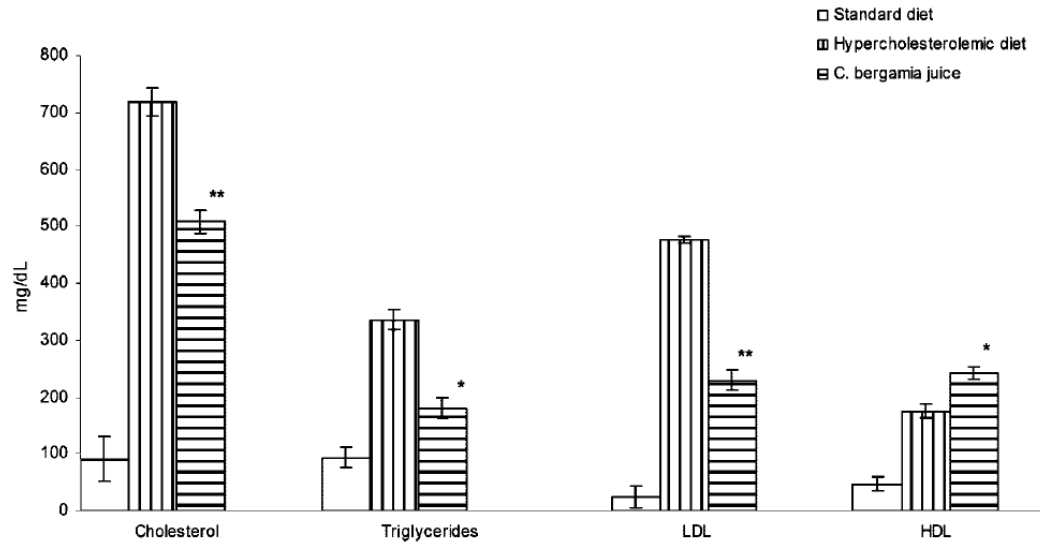
JOURNAL OF
AGRICULTURAL AND
FOOD CHEMISTRY

J. Agric. Food Chem. 2007, 55, 10671–10677 10671

Hypolipidemic Effects of *Citrus bergamia* Risso et Poiteau Juice in Rats Fed a Hypercholesterolemic Diet

NATALIZIA MICELI,^{*†} MARIA R. MONDELLO,[†] MARIA T. MONFORTE,[†]
VASILEIOS SDRAFKAKIS,[†] PAOLA DUGO,[#] MARIA L. CRUPI,[§] MARIA F. TAVIANO,[†]
RITA DE PASQUALE,[†] AND ADA TROVATO[†]

effetto antilipidemico del BJ



effetto antilipidemico dei polifenoli del BJ

Fitoterapia 82 (2011) 309–316



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Fitoterapia

journal homepage: www.elsevier.com/locate/fitote



Hypolipemic and hypoglycaemic activity of bergamot polyphenols: From animal models to human studies

Vincenzo Mollace^{a,b,d,*}, Iolanda Sacco^b, Elzbieta Janda^a, Claudio Malara^b, Domenica Ventrice^b, Carmen Colica^a, Valeria Visalli^b, Saverio Muscoli^c, Salvatore Ragusa^a, Carolina Muscoli^a, Domenicantonio Rotiroti^a, Franco Romeo^c

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^b C.E.T.A (Centro d'Eccellenza in Tossicologia Alimentare), ARPACal, Catanzaro, Italy

^c Department of Cardiology, Tor Vergata University, Rome, Italy

^d Vascular Medicine and Atherosclerosis Unit, Cardiology, Salus Medical Center, Marinella di Bruzzano, Italy

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ABSTRACT

Bergamot juice produces hypolipemic activity in rats though the mechanism remains unclear. Here we investigated on the effect of bergamot extract (BPF) in diet-induced hyperlipemia in Wistar rats and in 237 patients suffering from hyperlipemia either associated or not with hyperglycaemia. BPF, given orally for 30 days to both rats and patients, reduces total and LDL cholesterol levels (an effect accompanied by elevation of cHDL), triglyceride levels and by a significant decrease in blood glucose. Moreover, BPF inhibited HMG-CoA reductase activity and enhanced reactive vasodilation thus representing an efficient phytotherapeutic approach in combating hyperlipemic and hyperglycaemic disorders.

