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& Technology**
Nourishing Your
Business
EXHIBITION & CONFERENCE
www.in-vitality.it



20-21
November
2019
MiCo, Milano

20 NOVEMBRE 2019
Mi.Co Milano

Sviluppo industriale di nuovi integratori con derivati botanici: esempi recenti

Paolo Morazzoni

Scientific Advisor

Indena S.p.A.
Milano

MERCATO ITALIANO DEGLI INTEGRATORI:

DINAMICHE DISTRIBUTIVE AGGIORNATE A MARZO 2019

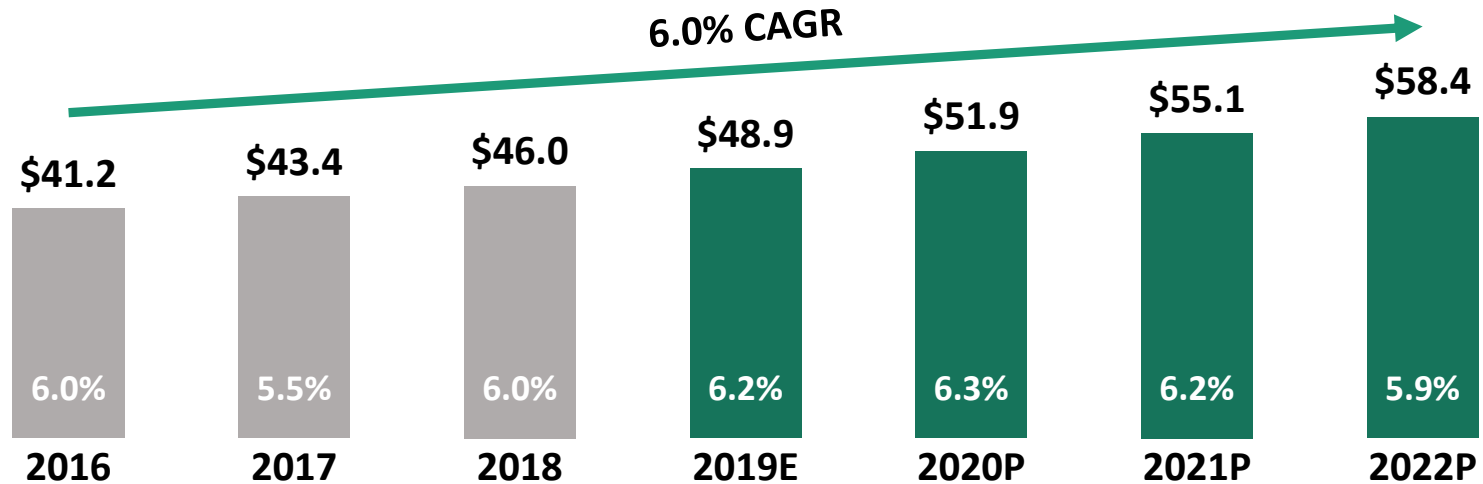
	VOLUMI			VALORI		
	ANNO TERMINANTE (milioni di confezioni)	QUOTA (%)	± % (vs 2018)	ANNO TERMINANTE (milioni di Euro)	QUOTA (%)	± % (vs 2018)
TOTALE MERCATO*	256	100	2,5	3468	100	4,3
FARMACIA	184	72	3,1	2892	83	4,9
PARAFARMACIA	20	8	-0,9	290	8	0,3
SUPER/IPER NO CORNER	37	14	3,6	172	5	3,4
SUPER/IPER CORNER	15	6	-1,6	114	3	0,1

*gli integratori erballi hanno rappresentato circa il 50% del valore totale del comparto

Fonte: Elaborazione dati IQVIA SOLUTIONS Italy

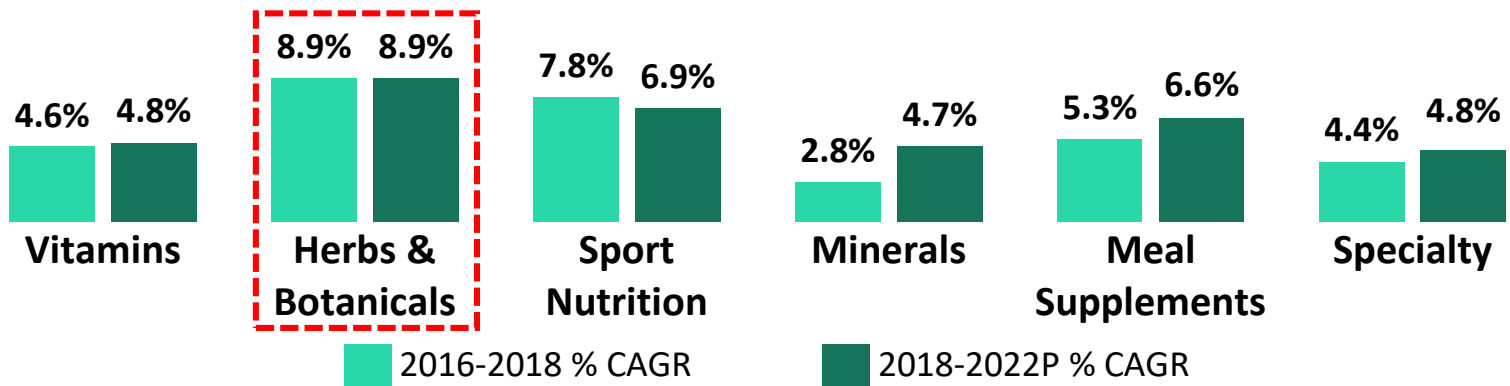
U.S. Supplement Sales

(\$ in billions, % growth)



U.S. Supplement Growth by End Market

Herbs & Botanicals is the strongest performing category and is projected to maintain its current growth trajectory at an 8.9% CAGR from 2018-2022P



Herbal Supplement Sales in US Increase by 9.4% in 2018

Record growth driven by sales of CBD, mushrooms, and immune-health products

By Tyler Smith,^a Michelle Gillespie,^b Veronica Eckl,^b Jake Knepper,^b and Claire Morton Reynolds^c

^a American Botanical Council; Austin, Texas

^b SPINS; Chicago, Illinois

^c *Nutrition Business Journal*; Boulder, Colorado

Herbal supplement sales in the United States experienced record growth in 2018, increasing by an estimated 9.4% from 2017, according to the *Nutrition Business Journal* (NBJ). Consumers spent a total of \$8.842 billion on herbal supplements across all market channels in 2018 — an increase of roughly \$757 million in sales from the previous year. This marks the strongest US sales growth of herbal supplements since 1998.¹

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Table 1. Total US Retail Sales of Herbal Supplements*

Year	Total Sales	% Change
2018	\$8.842 billion	9.4%
2017	\$8.085 billion	8.5%
2016	\$7.452 billion	7.7%
2015	\$6.922 billion	7.5%
2014	\$6.441 billion	6.8%
2013	\$6.033 billion	7.9%
2012	\$5.593 billion	5.5%
2011	\$5.302 billion	4.5%
2010	\$5.049 billion	3.3%
2009	\$5.037 billion	5.0%
2008	\$4.800 billion	1.0%
2007	\$4.756 billion	4.4%
2006	\$4.558 billion	4.1%
2005	\$4.378 billion	2.1%
2004	\$4.288 billion	3.4%
2003	\$4.146 billion	-2.3%
2002	\$4.275 billion	-2.8%
2001	\$4.361 billion	3.2%
2000	\$4.225 billion	2.9%

Source: *Nutrition Business Journal*

* Includes sales in all channels. NBJ primary research includes NBJ surveys of supplement manufacturers, distributors, multilevel marketing firms, mail order, internet, and raw material and ingredient supply companies, as well as interviews with major retailers (Walmart, Costco, etc.), manufacturers, suppliers, and industry experts. Secondary sources include IRI, SPINSscan Natural, Nielsen, *Natural Foods Merchandiser*, Insight, The Hartman Group, company data, and other published material.

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Table 4. Top-Selling Herbal Supplements in 2018 — US Mainstream Multi-Outlet Channel

Rank	Primary Ingredient	Latin Binomial	Total Sales	% Change from 2017
1	Horehound	<i>Marrubium vulgare</i>	\$146,624,255	4.1%
2	Echinacea ^a	<i>Echinacea</i> spp.	\$110,331,569	15.1%
3	Turmeric ^b	<i>Curcuma longa</i>	\$93,312,677	30.5%
4	Elderberry	<i>Sambucus nigra</i>	\$50,979,669	138.4%
5	Green tea	<i>Camellia sinensis</i>	\$45,160,552	14.2%
6	Ginger	<i>Zingiber officinale</i>	\$38,714,413	2.0%
7	Ivy leaf	<i>Hedera helix</i>	\$37,838,209	10.8%
8	Garlic	<i>Allium sativum</i>	\$37,723,155	-0.1%
9	Fenugreek	<i>Trigonella foenum-graecum</i>	\$32,498,548	9.2%
10	Black cohosh	<i>Actaea racemosa</i>	\$31,673,127	-6.0%

^a Includes three *Echinacea* species: *E. angustifolia*, *E. pallida*, and *E. purpurea*.

^b Includes standardized turmeric extracts with high levels of curcumin.

^c Excludes over-the-counter laxative drugs containing senna or sennosides.

