

14°

CONGRESSO NAZIONALE SINut

SINut
Società Italiana di Nutraceutica

12-14 settembre 2024

Bologna



Effetti Farmacologici e Nutraceutici dell' Aglio Nero Fermentato

Maria Loreta Libero

Dipartimento di Farmacia, Università degli
Studi "G. d'Annunzio"

Chieti-Pescara

La sottoscritta Libero Maria Loreta

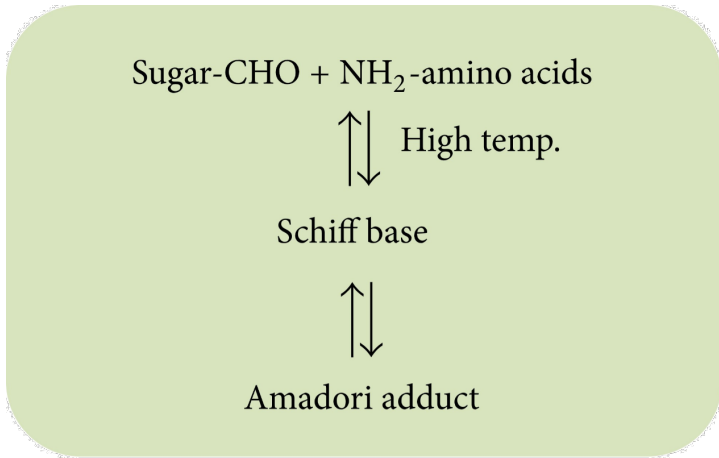
ai sensi dell'art. 3.3 sul Conflitto di Interessi, pag. 17 del Reg. Applicativo dell'Accordo Stato-Regione del 5 novembre 2009,

dichiara

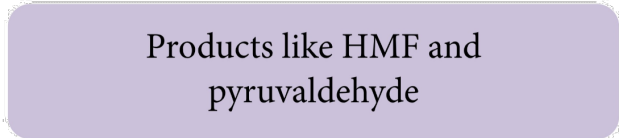
che negli ultimi due anni ha avuto rapporti diretti di finanziamento con soggetti portatori di interessi commerciali in campo sanitario:

- Difass International S.p.A., Via Ausa, 5, Loc. Cerasolo – 47853 Coriano (RN)

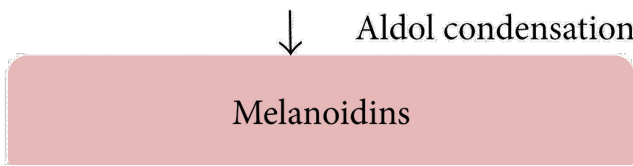
COME SI OTTIENE L'AGLIO NERO FERMENTATO?



Step-01
(colorless)

