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INTERACCIONES FÁRMACO-ALIMENTO

Mar Blanco Rogel

Julio 2021

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INTERACCIONES

FÁRMACO- FITOTERAPIA

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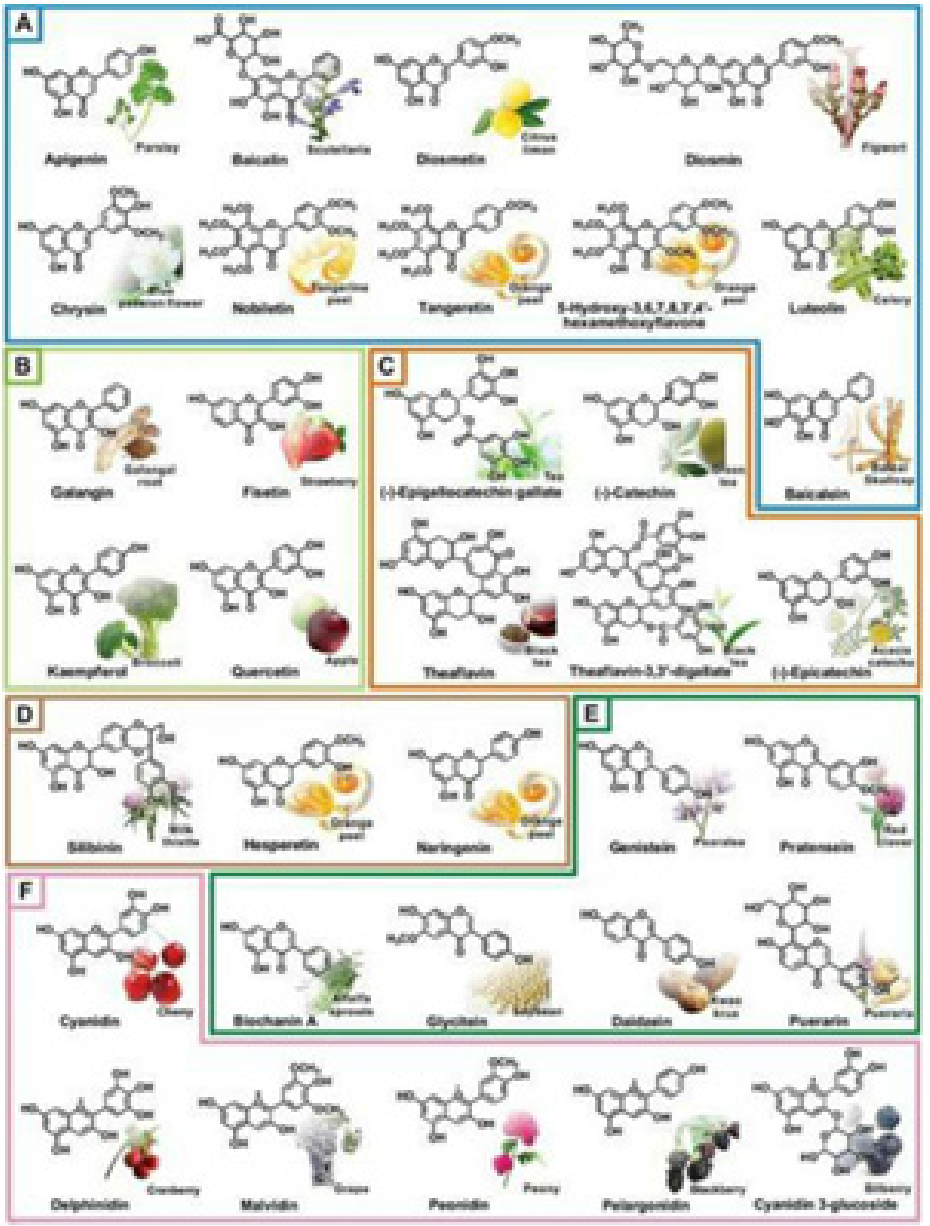
FITOTERAPIA

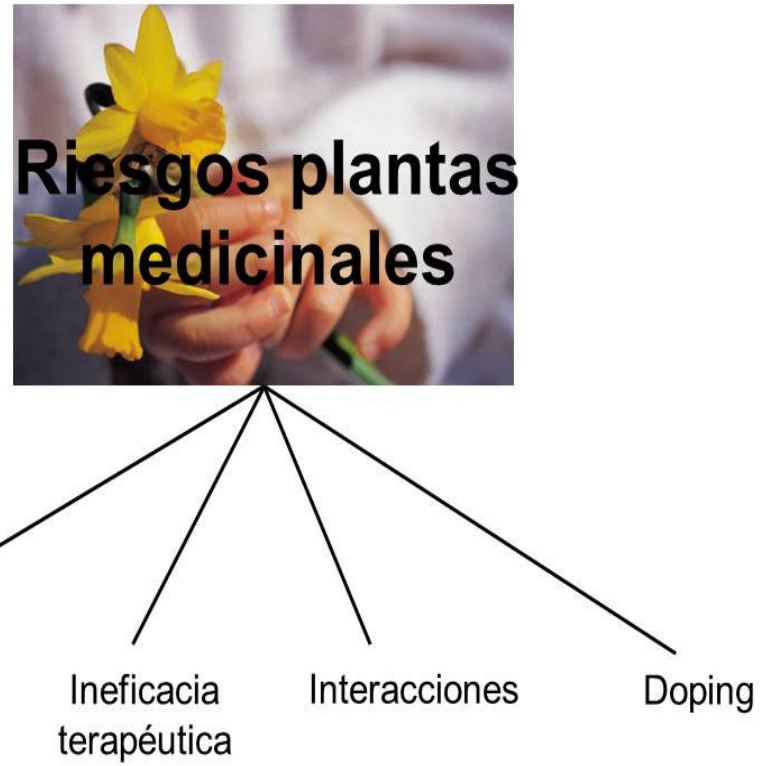
- Estructuras derivadas del metabolismo secundario de las plantas
- Protección frente depredadores y agentes externos medioambientales
- Polifenoles, taninos, catequinas, proantocianidinas….