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Table 5. Top-Selling Herbal Supplements in 2018 — US Natural Channel

Rank	Primary Ingredient	Latin Binomial	Total Sales	% Change from 2017
1	Cannabidiol (CBD)	<i>Cannabis</i> spp.	\$52,708,488	332.8%
2	Turmeric ^a	<i>Curcuma longa</i>	\$51,213,502	0.4%
3	Elderberry	<i>Sambucus nigra</i>	\$25,374,666	93.9%
4	Wheatgrass / Barley grass	<i>Triticum aestivum</i> / <i>Hordeum vulgare</i>	\$19,484,470	-3.3%
5	Flax seed / Flax oil	<i>Linum usitatissimum</i>	\$13,903,851	-7.5%
6	Aloe vera	<i>Aloe vera</i>	\$13,788,574	-1.0%
7	Ashwagandha	<i>Withania somnifera</i>	\$12,426,468	16.9%
8	Milk thistle	<i>Silybum marianum</i>	\$10,419,926	3.5%
9	Echinacea ^b	<i>Echinacea</i> spp.	\$9,979,769	11.0%
10	Oregano ^c	<i>Origanum vulgare</i>	\$9,925,727	9.9%

^a Includes standardized turmeric extracts with high levels of curcumin.

^b Includes three *Echinacea* species: *E. angustifolia*, *E. pallida*, and *E. purpurea*.

^c Includes products labeled as containing oregano oil and oregano leaf tinctures.

**COMPETENZA
BOTANICA**

GACP

Piantagioni

Micropropagazione

Biodiversità

Aree dedicate

cGMP

Estrazione

**SCALAGGIO
E
PRODUZIONE
INDUSTRIALE**

Purificazione

Isolamento

I PILASTRI DI INDENA

Più di **90** anni di storia
fondati su 4 “pilastri”

Maggiori e continue attenzioni
alla **sostenibilità**
ed all'**impatto ambientale**

RICERCA

Clinica

Processi

Screening

Pre-clinica

Prodotti

OECD

ICH

HACCP

FDA

**QUALITÀ,
SICUREZZA
ED
EFFICACIA**

ANSM

AIFA

A RESEARCH BASED COMPANY - SETTALA

Process Research: design, optimization and scaling up of advanced industrial manufacturing processes

Analytical Research: design, optimization and validation of methods for complex mixtures



A RESEARCH BASED COMPANY - MILANO

Formulative Research: design, optimization and scaling up of botanical ingredients formulations

Product Research: discovery and development of new active products derived from plants for **health & nutrition (H&N)**, pharmaceuticals and cosmetics



More than 120 patent families and 700 scientific papers

INDENA RESEARCH MISSION IN H&N



Indena R&D focus is to identify **phytonutrients**
provided with a **solid scientific background**
and to develop these ingredients by **optimizing**
their biological benefits for improving **quality of life**

INDENA RESEARCH APPROACH IN H&N



EXTRACTS FROM **EDIBLE**
OR MEDICINAL **PLANTS**

MOLECULES FROM **EDIBLE**
OR MEDICINAL **PLANTS**

FORMULATION
DEVELOPMENT

MoA, PHARMACOLOGY,
PK, PoC IN HUMANS

RECENT INDENA RESEARCH DEVELOPMENT IN H&N



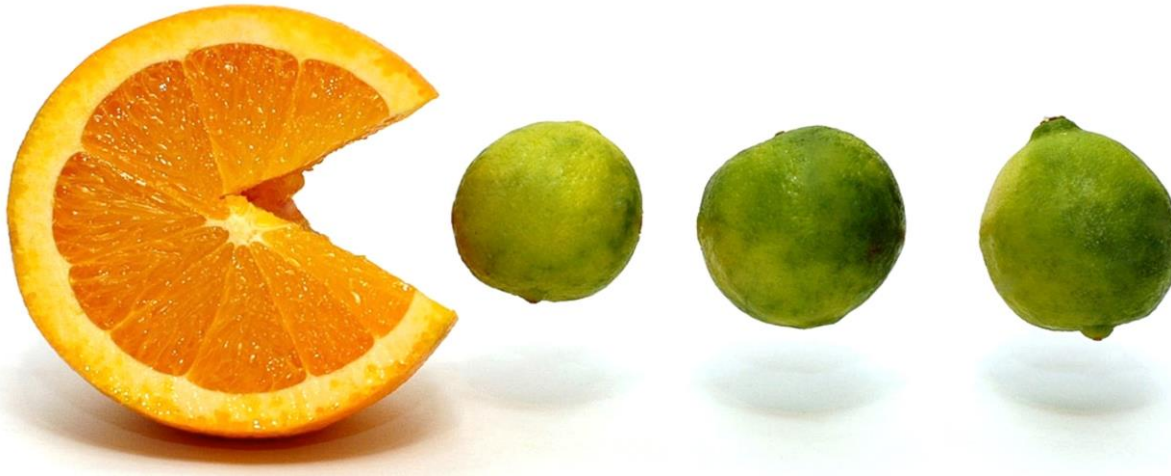
Focus on plants that:

- are traditionally used as food (edible plants)
- can benefit from the use of proprietary extraction and formulation technologies

RECENT INDENA RESEARCH DEVELOPMENT IN H&N

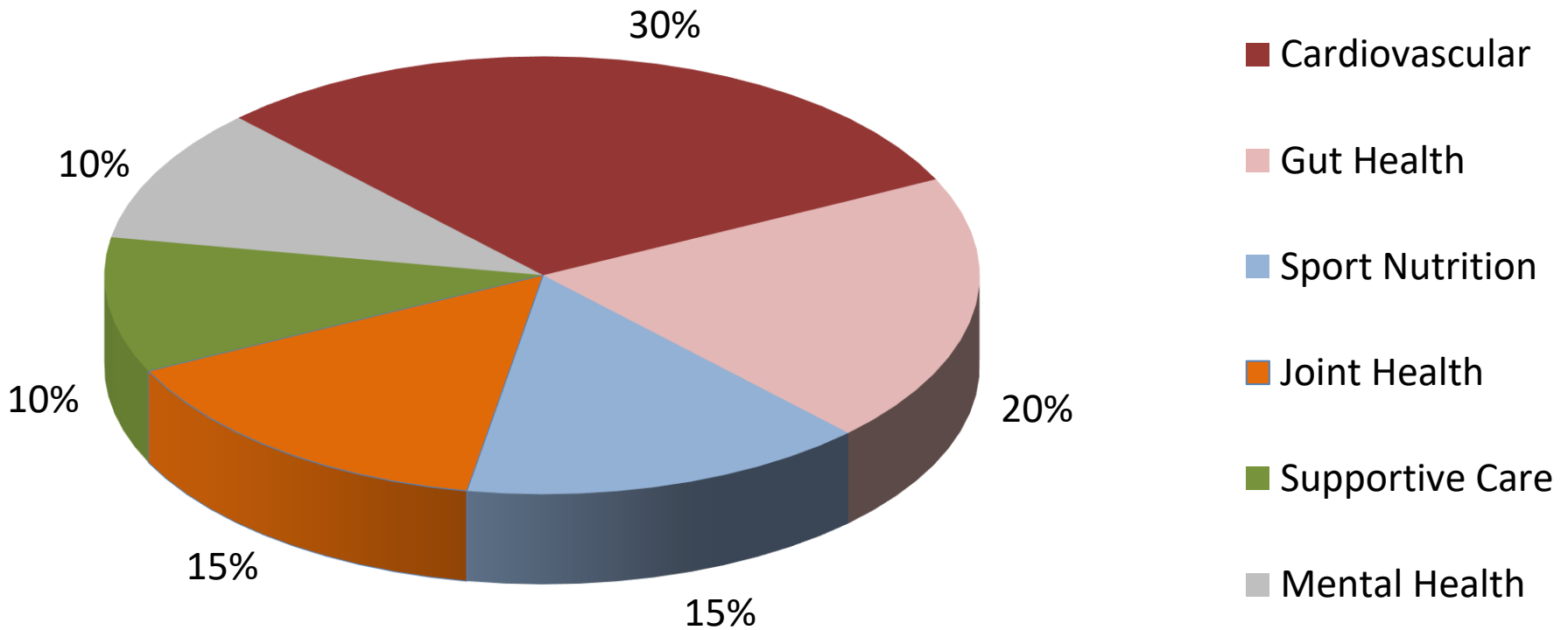


Main reasons for focusing on edible plants:



- **Safe use** tradition, rediscovery of ancient varieties
- **Epidemiological** data linked to the consumption of a food
- **Basic biomedical evidence** for specific constituents

INDENA RESEARCH IN H&N: AREAS



INDENA RESEARCH IN H&N: ENDPOINTS

CARDIOVASCULAR	Blood glucose Cholesterol Blood pressure
GUT HEALTH	Functional dyspepsia IBS/IBD Microbiota
MENTAL HEALTH	Cognitive decline
SPORT NUTRITION	Healthy inflammation Performance Recovery
JOINT HEALTH	Inflammation Pain Cartilage
SUPPORTIVE CARE (ONCOLOGY)	Supportive care Chemoprevention