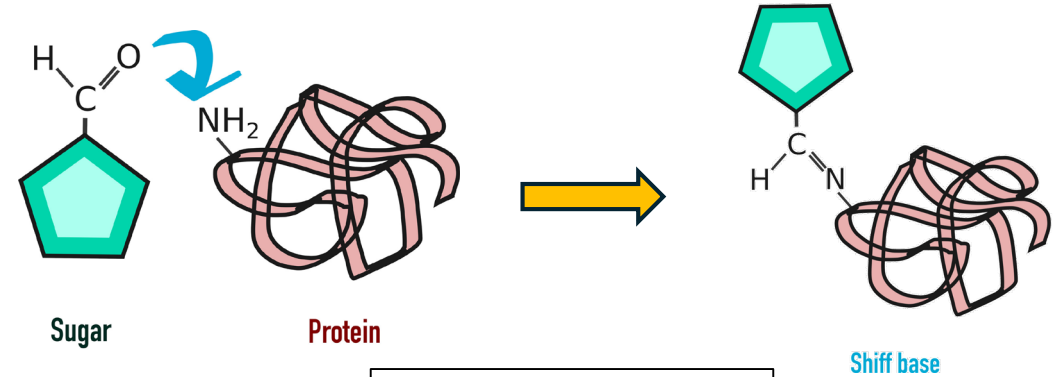


Step-02

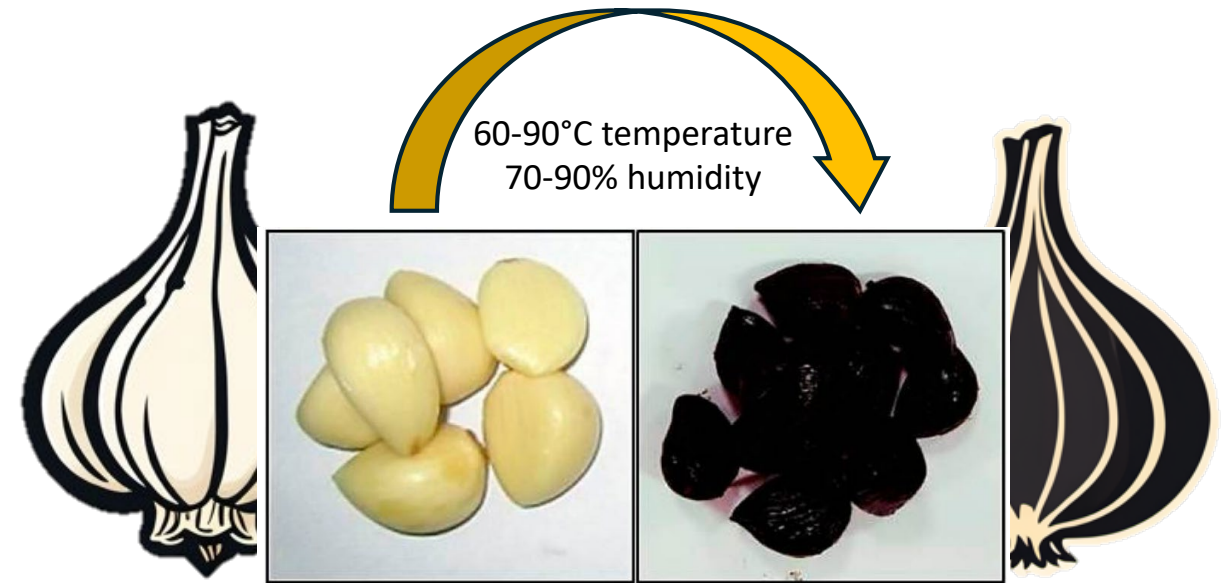


Step-03

HMF=Hydroxymethylfurfural



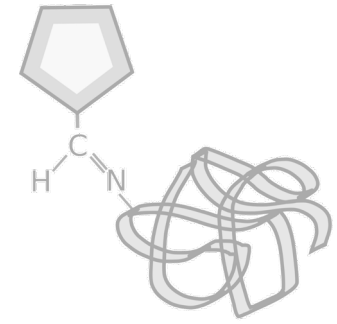
Allium sativum L.



Fresh Garlic

Aged Black Garlic

Components	Fresh garlic	Black garlic	Decrease/increase	Typical role
Reducing sugar	5.9 ± 0.8 g/kg DM	472.4 ± 46.5 g/kg DM	Increase	Give sweet taste in black garlic
Lipid	1.8 ± 0.1 g/kg FM	1.7 ± 0.1 g/kg FM	Increase	serves as an energy source, contributes in the sensory profile
Protein	8.4% FM	9.1% FM	Increase	Participates in Millard reaction
Water-soluble sugar	72.29% DM	85.61% DM	Increase	Sensory properties
Water activity	0.98	0.93	Decrease	development of a favorable texture
Organic acid	16.68 ± 0.61 g/kg DM	64.18 ± 7.55 g/kg DM	Increase	Helps in absorption of nutrients, immunity and digestive health
Polyphenol	38.87 ± 4.53 mg GAE/g DM	68.95 ± 1.63 mg GAE/g DM	Increase	Have anti-oxidant properties
Melanoidin	<0.1 OD FM	1.8 OD FM	Increase	Antihypertensive, antioxidant, antimicrobial, and prebiotic, effects
Mineral	11.74 ± 0.02 g/kg DM	13.14 ± 0.03 g/kg DM	Increase	vital for metabolism and physiological functions
Vitamin	6.92 ± 0.02 g/kg DM	9.26 ± 0.03 g/kg DM	Increase	Key role in biological activities
Alkaloid	Traces	28.55FM	Increase	pharmacological and biological properties
Allicin	11.28 ± 0.22 g/kg FM	2.31 ± 0.07 g/kg FM	Decrease	Catalysis the chemical reaction
SAC	19.61 ± 0.35 µg/g DM	105.07 ± 27.73 µg/g DM	Increase	radical scavenging properties
5-HMF	Not detected	0.23 ± 0.04 g/kg FM	Increase	Provides a range of range pharmacological and biological properties
SOD	12.96 g/kg FM	Not detected	Decrease	Important for radical scavenging properties



Schiff base

m sativum L.

HMF=Hydroxymethylfurfural

Fresh Garlic

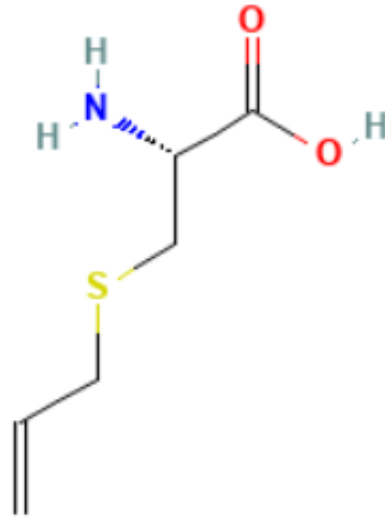
INTERNATIONAL JOURNAL OF FOOD PROPERTIES
2021, VOL. 24, NO. 1, 1387–1402
<https://doi.org/10.1080/10942912.2021.1967386>

 Taylor & Francis
Taylor & Francis Group

OPEN ACCESS
 Check for updates

Nutritional, biological, and therapeutic properties of black garlic: a critical review

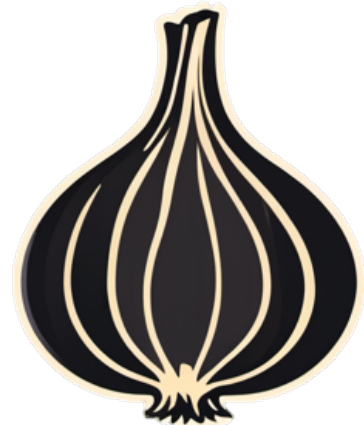
 Muhammad Afzaal^a, Farhan Saeed^b, Rizwan Rasheed^b, Muzzamal Hussain^a,
 Muhammad Aamir^c, Shahzad Hussain^d, Abdellatif A. Mohamed^d, Mohamed S. Alamri^d,
 and Faqir M. Anjum^e