INTERACCIONES FC ⟷ PLANTAS

100 % NATURAL

SEGURO ??? **EFECTIVO???**



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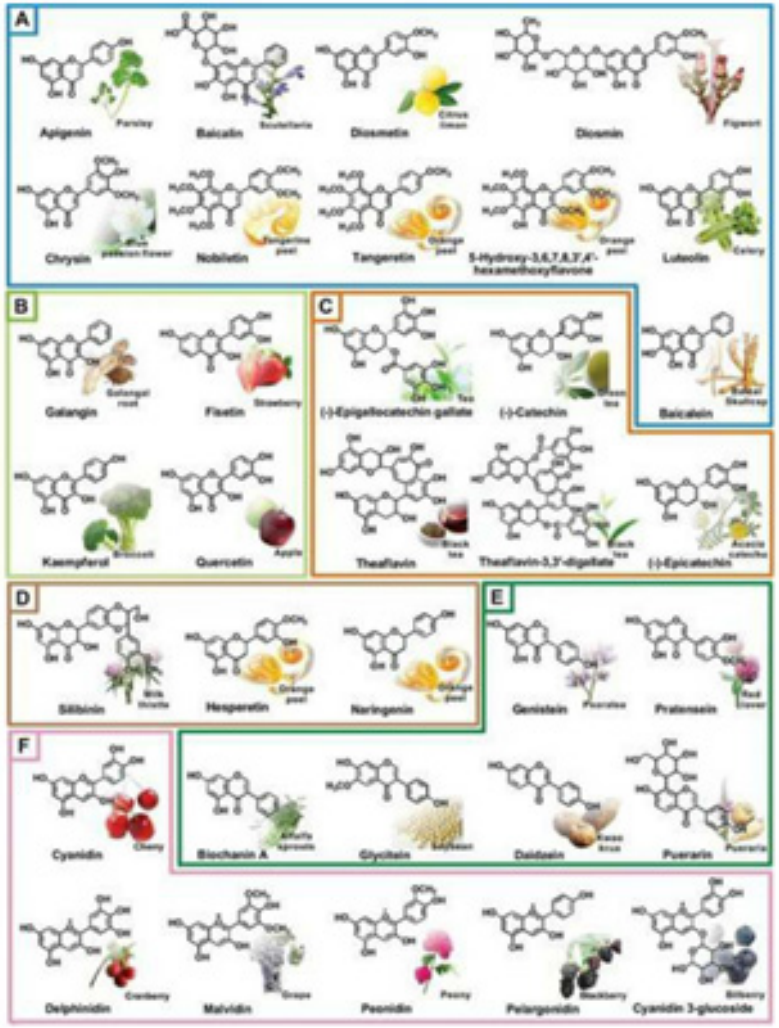
INTERACCIONES FC ⟷ PLANTAS



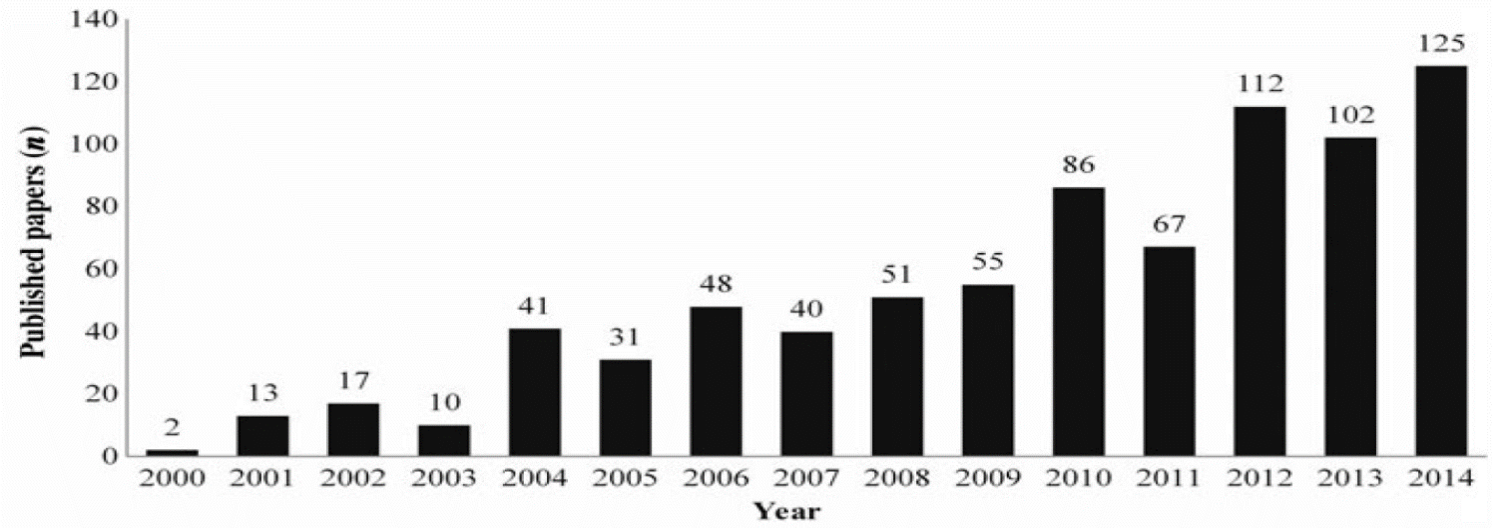
Revista de Fitoterapia 2013; 13 (2): 101-122 1