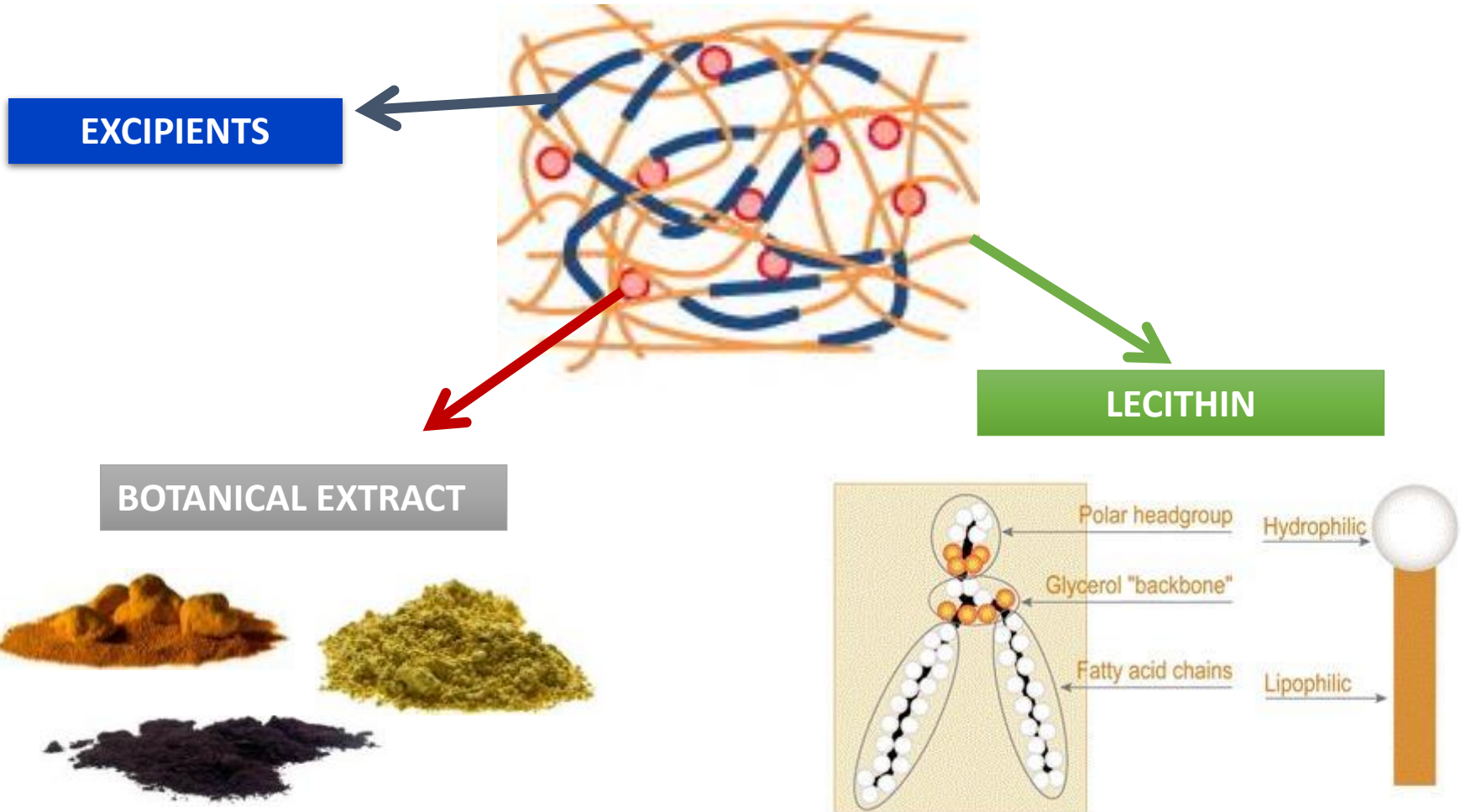
INDENA RESEARCH IN H&N: EXAMPLES OF RECENT INGREDIENTS LAUNCHED WORLDWIDE

CARDIOVASCULAR	Vazguard™ (Bergamot phytosome®)
GUT HEALTH	Casperome® (Boswellia phytosome®)
SPORT NUTRITION	Quercefit™ (Quercetin phytosome®)
JOINT HEALTH (INFLAMMATION)	Meriva® (Turmeric phytosome®)

Phytosome[®] technology

WHAT IS A PHYTOSOME®?

In that contest Phytosome® was born as a dispersion of botanicals into lecithin, a dietary surfactant in typical ratio BNs/lecithin from 1:1 to 1:3

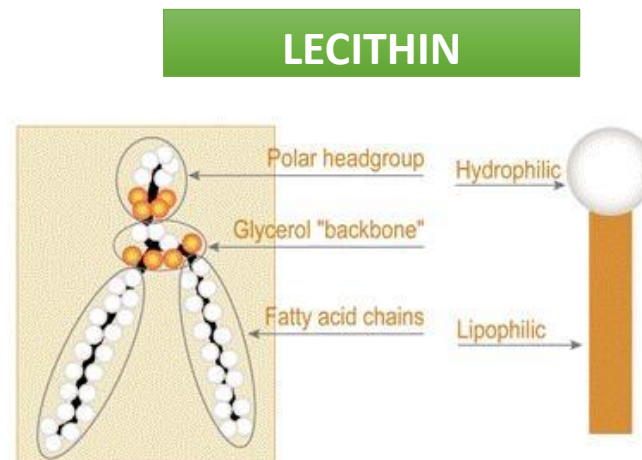


HOW DOES PHYTOSOME[®] WORK?

Lecithin is an amphipatic molecule consisting of a positively charged head group and two neutral tail acyl moieties.

The presence of « ultra-interacting » moieties makes lecithin an *inhibitor of self-aggregation*, dispersing sparingly soluble compounds into a sort of solid-state emulsion.

Lecithin is poorly soluble in water, but is readily absorbed e.g. from the intestine, leaving phytochemicals into a dispersed state more readily absorbed.



PHYTOSOME®: SOME EXAMPLES OF A SUCCESSFUL STORY (1)



NAME	BOTANICAL ORIGIN	BIOLOGICAL ACTIVITY
UBIQSOME® COENZYME Q10 PHYTOSOME®		Sport nutrition
REXATROL® RESVERATROL PHYTOSOME®	<i>Polygonum cuspidatum</i> Sieb. et Zucc. - Rhizome	Antioxidant activity, Antiageing, Sirt 1 modulator
CENTELLA ASIATICA SELECTED TRITERPENES PHYTOSOME®	<i>Centella asiatica</i> (L.) Urban - Leaf	Collagen restructurant, Antiwrinkles agent
GINKGOSELECT® PHYTOSOME® GINKGO BILOBA PHYTOSOME®	<i>Ginkgo biloba</i> L. - Leaf	Cognition and circulation improver, Antioxidant activity, Vasokinetic
VIRTIVA® - GINKGO BILOBA PHOSPHATIDYLSERINE PHYTOSOME®	<i>Ginkgo biloba</i> L. - Leaf	Cognitive enhancer
GINSELECT® PHYTOSOME® GINSENG IDB PHYTOSOME®	<i>Panax ginseng</i> C.A. Meyer - Root	Adaptogen, Tonic, Skin elasticity improver
MERIVA® TURMERIC PHYTOSOME®	<i>Curcuma longa</i> L. - Rhizome	Joint health, Healthy inflammatory response, Soothing

PHYTOSOME®: SOME EXAMPLES OF A SUCCESSFUL STORY (2)



NAME	BOTANICAL ORIGIN	BIOLOGICAL ACTIVITY
CASPEROME® BOSWELLIA PHYTOSOME®	<i>Boswellia serrata</i> Roxb. ex Colebr. - Resin	Healthy inflammatory response
GREENSELECT® PHYTOSOME GREEN TEA PHYTOSOME®	<i>Camellia sinensis</i> (L.) O. Kuntze - Young leaf	Antioxidant activity, Weight loss agent
LEUCOSELECT® PHYTOSOME® GRAPE SEED PHYTOSOME®	<i>Vitis vinifera</i> L. - Seed	Healthy cardiovascular function, UV protectant, Antioxidant activity
SILYMARIN PHYTOSOME®	<i>Silybum marianum</i> (L.) Gaertn. - Fruit	Healthy liver, Antioxidant activity, UV protectant
SILIPHOS® SILYBIN PHYTOSOME®	<i>Silybum marianum</i> (L.) Gaertn. - Fruit	Healthy liver
QUERCEFIT™ QUERCETIN PHYTOSOME®	<i>Sophora Japonica</i> - Flower buds	Sport Nutrition
VAZGUARD™ BERGAMOT PHYTOSOME®	<i>Citrus Bergamia</i> Risso & Poiteau - Juice	Cardiovascular

vazguard™



**THE NEW NATURAL INGREDIENT
FOR
CARDIOVASCULAR HEALTH**

WHAT IS VAZGUARD™?




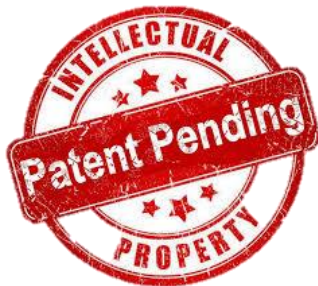
VAZGUARD™ is the **innovative purified Bergamot Polyphenols Fraction (BPF®)** formulated with Indena Phytosome® technology to **improve bioavailability** and optimize biological absorption of bergamot polyphenols.

VAZGUARD™ is a new **patented** and **standardized** delivery system of bergamot polyphenols proven to be effective in **supporting cardiovascular health**.