↑ S-Allylcysteine
(SAC)

S-Allylcysteine

- Fa parte dei composti organosolfurici;
- nota la sua azione come anti-ossidante, anti-infiammatorio;
- rispetto all'aglio fresco SAC aumenta di circa 5.5 volte;



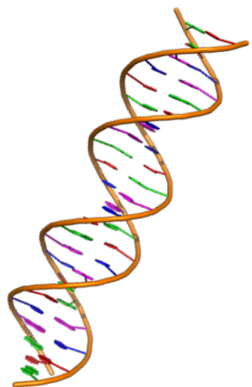
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Polifenoli

- proprietà anti-ossidanti;
- azione anti-infiammatoria;
- supporto alla salute cardiovascolare;
- prevenzione del cancro;
- ...

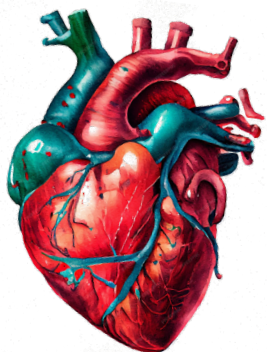
Potenziati Effetti Terapeutici dell'Aglio Nero Invecchiato

Anti-ossidante



Riduce i radicali liberi, previene danni cellulari e l'invecchiamento.

Cardioprotettivo



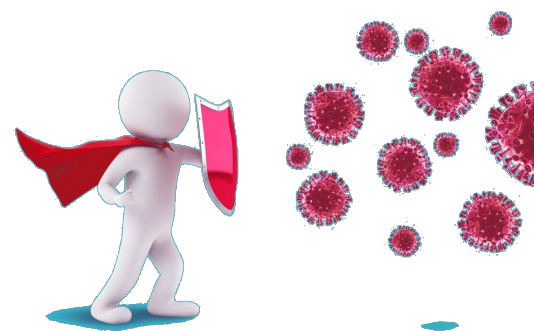
Abbassa il colesterolo LDL e migliora la funzione endoteliale.



Anti-infiammatorio

Diminuisce i marker infiammatori, utile per condizioni croniche.

Immunomodulatore



Potenzia la risposta immunitaria, aumentando la resistenza alle infezioni.

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Evidenze scientifiche sull' aglio nero fermentato (ABG)

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Biomedicine & Pharmacotherapy 163 (2023) 114810



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



Aged black garlic (*Allium sativum* L.) and aged black elephant garlic (*Allium ampeloprasum* L.) alleviate obesity and attenuate obesity-induced muscle atrophy in diet-induced obese C57BL/6 mice

Jongbeom Chae^a, Eunbi Lee^a, Seon Min Oh^b, Hyung Won Ryu^b, Soorin Kim^a, Ju-Ock Nam^{a,c,*}

^a Department of Food Science and Biotechnology, Kyungpook National University, Daegu 41566, the Republic of Korea



^b Natural Product Research Center, Korea Research Institute of Bioscience and Biotechnology, Cheongju-si, Chungcheongbuk-do 28116, the Republic of Korea

^c Research Institute of Tailored Food Technology, Kyungpook National University, Daegu 41566, the Republic of Korea

 foods



Article
Comparison of Efficacy of Fermented Garlic and Orlistat (Lipase Inhibitor) in Obesity Management Using an Experimental Rodent Model

Mavra Javed¹, Waqas Ahmed^{1,*}, Azmatullah Khan¹ and Imtiaz Rabbani²

¹ Department of Food Science and Human Nutrition, University of Veterinary and Animal Sciences, Lahore 54000, Pakistan

² Department of Physiology, University of Veterinary and Animal Sciences, Lahore 38040, Pakistan

* Correspondence: waqas.niaz@uvas.edu.pk; Tel.: +92-42-992-11374 (ext. 296) or +92-333-595-0108

ABG e obesità



nutrients



Article

Beneficial Effects of an Aged Black Garlic Extract in the Metabolic and Vascular Alterations Induced by a High Fat/Sucrose Diet in Male Rats

Sara Amor¹, Daniel González-Hedström^{1,2}, Beatriz Martín-Carro¹, Antonio Manuel Inarejos-García², Paula Almodóvar², Marin Prodanov³, Angel Luis García-Villalón¹ and Miriam Granado^{1,4,*}