INTERACCIONES FC - PLANTAS

Interés creciente

Número de publicaciones por año sobre la interacción de productos a base de plantas con medicamentos

2000 - 2014



Choi *et al*. (2016) J. Alt. Comp. Med. 22(4): 262-279

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" Los productos están corectamente etiquetados en género, pero no especie. El ginseng es una de las plantas **más falsificadas**. **Falta la estandarización** de la planta. Dosificaciones muy variables"

Harkey MR, Henderson GL, Gershwin ME, Stern JS, Hackman RM. Variability in commercial ginseng products: an analysis of 25 preparations. American Journal of Clinical Nutrition 2001; 73 (6): 1101-1106

Table 6. Plants most frequently involved in adverse effects as reported from three sources in the PlantLIBRA project.

Review from literature [9]		Data from Poisons Centers		Self-reported adverse effects (PFS Consumer survey)	
Plant	**%[a]**	**Plant**	**%[a]**	**Plant**	**%[a]**
Glycine max	19.3	*Valeriana officinalis*	14.3	*Valeriana officinalis*	9.2
Glycyrrhiza glabra	12.2	*Camellia sinensis*	6.2	*Camellia sinensis*	8.0
Camellia sinensis	8.7	*Melissa officinalis*	4.3	*Ginkgo biloba*	6.9
Ginkgo biloba	8.5	*Mentha x piperita*	4.3	*Paullinia cupana*	6.9
Citrus aurantium	5.1	*Passiflora incarnata*	4.3	*Cynara scolymus*	5.7
Cinnamomum verum	4.7	*Paullinia cupana*	4.3	*Echinacea spp.*	5.7
Cimicifuga racemosa	4.7	*Glycyrrhiza glabra*	3.7	*Olea europaea*	5.7
Echinacea purpurea	4.1	*Ilex paraguariensis*	3.7	*Oryza sativa+ Monascus purpureus (Red rice)*	5.7
Vitex agnus-castus	3.9	*Panax ginseng*	3.1	*Panax ginseng*	5.7
Hypericum perforatum	3.9	*Citrus aurantium*	2.5	*Equisetum arvense*	4.6
Panax ginseng	3.3	*Cynara scolymus*	2.5	*Allium sativum*	3.4
Valeriana officinalis	2.8	*Dioscorea villosa*	2.5	*Foeniculum vulgare*	3.4
Vitis vinifera	2.8	*Allium ursinum*	1.9	*Glycine max*	3.4
Total cases	**492**	**Total cases**	**161**	**Total cases**	**87**

[a]number of counts/total cases

doi:10.1371/journal.pone.0150089.t006

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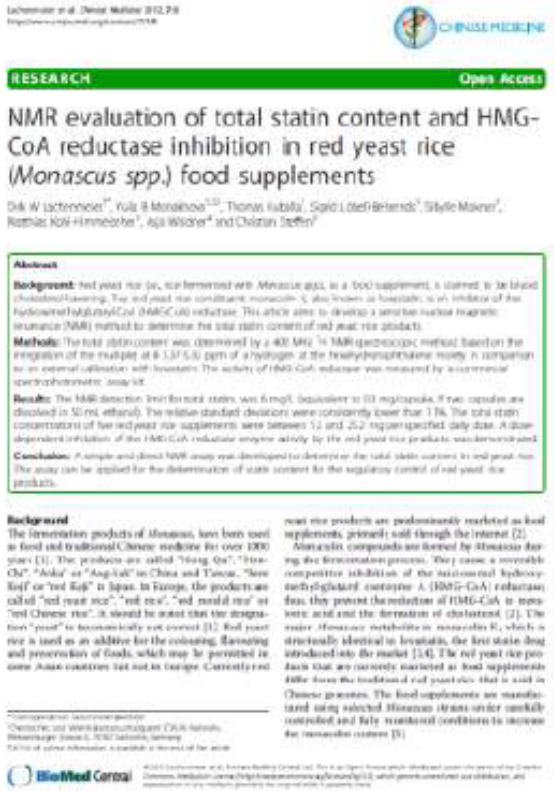
Otro problema frecuente. Contaminación intencionada



RESEARCH Open Access

NMR evaluation of total statin content and HMG-CoA reductase inhibition in red yeast rice (*Monascus spp.*) food supplements

Dirk W Lachenmeier*, Yulia B Monakhova, Thomas Kuballa, Sigrid Löbell-Behrends, Sibylle Maixner, Reinhäs Kohl-Himmelseher, Aija Wilsdorf and Christian Steffen

Abstract

Background: Red yeast rice (ie, rice fermented with *Monascus spp.*) as a food supplement is claimed to be blood cholesterol-lowering. The red yeast rice constituent monacolin K also known as lovastatin, is an inhibitor of the hydroxymethylglutaryl-CoA (HMG-CoA) reductase. This article aims to develop a sensitive nuclear magnetic resonance (NMR) method to determine the total statin content of red yeast rice products.

Methods: The total statin content was determined by a 400 MHz ^{1}H NMR spectroscopic method based on the integration of the multiplet at δ 5.37-5.31 ppm of a hydrogen of the hexahydronaphthalene moiety in comparison to an external calibration with lovastatin. The activity of HMG-CoA reductase was measured by a commercial spectrophotometric assay kit.

Results: The NMR detection limit for total statins was 6 mg/L (equivalent to 03 mg/capsule if two capsules are dissolved in 50 mL ethanol). The relative standard deviations were consistently lower than 11%. The total statin concentration of five red yeast rice supplements were between 1.2 and 25.2 mg per specified daily dose. A dose-dependent inhibition of the HMG-CoA reductase enzyme activity by the red yeast rice products was demonstrated.