BERGAMOT PHYTOSOME® COMPOSITION



	
BPF® EXTRACT <i>(Total Flavanones by HPLC)</i>	40 % <i>(11-19%)</i>
SUNFLOWER LECITHIN	about 50%
FOOD GRADE EXCIPIENTS <i>(Maltodextrins, Silicon Dioxide)</i>	about 10% <i>(8%, 2%)</i>
<i>SOLVENT: ETHANOL</i>	
<i>RECOMMENDED DOSAGE: 500 mg TWICE A DAY</i>	



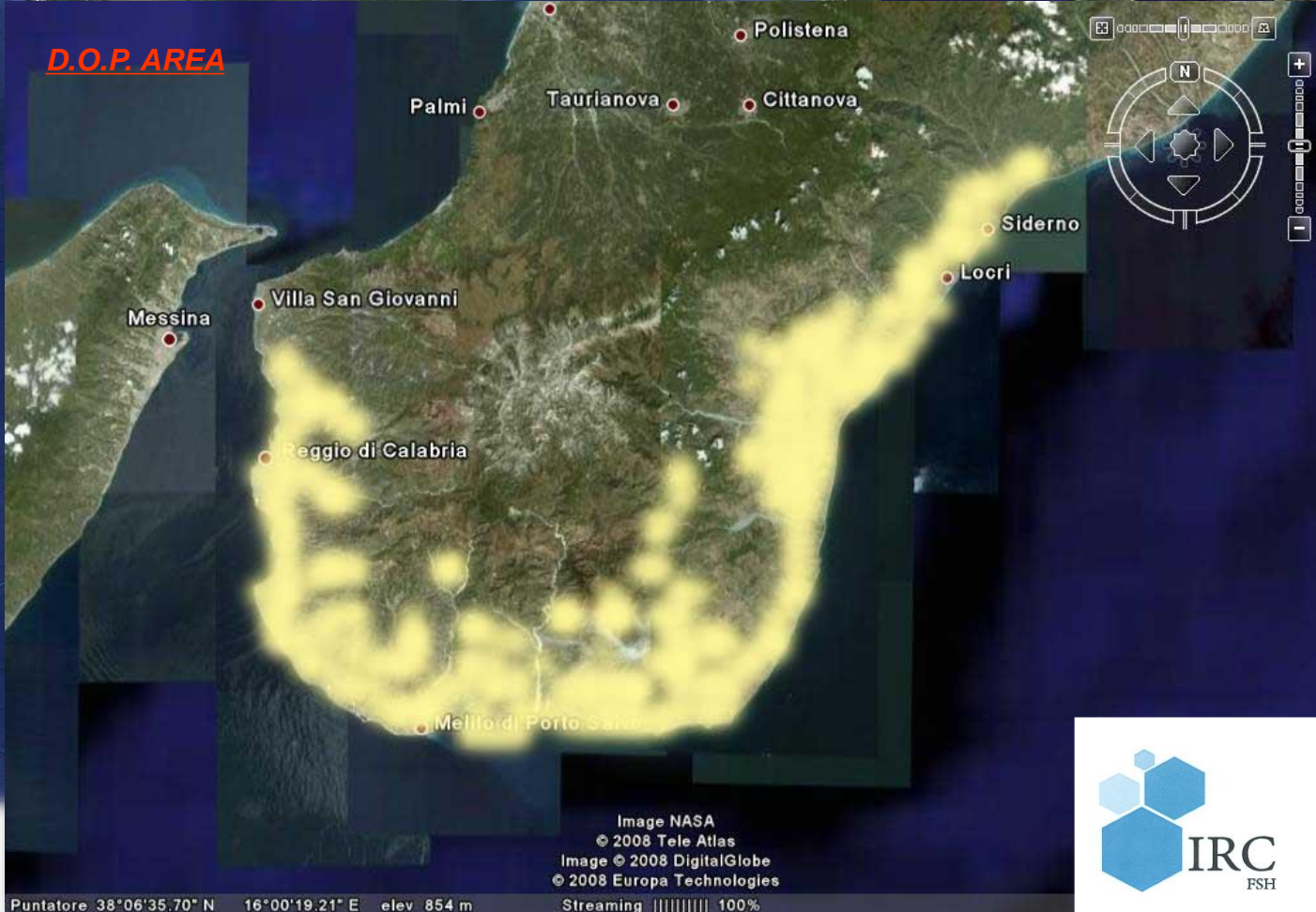


**BERGAMOT EXTRACT
SUPPLY CHAIN**

CULTIVATIONS OF *CITRUS BERGAMIA* RISSO & POITEAU CALABRIA, ITALY - **THE UNIQUE SOURCE**



THE UNIQUE SOURCE



Puntatore 38°06'35.70" N 16°00'19.21" E elev 854 m

Image NASA
© 2008 Tele Atlas
Image © 2008 DigitalGlobe
© 2008 Europa Technologies

Streaming ||||| 100%



UNIQUE CONTROLLED SUPPLY-CHAIN CALABRIA (ITALY)



Bergamot supply-chain is under direct and continuous quality control by Indena:

- Indena's Audit in order to ensure improved traceability of source, extraction, manufacturing
- The *Declaration of Authenticity* of BERGAMOT POLYPHENOL FRACTION (BPF®) by H&AD srl (RC, Italy) is available

PHYTOCHEMICAL CHARACTERIZATION


JOURNAL OF
AGRICULTURAL AND
FOOD CHEMISTRY

Article

Cite This: *J. Agric. Food Chem.* 2019, 67, 3159–3167


pubs.acs.org/JAFC

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 Taglialatela-Scafati^{*,†} 

[†]Department of Pharmacy, School of Medicine and Surgery, University of Naples Federico II, Via D. Montesano 49, 80131 Naples, Italy

[‡]INDENA SpA, Via Don Minzoni 6, 20090 Settala, Milan, Italy


 Supporting Information

ABSTRACT: Bergamot (*Citrus bergamia*) is cultivated in Southern Italy almost exclusively to produce the prized essential oil, a top note in several perfumes. The juice of bergamot, until recently poorly studied, is the object of a growing scientific interest due to its claimed activity to treat metabolic syndrome. The aim of this investigation was a detailed characterization of bergamot juice polyphenolic fraction (BPF) based on a UPLC-DAD-MS analysis complemented by preparative chromatographic separations, followed by NMR characterization of the isolated compounds. The combination of these techniques efficiently covered different classes of secondary metabolites, leading to the identification of 39 components, several of which had never been reported from bergamot. One of them, bergamjuicin (**35**), is a new flavanone glycoside, whose structure has been determined by MS and NMR techniques. The reported results could provide a guide for future routine analyses of BPF, a material of great nutraceutical and industrial interest.

KEYWORDS: *Citrus bergamia*, bergamot polyphenolic fraction, NMR analysis, flavanones, limonoids, metabolic syndrome

BPF[®] EXTRACT

UNIQUE PHYTOCHEMICAL PROFILE



BPF[®] phytochemical profile has been extensively studied and characterized by Indena

BPF[®] is characterized by a **unique** phytochemical profile in terms of both flavonoids *composition* and *content*

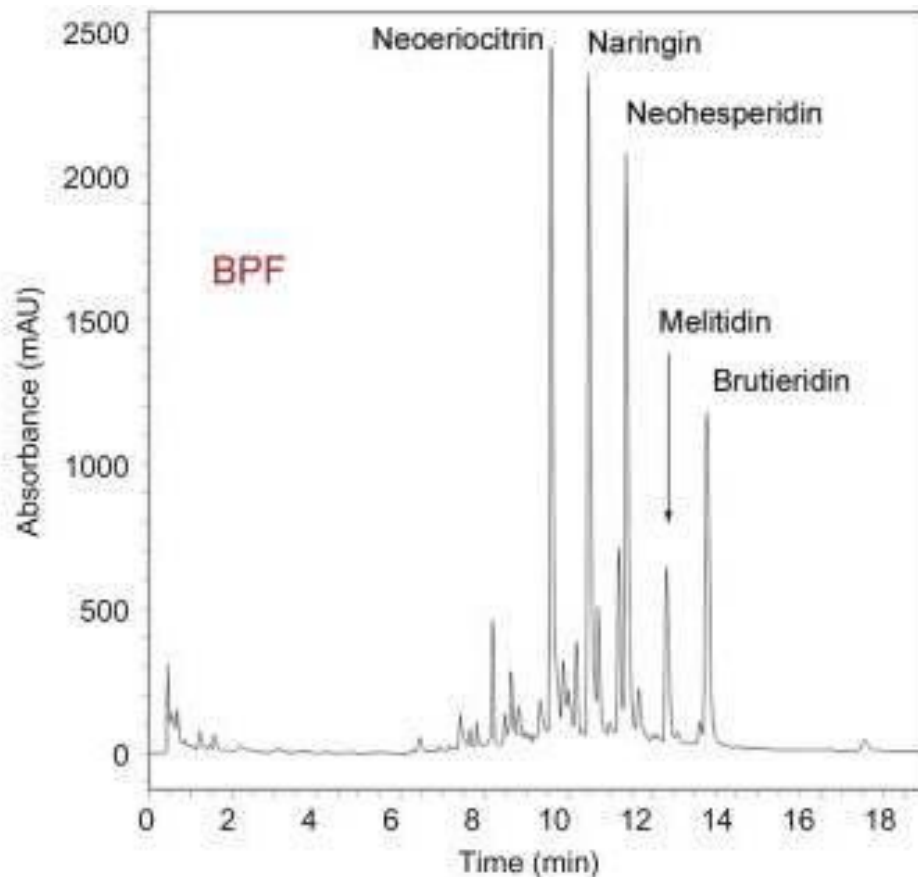
BPF[®] has the same phytochemical profile of natural **bergamot juice**