ABG e obesità

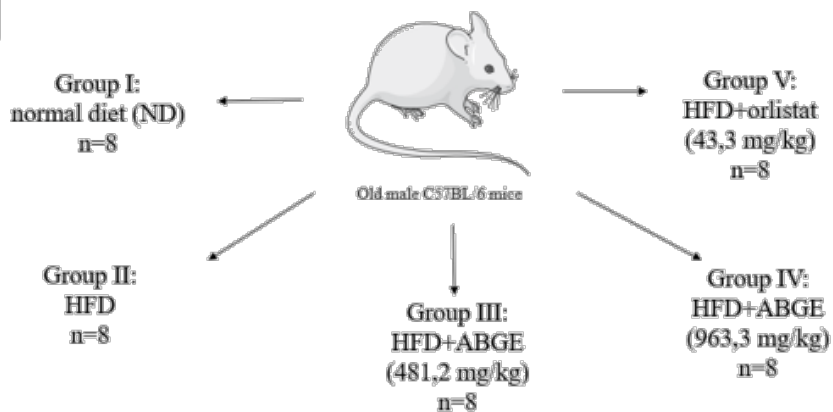


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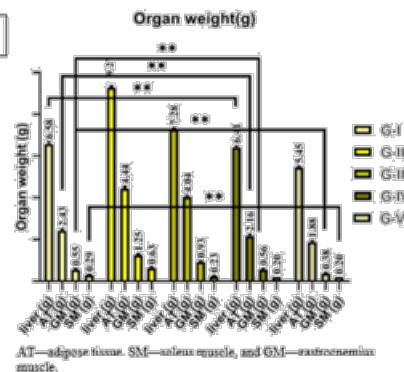
¹ Department of Food Science and Human Nutrition, University of Veterinary and Animal Sciences, Lahore-54000, Pakistan
² Department of Physiology, University of Veterinary and Animal Sciences, Lahore-54000, Pakistan
³ Correspondence: waqasiaz@uvas.edu.pk; Tel: +92-42-992-11374 (ext. 296) or +92-333-995-0188

Animal experiments

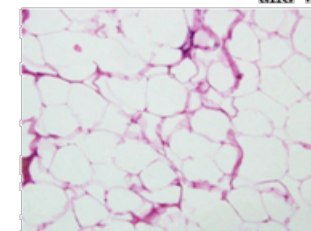


14 weeks

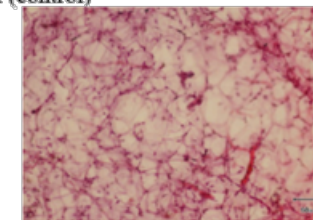
RESULTS



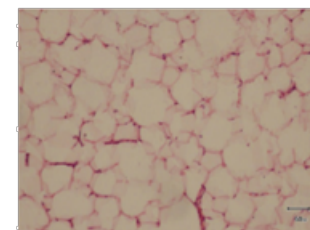
↑ Cholesterol in group II vs group I (control)
↓ IL-6 and CRP
↓ Cholesterol in groups III, IV and V vs group I (control)



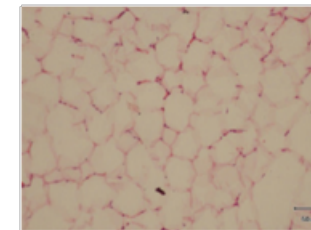
Group I (control)



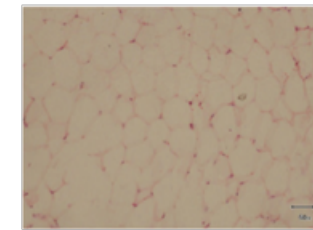
Group II (HFD)



Group III (HFD+481,2 mg/kg ABGE)



Group IV (HFD+963,3 mg/kg ABGE)



Group V (HFD+orlistat)

ABGE e obesità

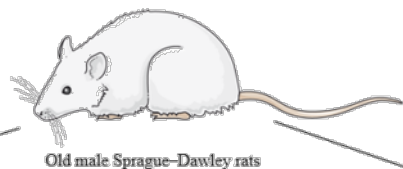


Article

Beneficial Effects of an Aged Black Garlic Extract in the Metabolic and Vascular Alterations Induced by a High Fat/Sucrose Diet in Male Rats

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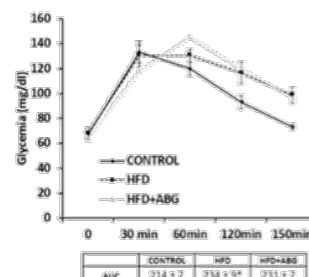
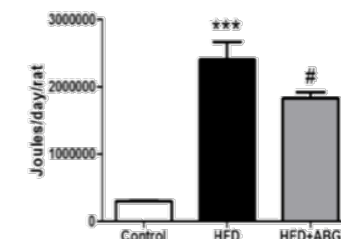
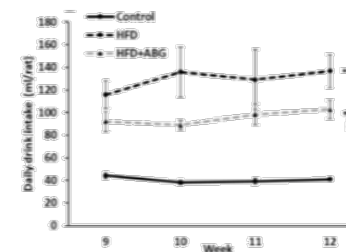
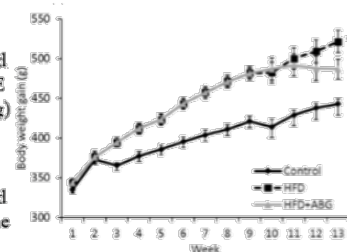
Old male Sprague-Dawley rats

Group I:
normal diet (ND)
n=24

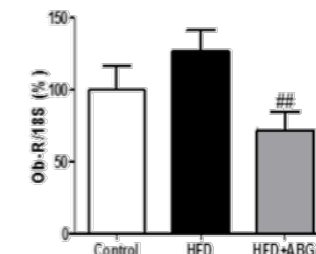
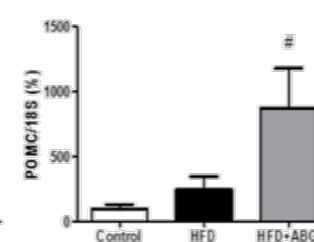
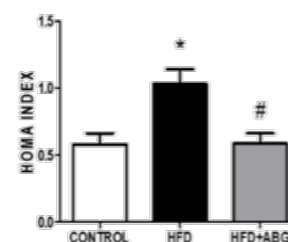
Group II:
HFD
n=24

12 weeks

Rats treated with ABGE (250 mg/kg) n=12
Rats treated with vehicle n=12



	CONTROL	HFD	HFD+ABG
AUC	214 ± 7	234 ± 9*	231 ± 7



↓IL-1b, TNF-a, iNOS
in HFD+ABG vs HFD

The decreased ObR gene expression may be related to the decreased circulating leptin.