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effetto antilipidemico dei polifenoli del BJ

... altri studi clinici

International Journal of Cardiology 170 (2013) 140–145



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International Journal of Cardiology

journal homepage: www.elsevier.com/locate/ijcard






Bergamot polyphenolic fraction enhances rosuvastatin-induced effect on LDL-cholesterol, LOX-1 expression and protein kinase B phosphorylation in patients with hyperlipidemia

Micaela Gliozzi ^{a,1}, Ross Walker ^{a,1}, Saverio Muscoli ^{b,1}, Cristiana Vitale ^{c,1}, Santo Gratteri ^{a,1}, Cristina Carresi ^{a,1}, Vincenzo Musolino ^{a,1}, Vanessa Russo ^{a,1}, Elzbieta Janda ^{a,1}, Salvatore Ragusa ^{a,1}, Antonio Aloe ^{a,1}, Ernesto Palma ^{a,1}, Carolina Muscoli ^{a,1}, Franco Romeo ^{b,1}, Vincenzo Mollace ^{a,c,*,1}



Article

Atherogenic Index Reduction and Weight Loss in Metabolic Syndrome Patients Treated with A Novel Pectin-Enriched Formulation of Bergamot Polyphenols

Antonio Soccorso Capomolla ¹, Elzbieta Janda ^{2,3,*}, Sara Paone ³, Maddalena Parafati ^{2,3} , Tomasz Sawicki ^{2,4} , Rocco Mollace ^{2,3}, Salvatore Ragusa ²  and Vincenzo Mollace ^{2,3,5,*}

effetto antilipidemico del BJ

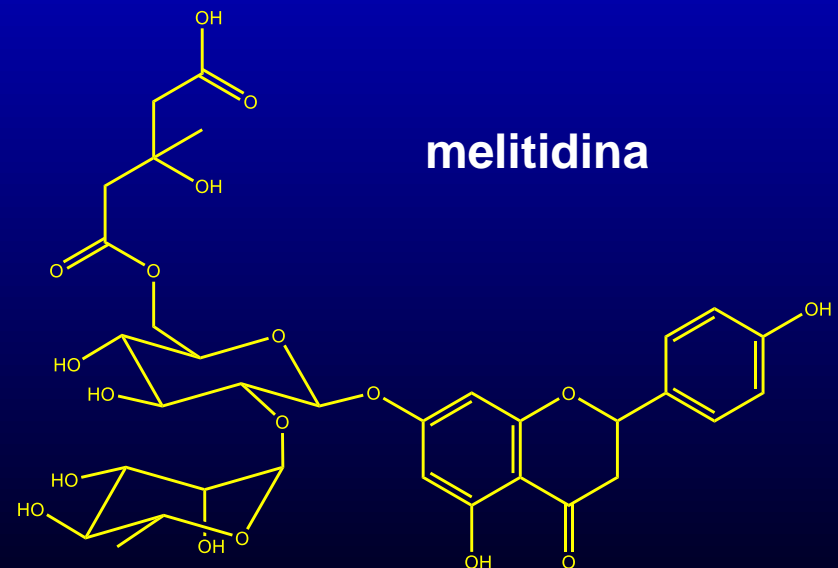
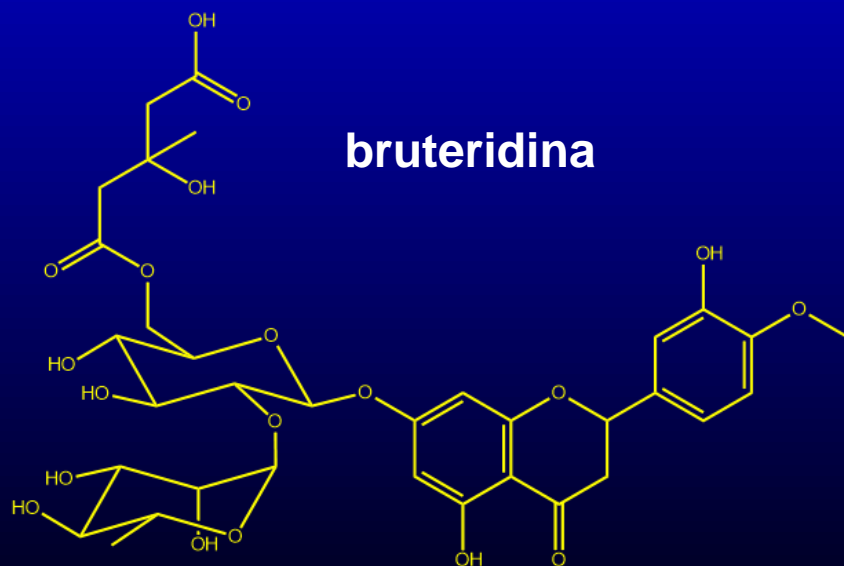
1352