BPF[®] distances itself from all other bergamot extracts on the market

BPF[®] EXTRACT

PHYTOCHEMICAL CHARACTERIZATION

BERGAMOT POLYPHENOL FRACTION (BPF[®]) composition



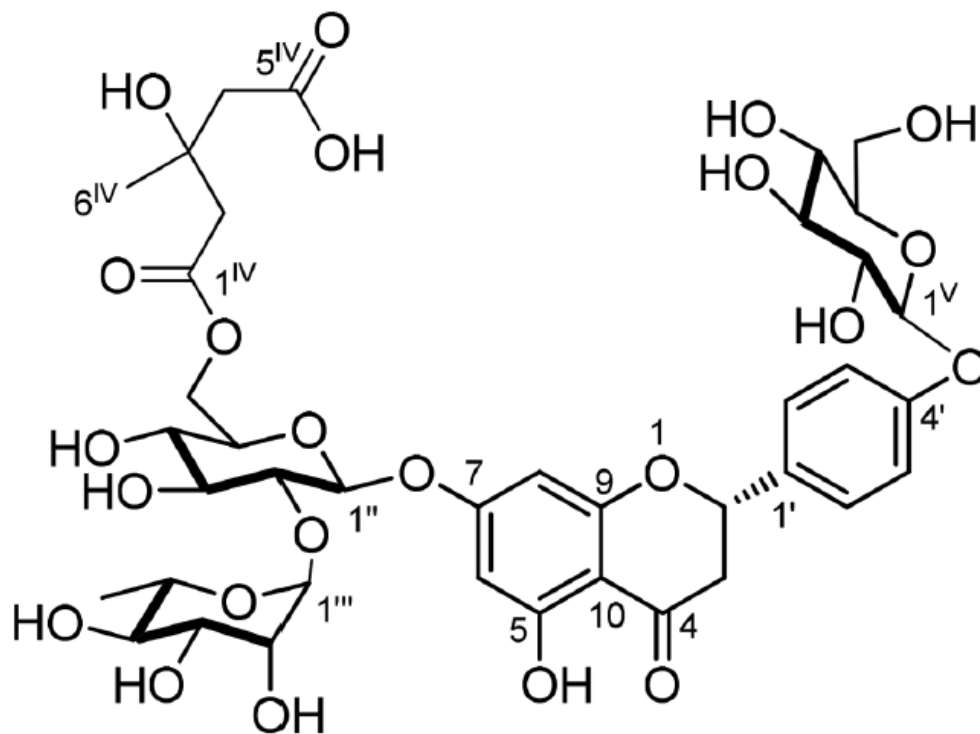
1. High content of flavanones:
the main flavonoids of BPF[®] are **naringin**, **neohesperidin** and **neohesperidin**.
2. Exclusive content of statin-like glycosidic flavonoids: **melitidin** and **brutieridin**.
3. Other flavones are: **rutin**, **neodiosmin**, **rhoifolin**, **poncirin**.
4. Presence of ascorbic acid and other vitamins.

BPF[®] EXTRACT

PHYTOCHEMICAL CHARACTERIZATION

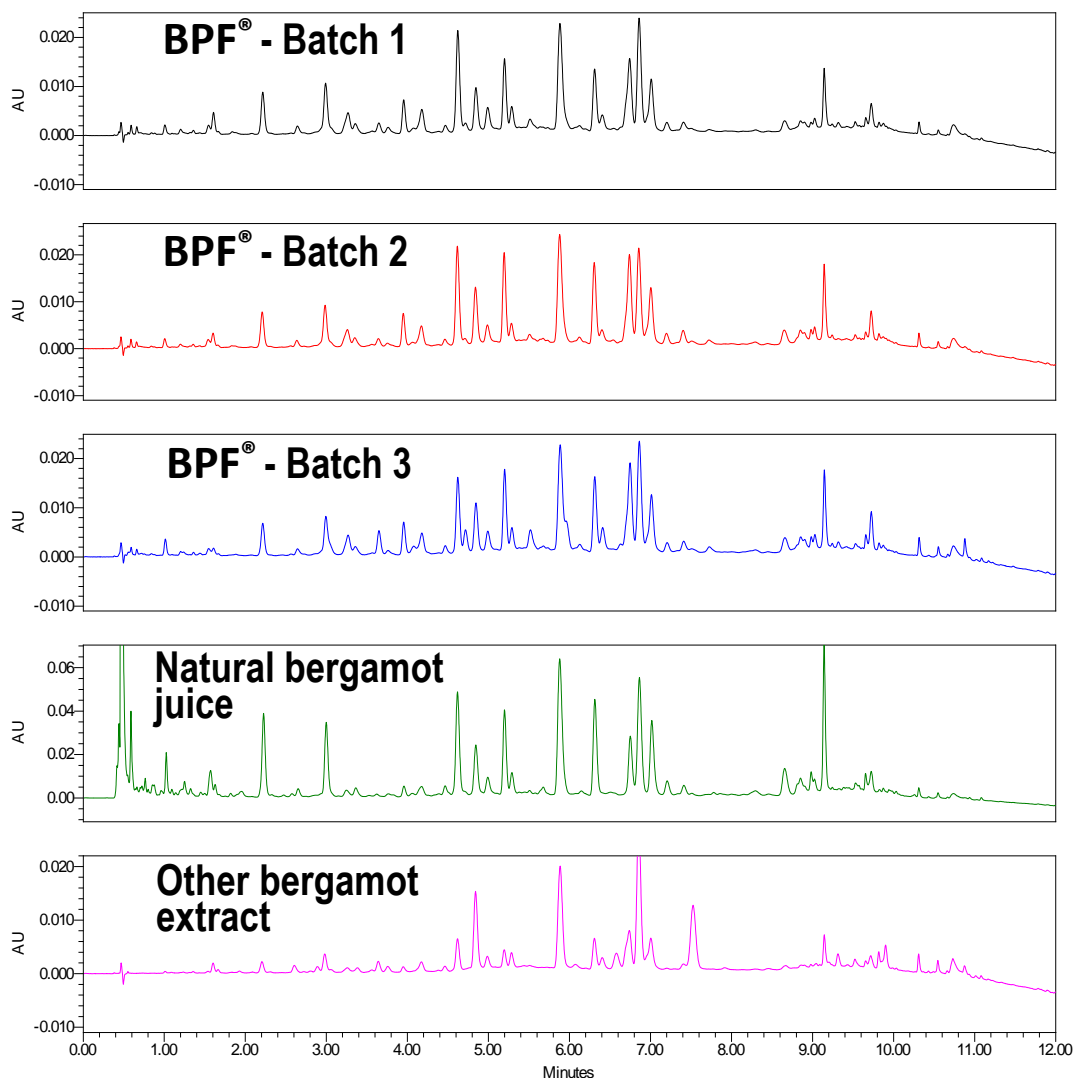
(A NEW FLAVANON IDENTIFIED)

J. Agric. Food Chem. 2019, 67, 3159–3167



Bergamjuicin

SAME PHYTOCHEMICAL PROFILE AS NATURAL JUICE



HPLC Profile comparison
(@254 nm) between:

- 3 BPF® batches
- 1 Natural bergamot juice
- 1 Bergamot extract competitor's batch

**HIGH REPRODUCIBILITY
AMONG DIFFERENT
BPF® BATCHES**

**BPF® HAS SAME PROFILE
OF NATURAL JUICE**

VAZGUARD™:

THE SCIENTIFIC RATIONALE

Active components of Bergamot (BPF® flavonoids)
are characterized by low bioavailability



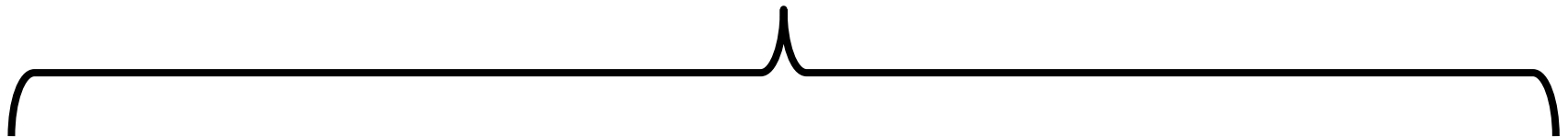
Necessity to consolidate the clinical benefit of bergamot
with a **more efficient formulation** and **lower dosages**