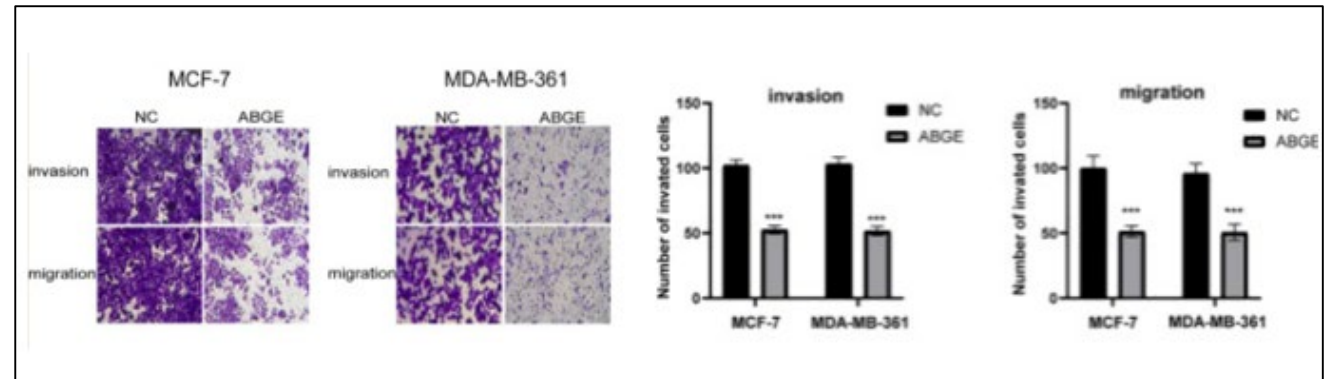
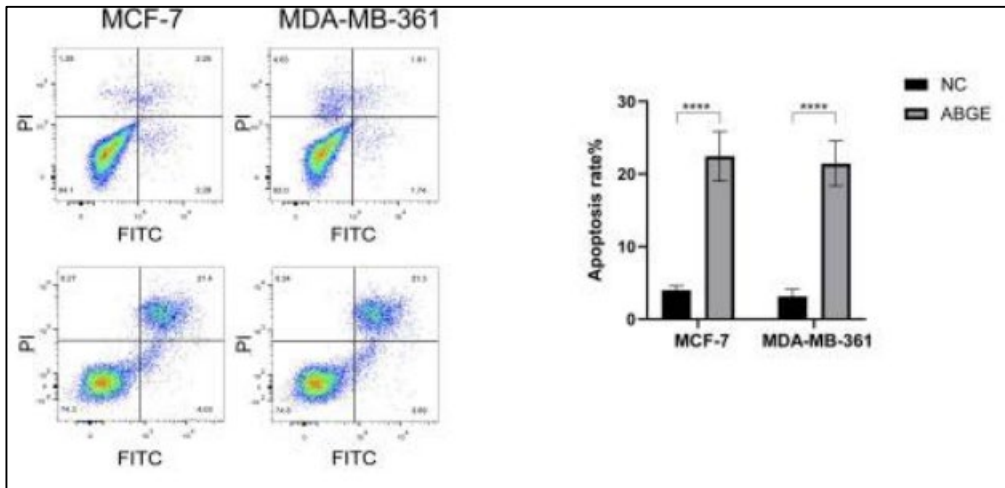
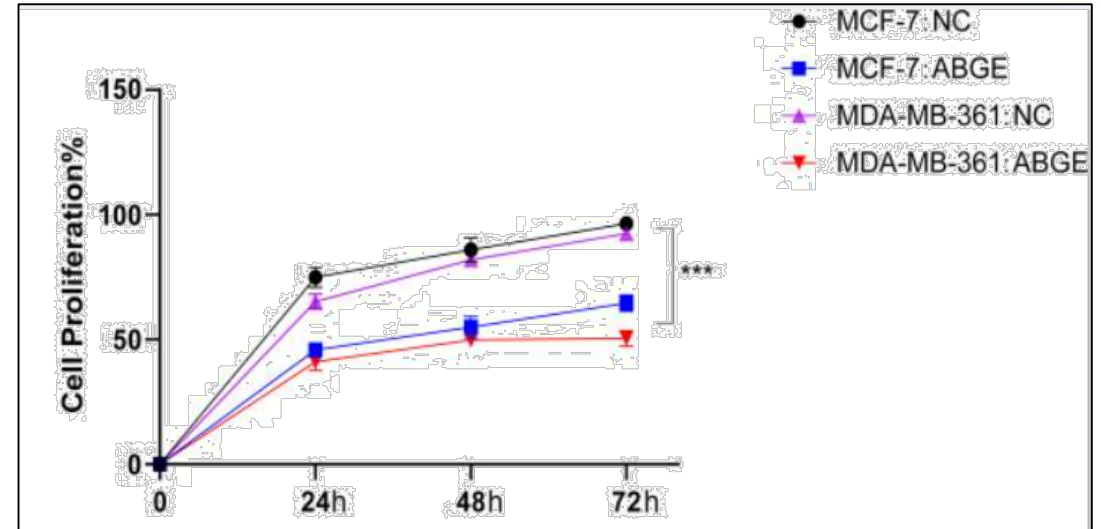
PLOS ONE