J. Nat. Prod. **2009**, 72, 1352–1354

Statin-like Principles of Bergamot Fruit (*Citrus bergamia*): Isolation of 3-Hydroxymethylglutaryl Flavonoid Glycosides

Leonardo Di Donna, Giuseppina De Luca, Fabio Mazzotti, Anna Napoli, Raffaele Salerno, Domenico Taverna, and Giovanni Sindona*

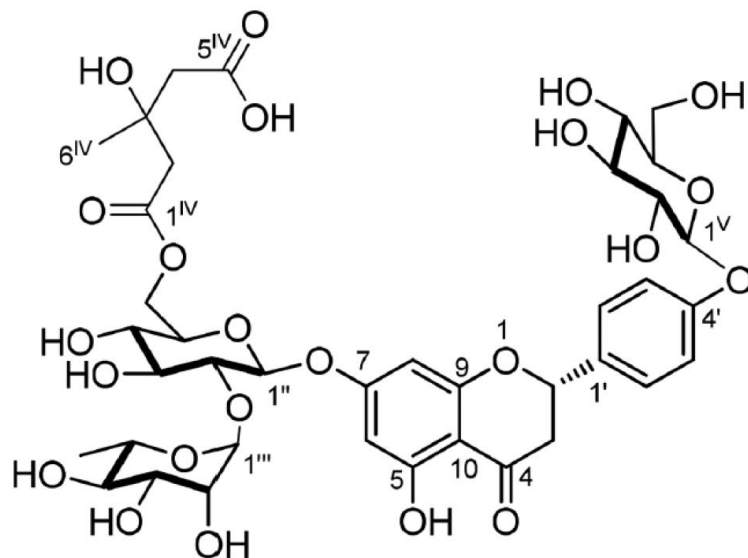
Dipartimento di Chimica, Università della Calabria, Via P. Bucci, cubo 12/C, I-87030 Arcavacata di Rende (CS), Italy



nuovo flavanone del BJ

Detailed Phytochemical Characterization of Bergamot Polyphenolic Fraction (BPF) by UPLC-DAD-MS and LC-NMR

Carmen Formisano,[†] Daniela Rigano,[†] Annalisa Lopatriello,[†] Carmina Sirignano,[†] Giuseppe Ramaschi,[‡] Lolita Arnoldi,[‡] Antonella Riva,[‡] Nicola Sardone,^{*,‡} and Orazio Tagliatela-Scafati^{*,‡}



Bergamjuicin

nuove formulazioni

Endocrine, Metabolic & Immune Disorders - Drug Targets, 2019, 19, 136-143



RESEARCH ARTICLE

Hypoglycemic and Hypolipemic Effects of a New Lecithin Formulation of Bergamot Polyphenolic Fraction: A Double Blind, Randomized, Placebo-Controlled Study

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Bergamotto ... 500 mg

Polifenoli Bergamotto 1000 mg

%di riduzione di C-LDL richiesta per raggiungere il target clinico

-20 | -25 | -30 | -35 | -40 | -45 | -50 | -55 | -60

Simva 10 mg

Simva 20 mg

Simva 40 mg

Atorvastatina 10 mg

Atorvastatina 20 mg

Atorvastatina 40 mg

Rosuvastatina 10 mg

Rosuvastatina 20 mg

Rosuvastatina 40 mg

Prima linea

Simva + Eze 20 mg/10 mg

Simva + Eze 40 mg/10 mg

Seconda linea

RESEARCH ARTICLE

WILEY

Bergamot phytosome improved visceral fat and plasma lipid profiles in overweight and obese class I subject with mild hypercholesterolemia: A randomized placebo controlled trial

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frontiers
in Pharmacology

ORIGINAL RESEARCH
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Bergamot Reduces Plasma Lipids, Atherogenic Small Dense LDL, and Subclinical Atherosclerosis in Subjects with Moderate Hypercholesterolemia: A 6 Months Prospective Study