Conclusion: A simple and direct NMR assay was developed to determine the total statin content in red yeast rice. The assay can be applied for the determination of statin content for the regulatory control of red yeast rice products.

Background

The fermentation products of *Monascus*, have been used as food and traditional Chinese medicine for over 1000 years [1]. The products are called "Hong Qu", "Hong-Chi", "Anka" or "Ang-Kak" in China and Taiwan, "Beni Koji" or "red Koji" in Japan. In Europe, the products are called "red yeast rice", "red rice", "red mould rice" or "red Chinese rice". It should be noted that the designation "yeast" is taxonomically not correct [1]. Red yeast rice is used as an additive for the colouring, flavouring and preservation of foods, which may be permitted in some Asian countries but not in Europe. Currently red yeast rice products are predominantly marketed as food supplements, primarily sold through the Internet [2].

Monascus compounds are formed by *Monascus* during the fermentation process. They cause a reversible competitive inhibition of the microsomal hydroxymethylglutaryl coenzyme A (HMG-CoA) reductase; thus, they prevent the reduction of HMG-CoA to mevalonic acid and the formation of cholesterol. [2]. The major *Monascus* metabolite in monacolin K, which is structurally identical to lovastatin, the first statin drug introduced into the market [3,4]. The red yeast rice products that are currently marketed as food supplements differ from the traditional red yeast rice that is sold in Chinese groceries. The food supplements are manufactured using selected *Monascus* strains under carefully controlled and fully monitored conditions to increase the monacolin content [5].

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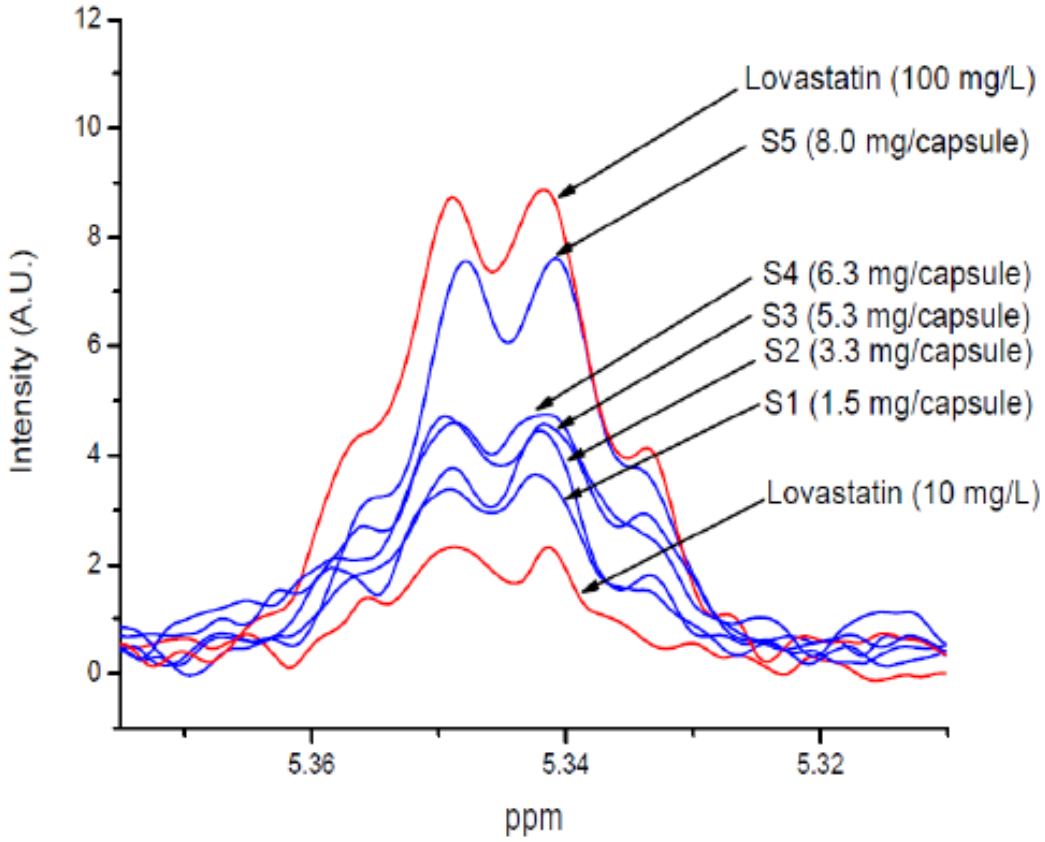