BERGAMOT PHYTOSOME®



vazguard™



BPF®
BERGAMOT EXTRACT



40%



LECITHIN



50%



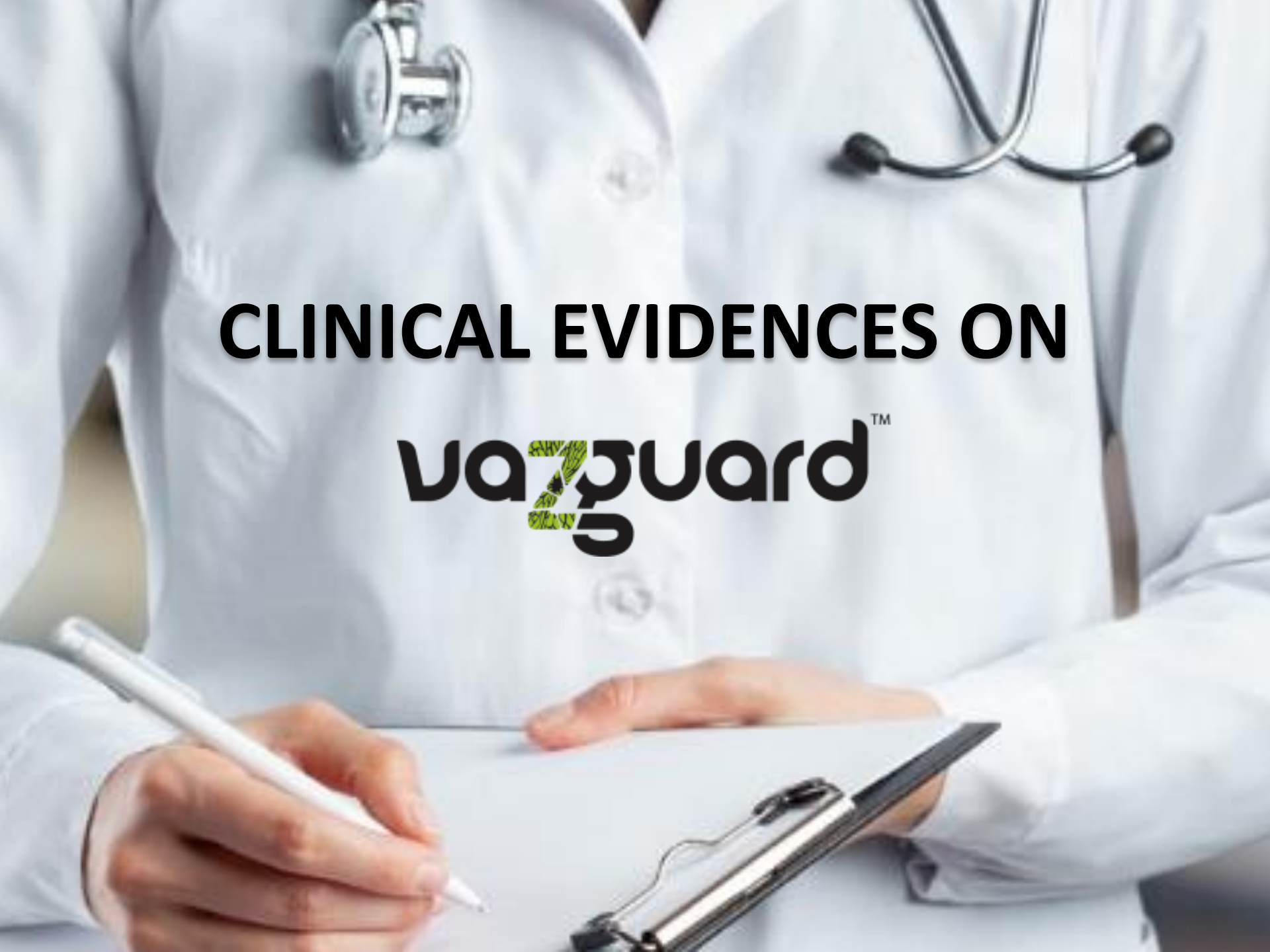
Food-grade
excipients



10%

CLINICAL EVIDENCES ON

vazguardTM

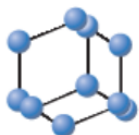




THE FIRST CLINICAL EVIDENCE OF EFFICACY

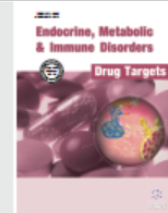
Endocrine, Metabolic & Immune Disorders - Drug Targets, 2019, 19, 136-143

RESEARCH ARTICLE



**BENTHAM
SCIENCE**

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

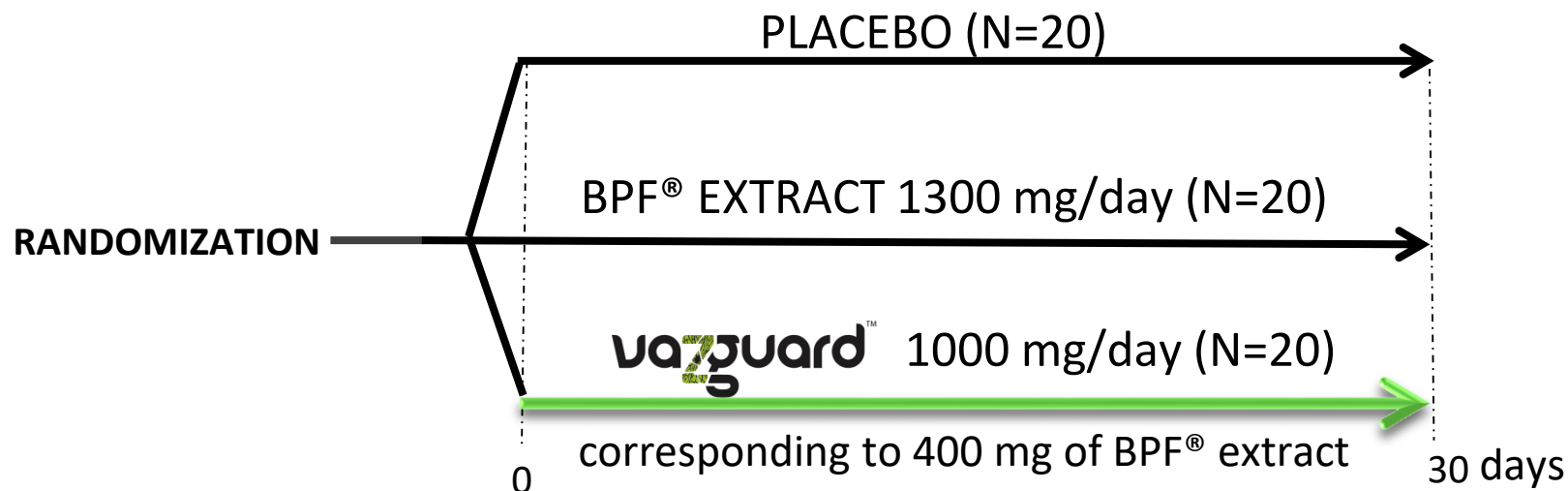


Vincenzo Mollace^{1*}, Miriam Scicchitano¹, Sara Paone¹, Francesca Casale¹, Carla Calandruccio¹, Micaela Gliozzi¹, Vincenzo Musolino¹, Cristina Carresi¹, Jessica Maiuolo¹, Saverio Nucera¹, Antonella Riva², Pietro Allegrini², Massimo Ronchi², Giovanna Petrangolini² and Ezio Bombardelli²

¹Institute of Research for Food Safety & Health (IRC-FSH), Department of Health Sciences, University "Magna Graecia" of Catanzaro, Catanzaro, Italy; ²Research and Development Unit, Indena S.p.A., Milan, Italy

ets

CLINICAL STUDY: DESIGN



- ✓ **SPONSOR:** Prof. Mollace (University of Catanzaro) and Indena S.p.A.
- ✓ **STUDY TYPE:** Double blind, randomized, placebo-controlled
- ✓ **STUDY POPULATION:** 60 subjects with dyslipidemia associated with/without hyperglycemia
- ✓ **ENDPOINTS:** total cholesterol (TC), Low-Density Lipoproteins (LDL-C), triglycerides (TG), High-Density lipoproteins (HDL-C) and blood glucose

CLINICAL STUDY: ADMINISTERED DOSAGES

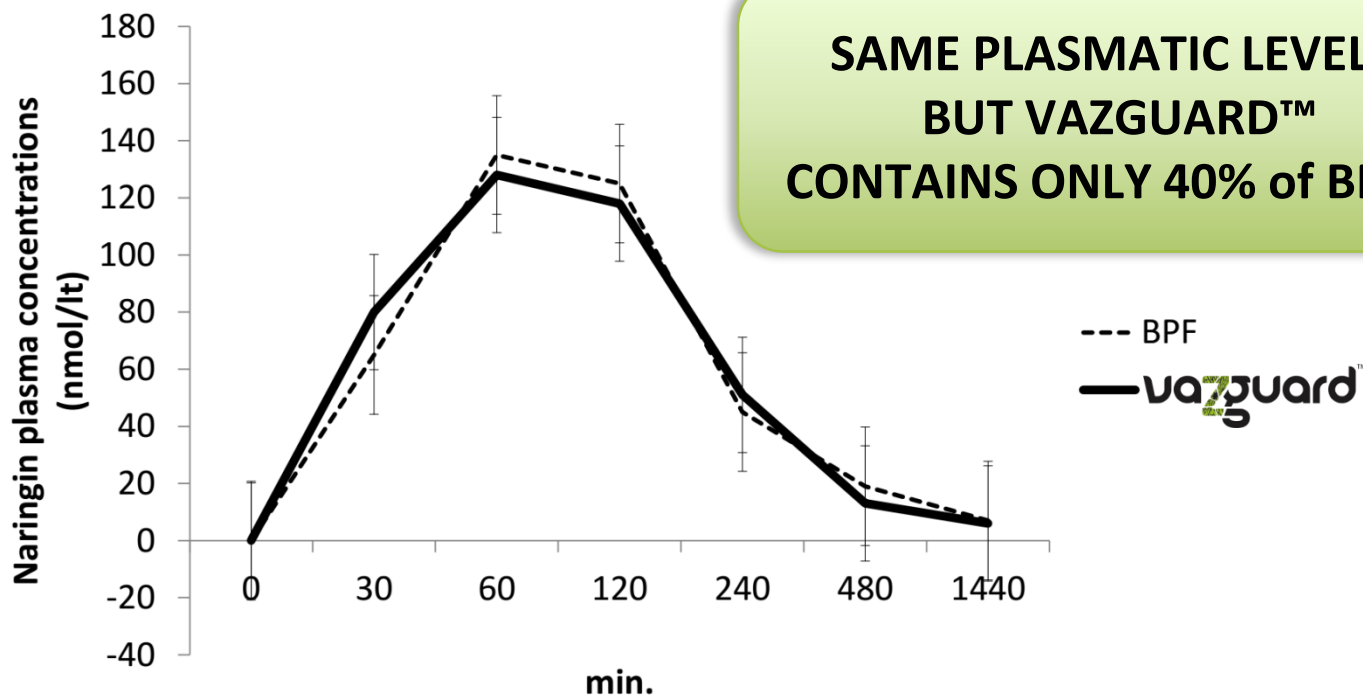


	BPF® EXTRACT	va ^{guard} ™	
DAILY DOSE (mg)	1300	1000	-30 %
DAILY DOSE <i>as</i> <i>BERGAMOT EXTRACT</i> (mg)	1300	400	-70 %

**VAZGUARD™ IS ADVANTAGEOUS COMPARED TO BPF® EXTRACT
IN TERMS OF BOTH
WEIGHT (-30%) AND EXTRACT CONTENT (-70%)**

CLINICAL STUDY: BIOAVAILABILITY IN HUMAN PLASMA

TIME VS PLASMA CONCENTRATION CURVES FOR NARINGIN AFTER RECEIVING
1300 mg OF BPF[®] EXTRACT vs **1000 mg OF VAZGUARD[™]**



**SAME PLASMATIC LEVELS,
BUT VAZGUARD[™]
CONTAINS ONLY 40% OF BPF[®]!**

Data were expressed as mean values and standard deviations (SD)