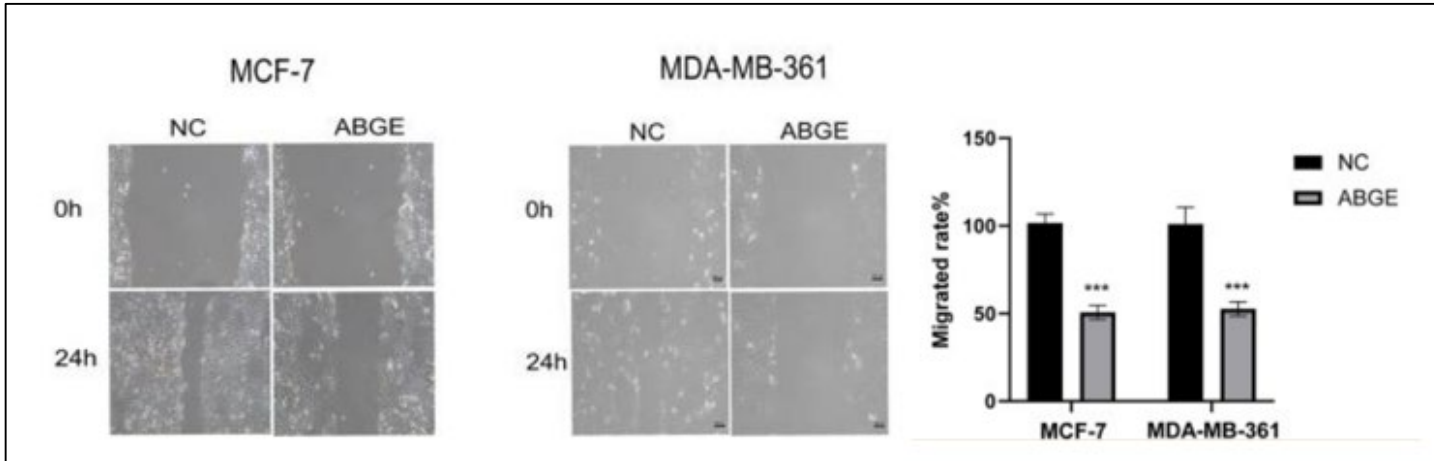
RESEARCH ARTICLE

Aged black garlic extract inhibits the growth of estrogen receptor-positive breast cancer cells by downregulating MCL-1 expression through the ROS-JNK pathway

Qiwei Yang¹, Fang Li², Guohui Jia³, Rui Liu^{4*}

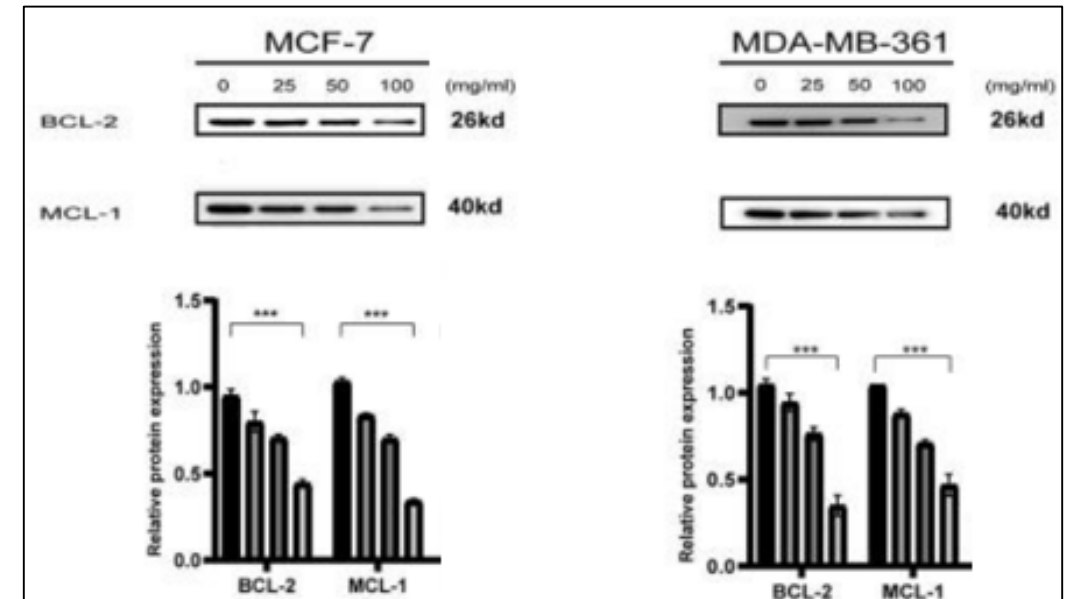
¹ Inner Mongolia Medical University Third Clinical Medical College, Inner Mongolia Autonomous Region, Baotou, China, ² Department of Experimental Center, The Third Affiliated Hospital of Inner Mongolia Medical University, Inner Mongolia Autonomous Region, Baotou, China, ³ Department of Laboratory, The Third Affiliated Hospital of Inner Mongolia Medical University, Inner Mongolia Autonomous Region, Baotou, China, ⁴ Department of General Surgery, The Third Affiliated Hospital of Inner Mongolia Medical University, Inner Mongolia Autonomous Region, Baotou, China