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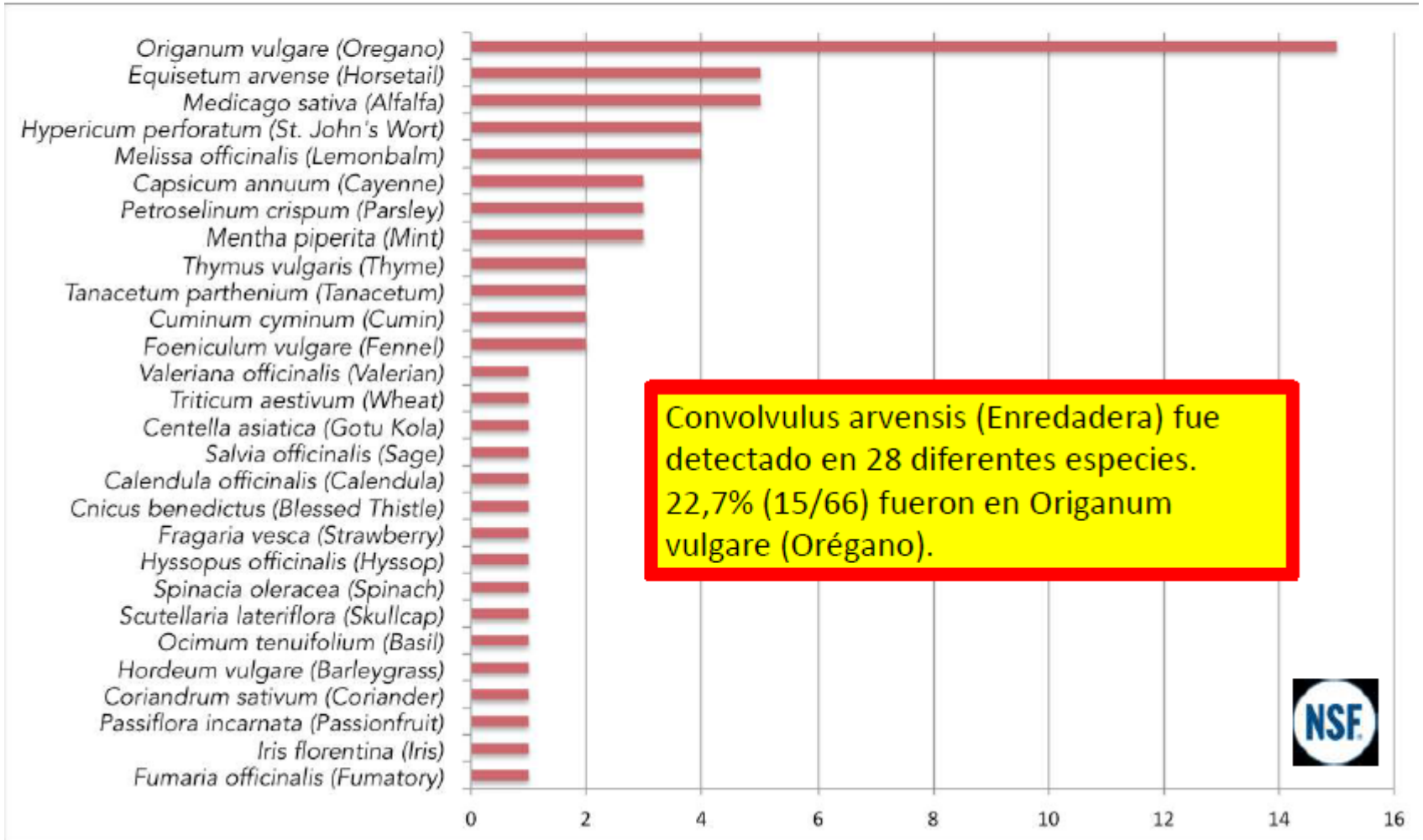
Especies conteniendo Convolvulus arvensis



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NOMBRE DEL PRODUCTO / PRODUCT NAME	GUARANA
NOMBRE EN LATIN / BOTANICAL NAME	PAULLINA CUPANA
NOMBRE INGLES / ENGLISH NAME	
FAMILIA	SAPINDACEAE
NUMERO CAS / CAS NUMBER	84929-28-2
NUMERO EINECS / EINECS NUMBER	284-512-1
PARTE USADA DE LA PLANTA / PLANT PART USED	SEMILLA
EXCIPIENTE / EXCIPIENTS	MALTODEXTRINA
LOTE / BATCH N.	
SOLVENTE DE EXTRACCION / EXTRACTION SOLVENT	ETHANOL/AGUA
RATIO DE EXTRACCION / RATIO OF EXTRACTION	HASTA TITULO DECLARADO
PRESENCIA DE CONSERVANTE- ANTIOXIDANTE / PRESENCE OF PRESERVATIVES-ANTIOXIDANT	AUSENCIA
PRODUCCION	

TEST FISICO - PHYSICAL TESTS

ESPECIFICACIONES / SPECIFICATIONS	**STANDARD**	
ASPECTO / APPEARANCE	POLVO MARRON	
OLOR / ODOUR	CARACTERISTICO / CHARACTERISTIC	
GUSTO / TASTE	CARACTERISTICO / CHARACTERISTIC	
TAMAÑO/ SIZE	40 MESH	
SOLUBILIDAD / SOLUBILITY	MODERADAMENTE SOLUBLE	
PERDIDA POR DESECACION	<5%	

TEST QUIMICO / CHEMICAL TESTS

ESPECIFICACIONES / SPECIFICATIONS	**STANDARD**	
TITULO / TITLE	10 - 12% CAFEINA	
RESIDUOS SOLVENTES / RESIDUAL SOLVENTS	<0,05%	

NOMBRE DEL PRODUCTO / PRODUCT NAME	GUARANA
NOMBRE EN LATIN / BOTANICAL NAME	PAULLINA CUPANA
NOMBRE INGLES / ENGLISH NAME	
FAMILIA	SAPINDACEAE
NUMERO CAS / CAS NUMBER	84929-28-2
NUMERO EINECS / EINECS NUMBER	284-512-1
PARTE USADA DE LA PLANTA / PLANT PART USED	SEMILLA
EXCIPIENTE / EXCIPIENTS	MALTODEXTRINA
LOTE / BATCH N.	
SOLVENTE DE EXTRACCION / EXTRACTION SOLVENT	ETHANOL/AGUA
RATIO DE EXTRACCION / RATIO OF EXTRACTION	HASTA TITULO DECLARADO
PRESENCIA DE CONSERVANTE- ANTIOXIDANTE / PRESENCE OF PRESERVATIVES-ANTIOXIDANT	AUSENCIA
PRODUCCION	