CLINICAL STUDY: MOST RELEVANT EFFECTS

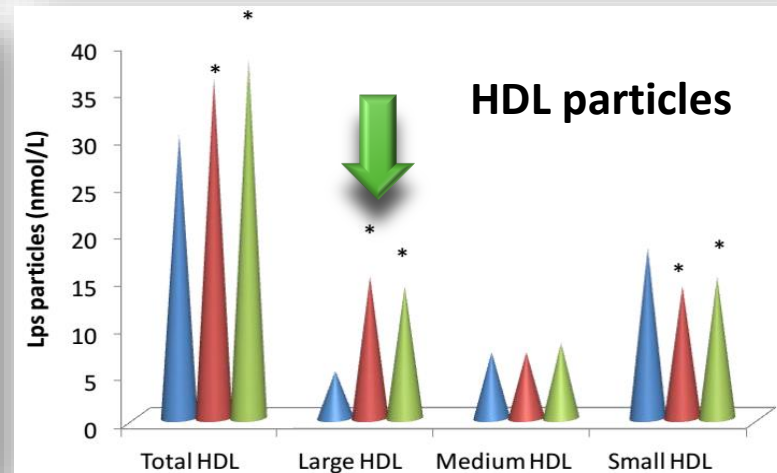
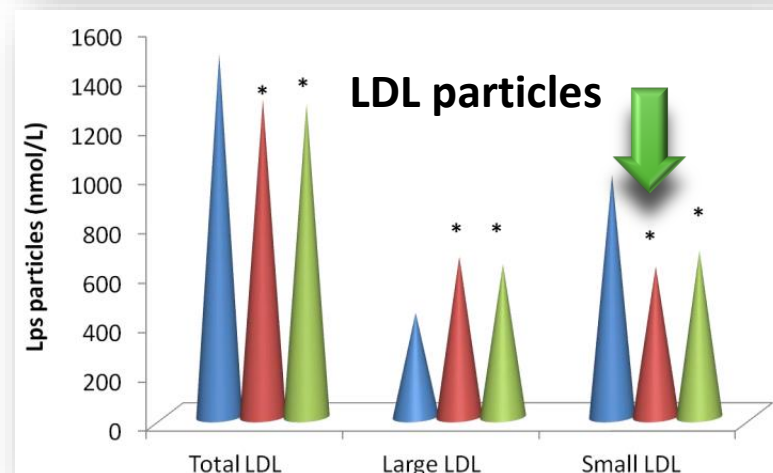
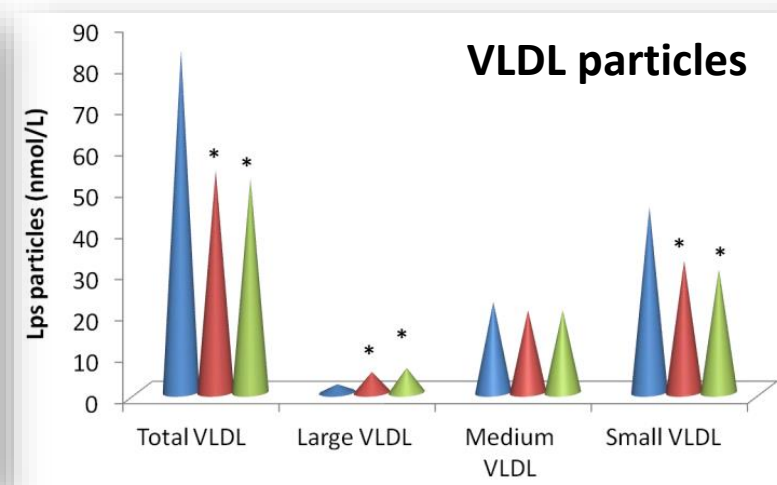
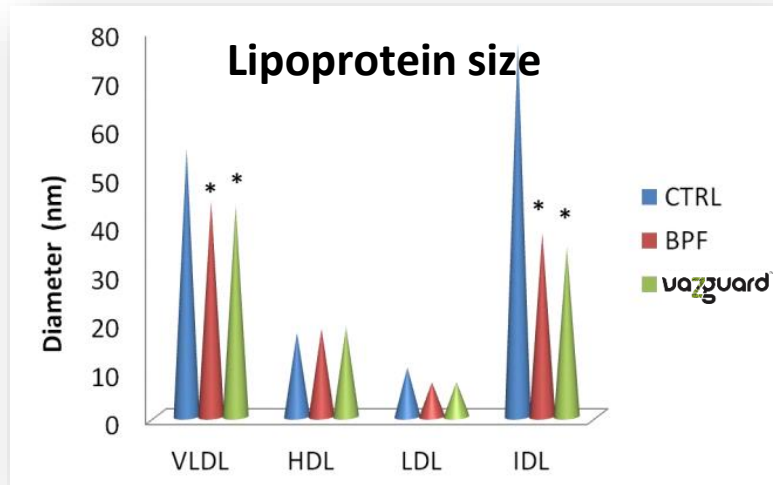
vazguard[™] 1000 mg/day

VARIATION OF GLUCIDIC AND LIPIDIC PROFILES AFTER 30 DAYS

Serum Lipids (p<0.05)	TC	- 24%
	LDL-C	- 35%
	HDL-C	+14%
	Triglycerides	- 31%
Fasting Glucose (p<0.05)		-23%

**DESPITE OF THE LOWER CONTENT OF BPF[®] EXTRACT,
VAZGUARD[™] RESULTED IN PROMISING OUTCOMES
AS SUPPORT IN CARDIOVASCULAR HEALTH**