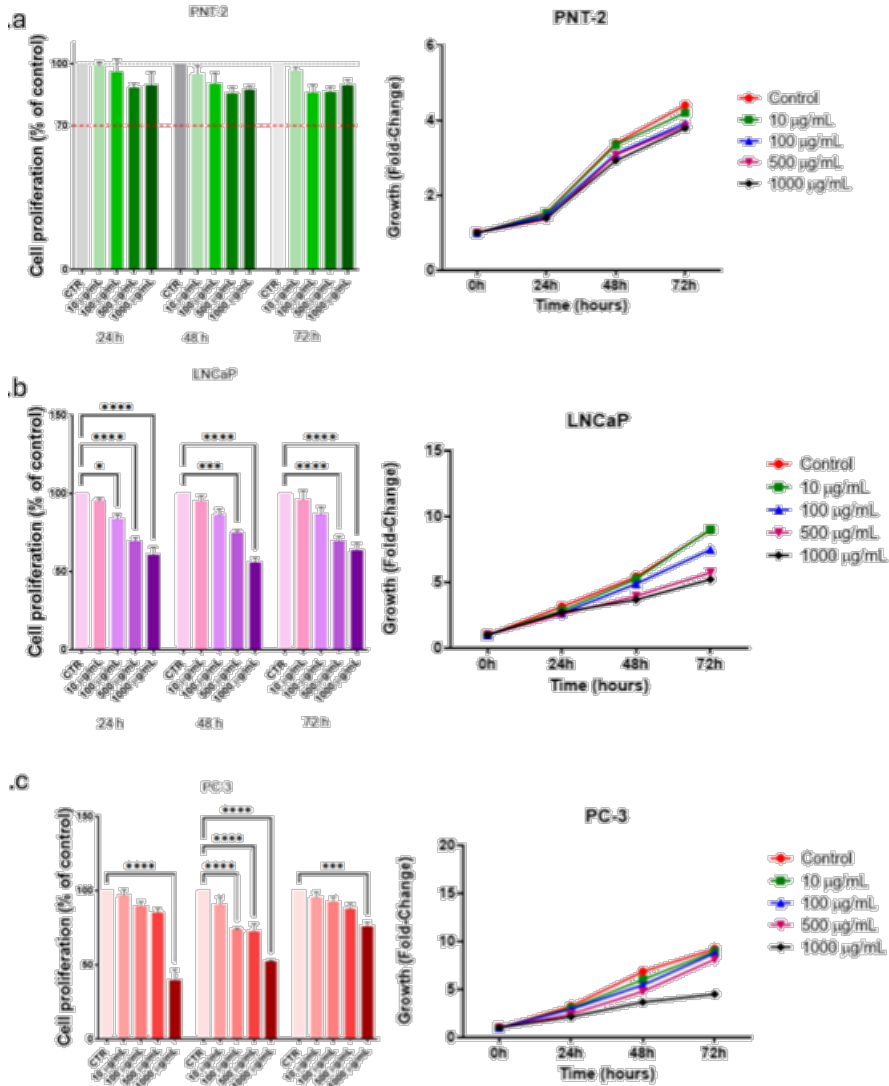
ABG e tumore della mammella

BCL-2 e MCL-1 sono geni anti-apoptotici

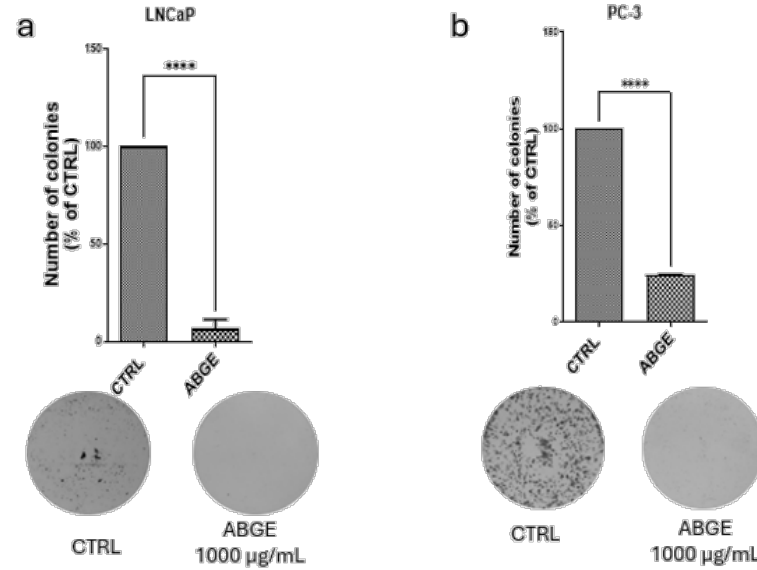


ABG e tumore della prostata

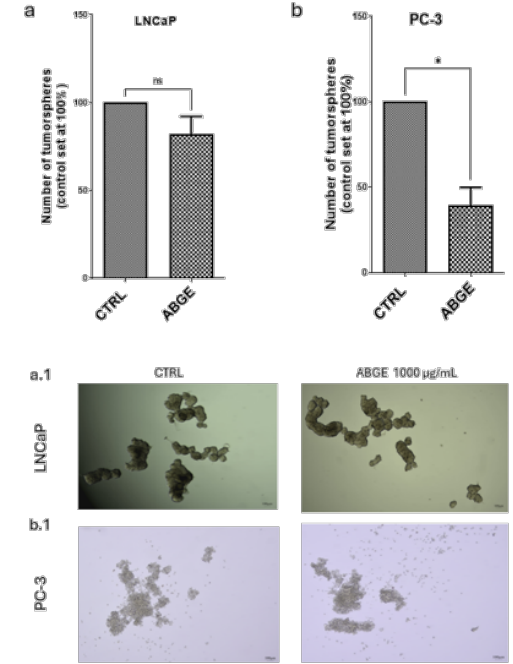
VITALITY ASSAY



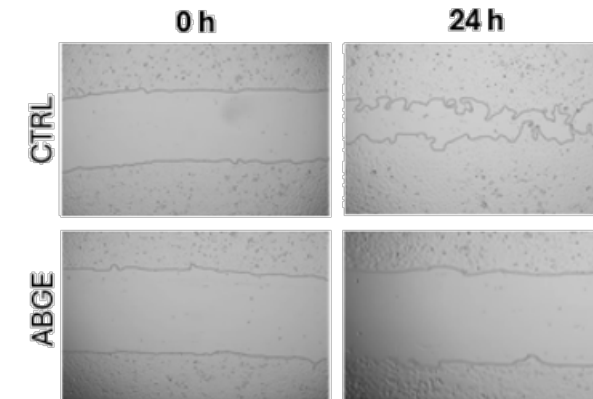
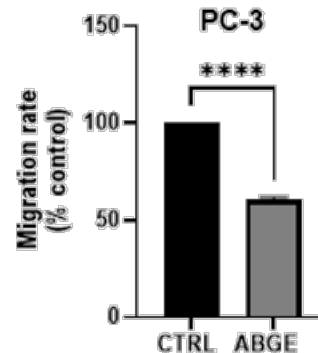
COLONIES FORMATION



TUMORSHERE FORMATION



MIGRATION ASSAY





Article

Anti-Inflammatory and Vasorelaxant Effects Induced by an Aqueous Aged Black Garlic Extract Supplemented with Vitamins D, C, and B12 on Cardiovascular System

Lucia Recinella ^{1,†}, Maria Loreta Libero ^{1,†}, Valentina Citi ², Annalisa Chiavaroli ^{1,*}, Alma Martelli ^{2,3,4,*}, Roberta Foligni ⁵, Cinzia Mannozi ⁵, Alessandra Acquaviva ^{1,6}, Simonetta Di Simone ¹, Vincenzo Calderone ^{2,3,4}, Giustino Orlando ¹, Claudio Ferrante ¹, Serena Veschi ¹, Anna Piro ¹, Luigi Menghini ¹, Luigi Brunetti ¹ and Sheila Leone ¹



Article

The Protective Effects of an Aged Black Garlic Water Extract on the Prostate

Maria Loreta Libero ^{1,2,3,†}, Antonio J. Montero-Hidalgo ^{2,3,4,5,†}, Lucia Recinella ^{1,*}, Raúl M. Luque ^{2,3,4,5,*}, Daniele Generali ^{6,7}, Alessandra Acquaviva ¹, Giustino Orlando ¹, Claudio Ferrante ¹, Luigi Menghini ¹, Simonetta Cristina Di Simone ¹, Nilofar Nilofar ¹, Annalisa Chiavaroli ¹, Luigi Brunetti ¹ and Sheila Leone ¹