TEST FISICO - PHYSICAL TESTS

ESPECIFICACIONES / SPECIFICATIONS	**STANDARD**	**METODO / METHOD**
ASPECTO / APPEARANCE	POLVO MARRON	VISUAL / VISUAL
OLOR / ODOUR	CARACTERISTICO / CHARACTERISTIC	OLFATIVO / OLFACTORY
GUSTO / TASTE	CARACTERISTICO / CHARACTERISTIC	GUSTATIVO / OF TASTE
TAMAÑO/ SIZE	80 MESH	
DENSITAD RELATIVA / RALTIVE DENSITY	0,30 - 0,60g/ml	
SOLUBILIDAD / SOLUBILITY	MODERADAMENTE SOLUBLE	
PERDIDA POR DESECACION	<5%	

TEST QUIMICO / CHEMICAL TESTS

ESPECIFICACIONES / SPECIFICATIONS	**STANDARD**	**METODO / METHOD**
TITULO / TITLE	22% CAFEINA	HPLC
RATIO	3 : 1	
RESIDUOS SOLVENTES / RESIDUAL SOLVENTS	<0,05%	Eu. Pharm.v.v (2.4.24)

INTERACCIONES DE PRODUCTOS DE PLANTAS

EMA y ESCOP

Información de les monografías de la EMA y ESCOP

FIGURA 1. Hipérico. Foto: B. Vanaclocha

Interacciones entre preparados vegetales y fármacos de síntesis: revisión de las monografías de la EMA y ESCOP

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Salvador Cañigueral b

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Resumen

El uso racional de la Fitoterapia se asienta en los requisitos
dad, seguridad y eficacia. Uno de los aspectos que más preoc
profesional de la salud es conocer las posibles interacciones
preparados a base de plantas medicinales y los fármacos de
especialmente los que tienen un margen terapéutico más e
como los anticoagulantes y los inmunosupresores.

Aunque existen multitud de publicaciones sobre el tema, lo
tados que ofrecen son a menudo contradictorios y no siempr
basados en evidencias clínicas. En este trabajo mostramos las
ciones descritas en las monografías de referencia en la actuali
de la EMA (Agencia Europea del Medicamento) y de ESCOP (*E
Scientific Cooperative on Phytotherapy*), que ofrecen datos rel
desde el punto de vista clínico, tanto en lo que respecta a indic
como a precauciones. Su análisis nos muestra que el número
gas vegetales que interaccionan con medicamentos es relativ
bajo (menos del 25%) y que las interacciones más frecuentes
anticoagulantes, corticoides, cardiotónicos, antiarrítmicos, be
zepinas, antidepresivos y antivirales. Las drogas y prepara
getales que muestran un nivel significativo de interacciones
sumidad de hipérico, los laxantes hidroxiantracénicos, las dro
mucílagos, la raíz de regaliz, las drogas con taninos, el bulbo d
hoja de ginkgo y la raíz de ginseng.

Palabras clave

Interacciones, drogas vegetales,preparados vegetales, fárm
síntesis, EMA (Agencia Europea del Medicamento) y de ESCO
pean Scientific Cooperative on Phytotherapy).

Fuente: www.fitoterapia.net

- ✓ Hasta el 2021
- ✓ 160 drogas y Preparados vegetales revisados
- ✓ Interacciones descritas en un **22%**

Grupo de fármacos	Droguas vegetales
Anticoagulantes	7
Corticoides	7
Cardiotònicos y antiarítmicos	6
Benzodiazepinas	4
Immunosupressores	4
Terapia hormonal	2
IMAO	2
Laxantes hidroxiantracènicos	1

Grupo de fármacos	Droguas vegetales
Antidepressius	1
Antivirals	1
Antihipertensivos	1
Anticonceptivos	1
Teofilina	1
Alteración absorción de fàrmacos en general	7

Vanaclocha *et al*. (2014) Rev. Fitoter. 14(1): 5-36

PHYTOTHERAPY RESEARCH
Phytother. Res. (2013)
Published online in Wiley Online Library
(wileyonlinelibrary.com) **DOI**: 10.1002/ptr.5050

REVIEW

Hypericum perforatum: Pharmacokinetic, Mechanism of Action, Tolerability, and Clinical Drug–Drug Interactions

Table 4. HP–drug interactions

Prescribed drug	Clinical results of the interaction with HP	Possible mechanism	References
Antihistamine			
Fexofenadine	Increased the maximum plasma concentration and decreased the oral c learance		Wang *et al.*, 2002; Di *et al.*, 2008
Bronchodilator			
Theophylline	Decreased plasma concentration	Induction of hepatic cytochromes	Chen *et al.*, 2012
Cardiovascular			
Warfarin	A loss of the anticoagulant effect; significant reduction in the pharmacological effect of racemic warfarin	Particle formation in aqueous solution with HP; induction of CYP3A4	Gröning *et al.*, 2003; Jiang *et al.*, 2004
Phenprocoumon	Decreased plasma levels	Induction of CYP3A4	Chen *et al.*, 2011
Nifedipine	Induced metabolism with increased plasma concentrations of dehydronifedipine	Induction of CYP3A4 and CYP2C19	Wang *et al.*, 2007
Verapamil	Reduced bioavailability	Induction of first-pass CYP3A4 metabolism	Tannergren *et al.*, 2004
Digoxin	Decreased intestinal absorption; reduction of plasma AUC and C_{max}	Induction of the P-gp	Gottesman *et al.*, 1996; Johne *et al.*, 1999
Hypolipidemic			
Atorvastatin	Increased LDL Increased total cholesterol	Increases CYP3A4 and P-gp activity	Holtzman *et al.*, 2006; Markowitz *et al.*, 2003
Simvastatin	Increased LDL	Decreased plasma concentrations	Sugimoto *et al.*, 2001
Gastrointestinal			
Omeprazole, esomeprazole, and pantoprazole	Decrease plasma concentration of proton pump inhibitors	Induction of CYP2C19	Wang *et al.*, 2004
Loperamide	Brief episode of delirium	Theoretically induces a monoamine oxidase inhibitor–drug reaction	Khawaja *et al.*, 1999