CLINICAL STUDY: REMODULATION OF LIPOPROTEIN SIZE

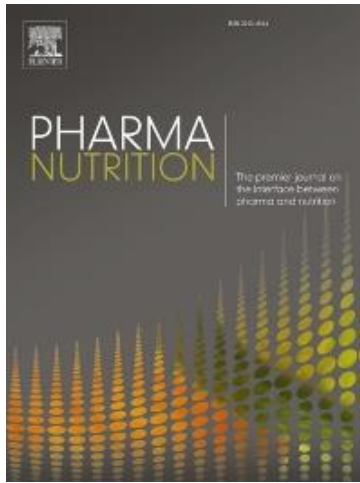




vanguard™

PLEIOTROPIC

MECHANISM OF ACTION

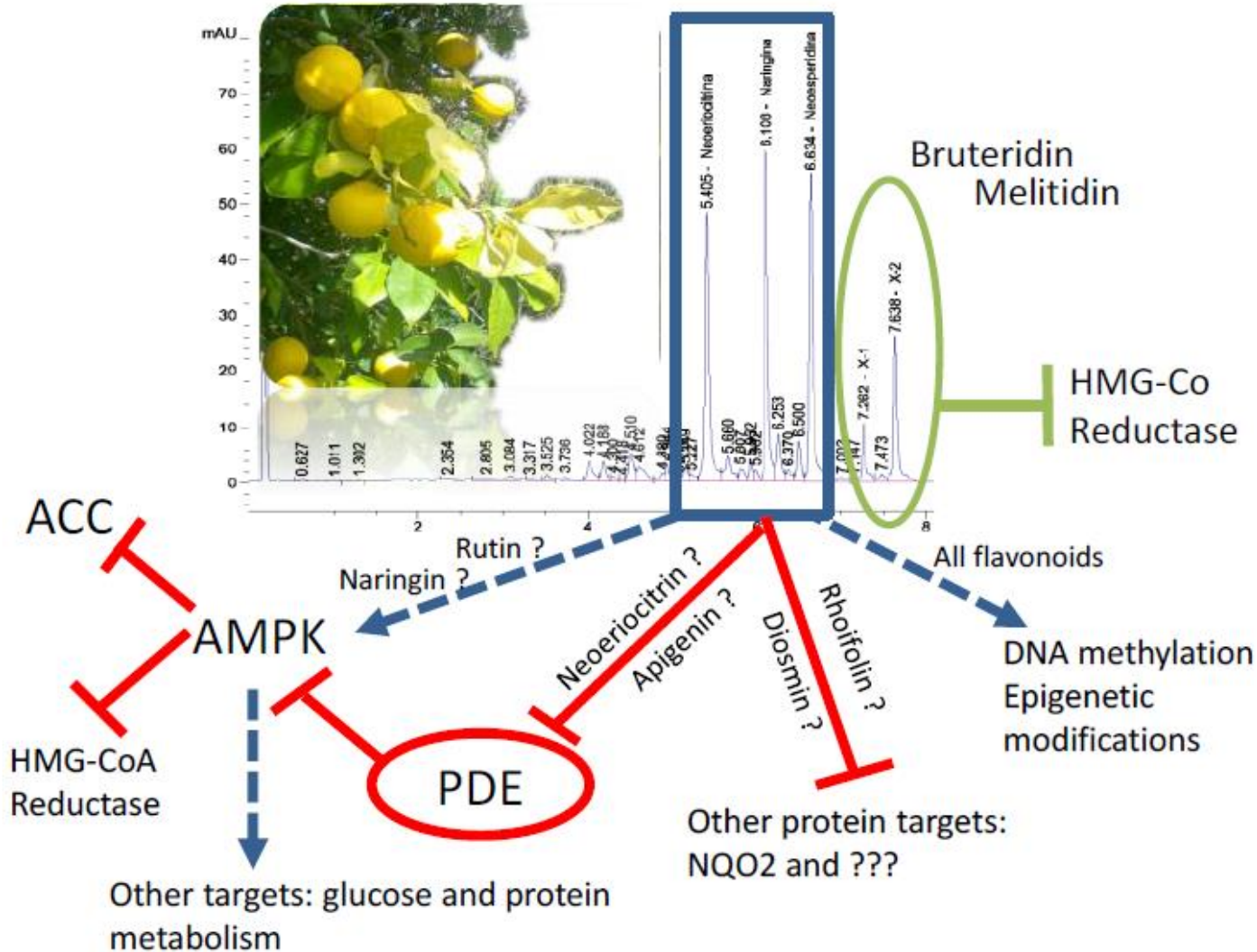


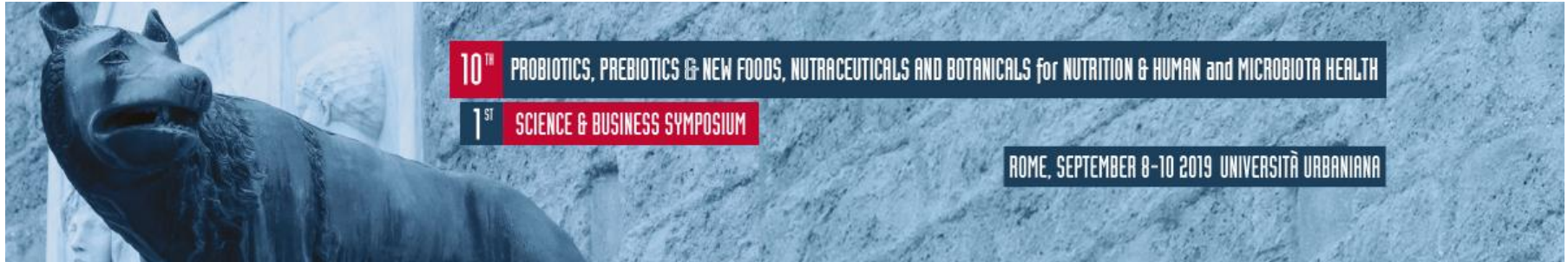
Molecular mechanisms of lipid- and glucose-lowering activities of bergamot flavonoids

Elzbieta Janda^{a,b,*}, Antonella Lascala^{a,b}, Concetta Martino^{a,b}, Salvatore Ragusa^b, Saverio Nucera^{a,b}, Ross Walker^{a,c}, Santo Gratteri^a and Vincenzo Mollace^{a,b}

^a Institute of Research for Food Safety & Health (IRC-FSH), ^bHealth Sciences Department, University “Magna Graecia”, Campus Germaneto, Catanzaro, Italy; ^c Sydney Adventist Hospital, Sydney, Australia

Innovative and pleiotropic MoA at the base of lipid- and glucose-lowering effects





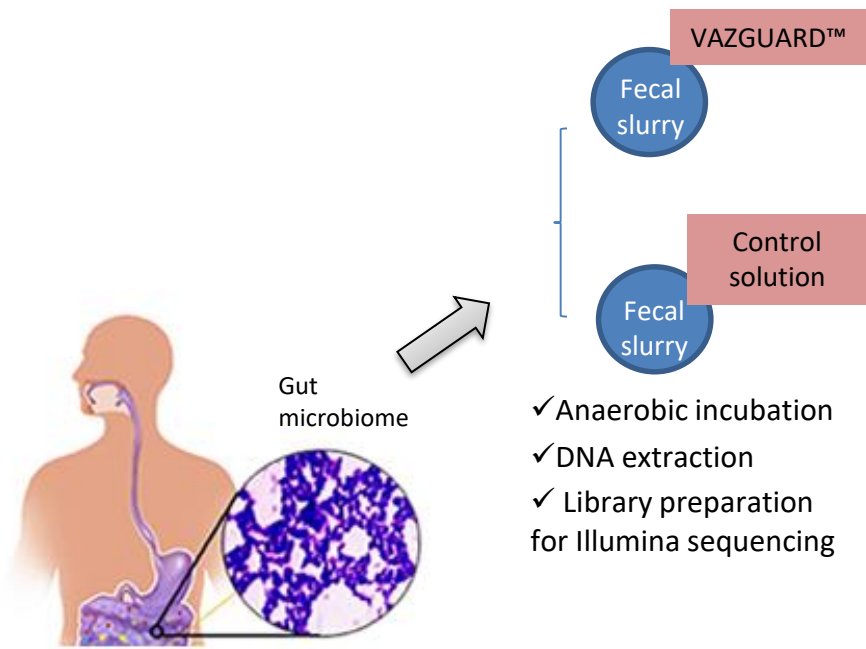
ADDITIONAL AND RECENT EVIDENCES

ON MoA:

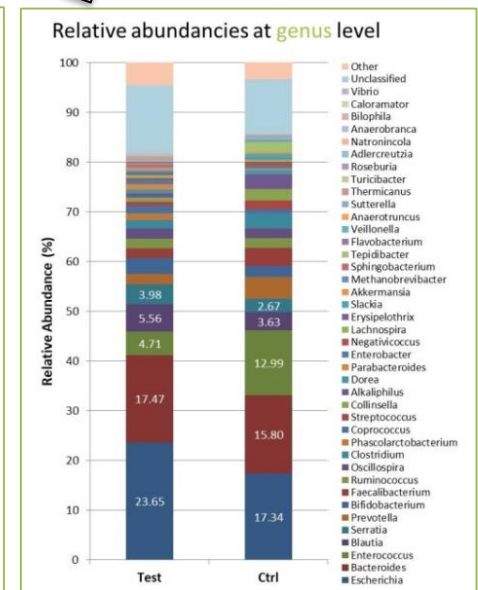
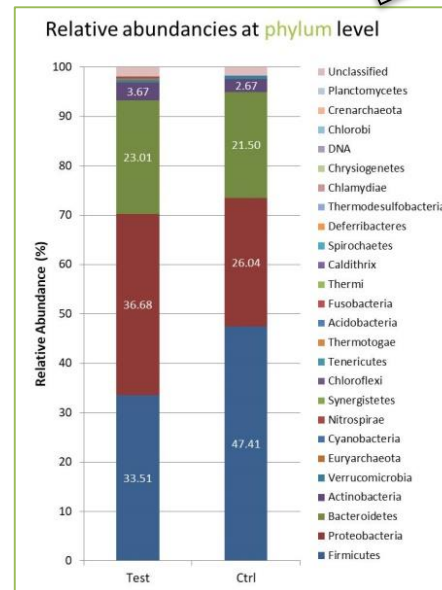
MODULATION OF MICROBIOTA

MICROBIOME DIVERSITY AFTER VAZGUARD™ TREATMENT

Experimental design: three healthy volunteers



✓ 16S Metagenomic Sequencing Analysis



MICROBIOME DIVERSITY AFTER VAZGUARD™ TREATMENT



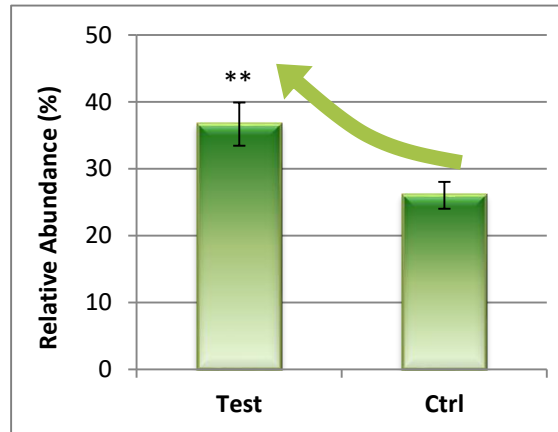
Proteobacteria decrease are associated with CVD¹

→ Increased level of Proteobacteria

25 Different **phyla** identified

4 Major phyla

- Firmicutes
- Proteobacteria
- Bacteroidetes
- Actinobacteria



** p<0.01

¹ Dinakaran et al. PLOS ONE 9(8) (2014)

Major area of interest: Obesity and CVD associated with changes in microbioma composition

418 Different **genera** identified

8 Major genera (62%)

- Escherichia
- Serratia
- Bacteroides
- Prevotella
- Enterococcus
- Bifidobacterium
- Blautia
- Faecalibacterium

Area of interest	Taxonomy level	Name	Disease Outcome	VAZGUARD™ Outcome
CVD	Genus	<i>Bacteroides</i>	↓	↑
	Genus	<i>Eubacterium</i>	↓	↑
	Genus	<i>Streptococcus</i>	↑	↓
	Genus	<i>Collinsella</i>	↑	↓
Obesity	Genus	<i>Bifidobacterium</i>	↓	↑
	Genus	<i>Methanobrevibacter</i>	↓	↑
	Genus	<i>Blautia</i>	↓	↑
	Genus	<i>Flavobacterium</i>	↓	↑
	Genus	<i>Akkermansia</i>	↓	↑

vanguardTM IN A NUTSHELL



- ✓ *New food ingredient for cardiovascular health (Patent pending)*
- ✓ *Unique Italian origin and based on Mediterranean dietary tradition*
- ✓ *Complete control of the supply chain from fruit to Phytosome[®]*
- ✓ *Full phytochemical characterization available*
- ✓ *Same natural profile of bergamot juice*
- ✓ *Proven improved bioavailability of bergamot flavonoids*
- ✓ *Proprietary clinical evidences of efficacy in CV health*
- ✓ *Pleiotropic MoA (including evidences of positive modulation of microbiota)*

CONCLUSIVE REMARKS

- 1. H&N is a fast growing and competitive area worldwide**
- 2. In this scenario, herbal products represent a remarkable part of the market**
- 3. Respect of the International guidelines for both botanical sourcing (cGAP) and industrial development (GMP) is a pivotal aspect**
- 4. Innovation plays a strategic role for companies development and survival**
- 5. Pre-clinical and clinical documentation for safety and efficacy will play an unavoidable role**



**INDENA
TODAY**

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