Received: 18 March 2024 | Revised: 14 May 2024 | Accepted: 29 May 2024

DOI: 10.1002/ptr.8270

RESEARCH ARTICLE

WILEY

Anti-inflammatory and anti-hyperalgesic effects induced by an aqueous aged black garlic extract in rodent models of ulcerative colitis and colitis-associated visceral pain

Maria Loreta Libero ^{1,2} | Elena Lucarini ³ | Lucia Recinella ¹ | Clara Ciampi ³ | Serena Veschi ¹ | Anna Piro ¹ | Annalisa Chiavaroli ¹ | Alessandra Acquaviva ¹ | Nilofar Nilofar ¹ | Giustino Orlando ¹ | Daniele Generali ^{4,5} | Carla Ghelardini ³ | Lorenzo di Cesare Mannelli ³ | Antonio J. Montero-Hidalgo ^{2,6,7,8} | Raúl M. Luque ^{2,6,7,8} | Claudio Ferrante ¹ | Luigi Menghini ¹ | Simonetta Cristina di Simone ¹ | Luigi Brunetti ¹ | Sheila Leone ¹

TAKE HOME MESSAGES

L'Aglio Nero invecchiato offre numerosi benefici per la salute grazie alle sue proprietà antiossidanti, anti-infiammatorie, e cardioprotettive.

- Ricco di composti bioattivi come la S-Allylcysteine (SAC).
- Dimostrati effetti positivi sulla salute cardiovascolare.
- Supporto immunitario e riduzione dell'infiammazione.
- Attività anti-tumorale.

L' Aglio Nero Invecchiato ha un potenziale significativo per l'integrazione in prodotti nutraceutici.

Ulteriori ricerche potrebbero evidenziare nuove proprietà.



UNIVERSIDAD DE CÓRDOBA



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maria.libero@unich.it