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REVIEW

Hypericum perforatum: Pharmacokinetic, Mechanism of Action, Tolerability, and Clinical Drug–Drug Interactions

Oral contraceptives			
Etinilestradiol and desogestrel	Reduction of plasmatic concentration, bleeding, and pregnancies	Induction of CYP3A4	Zhou *et al.*, 2004; Hall *et al.*, 2003; Borrelli and Izzo, 2009; Dresser *et al.* 2003; Izzo, 2004
Etinilestradiol and noretindrone	Increased clearance of noretindrone and decreased half-time of etinilestradiol Increased metabolism of noretindrone and etinilestradiol		
Non-steroidal antiinflammatory drugs			
Ibuprofen	Reduction of plasmatic concentration	Increase expression of glycoprotein G	Bell *et al.*, 2007b; Zhou *et al.*, 2004; Izzo, 2004; Dresser *et al.*, 2003
Corticosteroids			
Dexamethasone, prednisone, and budesonide	Reduction of plasmatic concentration	Induction of CYP3A4	Izzo, 2004; Bell *et al.*, 2007a
Opioids			
Methadone and pethidine	Reduction of plasmatic concentration and	Induction of CYP2D2	Dostalek *et al.*, 2005
Dextromethorphan	abstinence syndrome		
Oxycodone	Reduction of plasmatic concentration Reduction of plasmatic concentration	Induction of CYP3A4	Nieminen *et al.*, 2010
Antimicrobial			
Voriconazole	Decreased AUC	Induction of CYP3A4, CYP2C19, and CYP2C9	Borrelli and Izzo, 2009
Erythromycin	Increased metabolism of erythromycin (decreased AUC)	Induction of CYP3A4 (40%)	Borrelli and Izzo, 2009
Indinavir	Decrease in AUC of 57%	Induction of CYP3A4	Borrelli and Izzo, 2009; Chen *et al.*, 2012

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(wileyonlinelibrary.com) **DOI**: 10.1002/ptr.5050

REVIEW

Hypericum perforatum: Pharmacokinetic, Mechanism of Action, Tolerability, and Clinical Drug–Drug Interactions

Prescribed drug	Clinical results of the interaction with HP	Possible mechanism	References
Antineoplastic			
Imatinib	Decreased plasma concentration	Induction CYP3A4 and	
Irinotecan	Altered hepatic metabolism	P-gp	Caraci *et al.*, 2011
Docetaxel	Decreased clinical efficacy		Izzo and Ernst, 2009
Immunosuppressants			
Cyclosporine	Decreased plasma concentration	Induction enzymes	He *et al.*, 2012; Hu *et al.*, 2005
Tacrolimus	Organ rejection	cytochrome and P-gp	Mai *et al.*, 2003
Hypoglycaemic agents			
Gliclazide	Decreased plasma concentration	Induction enzymes	Izzo and Ernst, 2009
Tolbutamide		cytochrome and P-gp	Di *et al.*, 2008

AUC, area under the curve; HP, *Hypericum perforatum*; LDL, low-density lipoprotein; P-gp, P-glycoprotein.

Inducción del SMH por componentes propios de algunos vegetales

- Antipirina / coles

  10 voluntarios sanos, no fumadores ni consumidores habituales de café o té y no medicados durante el estudio:

  10 días dieta control
  7 días dieta rica en coles
  10 días dieta control

- Niveles plasmáticos de antipirina disminuyen un 22% , la semivida plasmática disminuye un 13% y el aclaramiento metabólico aumenta un 11%, a las 30 horas de la administración.
- Valores retornan a la normalidad al reinstaurar la dieta control.

- INDOLES & GLUCOSINOLATOS

✓ ***Abundantes en verduras del género brassica: coles, ...***

✓ ***dieta que contenga diariamente estas verduras puede reducir hasta la mitad la biodisponibilidad de algunos fármacos.***

¿Requieren los vegetarianos mayores dosis de algunos fármacos?

AJO (ALLIUM SATIVUM)

Hipolipemiantes

Antiagregante

Activador de la fibrinólisis

Vasodilatador periférico

Antimicrobiano

Antihelmíntico

Quelante

- Olor de la piel y la respiración
- Urticaria
- Quemaduras en piel con el uso tópico
- Irritación gastrointestinal
- Incremento de los tiempos de coagulación
- Hipotensión
- Vértigo de meniere

AJO (*ALLIUM SATIVUM*)

- *In vitro* se ha encontrado que inhibe CYP 2C9 CYP2C19, CYP3A4 y la actividad de la glucoproteína p.

- En hepatocitos humanos solo inhibición de CYP2C9

- Con la alicina pura o muy concentrada se ha encontrado inhibición de CYP3A4 y glucoproteína p y en otros casos inducción.