Peter P. Toth^{1,2,3}, Angelo M. Patti^{4,5}, Dragana Nikolic⁴, Rosaria V. Giglio^{4,5}, Giuseppa Castellino⁴, Teresa Biancucci⁴, Fabiana Geraci^{5,6}, Sabrina David⁷, Giuseppe Montalto^{2,8}, Ali Rizvi⁹ and Manfredi Rizzo^{4,5,9*}

frazione flavonoidica del BJ

150 mg

+

estratto di cardo selvatico

+

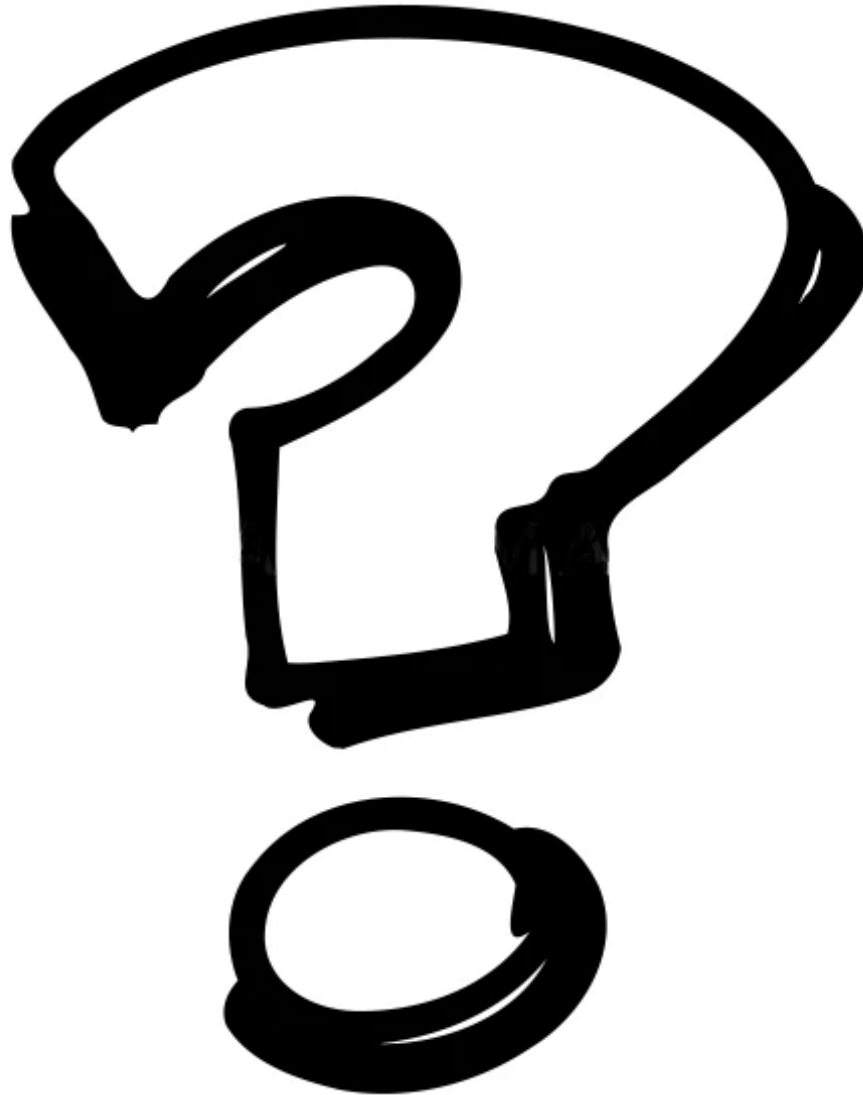
5 % di cinaropicrina

fibre dell'albedo del bergamotto

Randomized Clinical Trial: Bergamot Citrus and Wild Cardoon Reduce Liver Steatosis and Body Weight in Non-diabetic Individuals Aged Over 50 Years

Yvelise Ferro^{1†}, *Tiziana Montalcini*^{2*†}, *Elisa Mazza*³, *Daniela Foti*¹, *Elvira Angotti*², *Micaela Gliozzi*¹, *Saverio Nucera*¹, *Sara Paone*¹, *Ezio Bombardelli*⁴, *Ilaria Aversa*², *Vincenzo Musolino*¹, *Vincenzo Mollace*¹ and *Arturo Pujia*³

... e gli effetti avversi ?



grazie per l'attenzione