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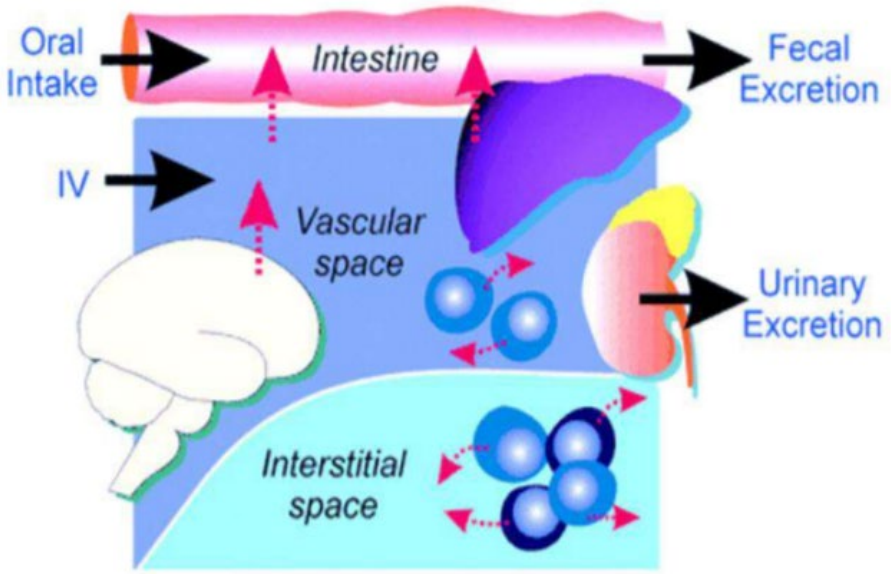
CYP3A4	FÁRMACOS		
SUSTRATOS	Acetominofen Aldrin Alfentanil Amiodarona Aminopirina Amprenavir Antipirina Astemizol Benzfetamina Budesonida Carbamazepina Celecoxib Cisaprida Ciclofosfamida Ciclosporina Dapsona Delavirdina Digotixin Diltiazema Diazepam	Eritromicina Etinilestradiol Etoposida Flotamida Hidroxiarginina Ifosfamida Imipramina Indinavir Lansoprazol Lidocaína Loratadina Losartal Lovastatina Midazolam Nelfinavir Nicardipina Nifedipina Omeprazol Quinidina Rapamicina	Retinoico (Ácido) Saquinavir Esteroides Tacrolimos Tamoxifen Taxol Teniposida Tefenadina Tetrahidrocannabinol Teofilina Torenifen Triazolam Trimetadona Troleandomicina Verapamil Warfarina Zatocetron Zonisamida

CYP2C9	FÁRMACOS	
SUSTRATOS	Ácido tietílico Celecoxib Diclofenaco Fenacetina Pentobarbital Fenitoína	Piroxicam Tenoxicam Tetrahidrocanabinol Tolbutamida Torsemida *S*- Warfarina

SUSTRATOS DE GLUCOPROTEÍNA P

- Morfina, metadona , loperamida
- Carvedilol, aliskiren
- Dabigatran
- Digoxina
- Ciclosporina, tacrolimus
- Indinavir, saquinavir
- Atorvastatina, lovastatina, simvastatina
- Amitriptilina



Tomado de Lee & Gottesman,
J Clin Invest 101:287, 1998

CARDO MARIANO (*Sylibum marianum*)

- Flavoligninas: silimarina y silibilinas
- Flavonoides y esteroides

→ Hepatoprotector

CARDO MARIANO (*Sylibum marianum*)

- *In vitro* : Inhibición CYP2D6, CYP2E1, CYP3A4

- Estudios clínicos en humanos sanos:

En algunos no se ha demostrado afectación de las concentraciones de fármacos y en otros si, como es el caso de disminución de las concentraciones de metronidazol (posible inducción de CYP3A4 y glucoproteína p) , el caso del losartan con un aumento del área bajo la curva y disminución de las concentraciones del metabolito (Posiblemente por inhibición de CYP2C9)

GINKGO BILOBA

Contiene compuestos flavónicos:

- Demencia
- Estados distímicos
- Enfermedad de Alzheimer
- Cefalea
- Hipoacusia moderada

.

- Actividad antiagregante

- Hemorragias cerebrales, oculares y postquirúrgicas

En Microsomas hepáticos humanos se encontró inhibición potente de CYP1A2, CYP2C19, CYP2C9

• Estudios clínicos en humanos han encontrado una importante inducción del CYP2C19 Y CYP2C9

- Omeprazol, lanzoprazol
- Amitriptilina
- Clopidogrel
- Ciclofosfamida
- Diazepam
- Fenitoína

• Estar atentos con posibles interacciones con sustratos de CYP3A4

• Debido a que se ha descrito que el GB es un inhibidor del factor activador plaquetario puede interaccionar con antiplaquetarios o anticoagulantes.

Drug Metab Rev. 2013 Aug;45(3):353-85. doi: 10.3109/03602532.2013.815200.

Pharmacokinetic drug interactions involving Ginkgo biloba.

Unger M[1].

Author information

Abstract

Ginkgo biloba leaf extracts (GLEs) are popular herbal remedies for the treatment of Alzheimer's dementia, tinnitus, vertigo and peripheral arterial disease. As GLEs are taken regularly by older people who are likely to also use multiple other drugs for the treatment of, e.g. hypertension, diabetes, rheumatism or heart failure, potential herb-drug interactions are of interest. Preclinical studies of high doses/concentrations of GLEs of varying quality and standardization hinted at both an inhibition and induction of metabolic enzymes and transporters. However, in humans, positive in vitro-findings could not be replicated in vivo. At maximum recommended doses of 240 mg/day, a clinically relevant interaction potential of the standardized GLE EGb 761 could not be shown. GLE doses higher than the recommended ones led to a weak induction of the CYP2C19-mediated omeprazole 5-hydroxylation, and a weak inhibition of the CYP3A4-mediated midazolam 1'-hydroxylation, respectively. Also, the regular intake of a poorly characterized GLE at a dose of 360 mg/day slightly increased the bioavailability of talinolol, a substrate of P-glycoprotein and various organic anion-transporting polypeptides. Thus, regarding pharmacokinetic herb-drug interactions, the intake of the standardized GLE, EGb 761, together with synthetic drugs appears to be safe as long as daily doses up to 240 mg are consumed. If this applies to other extracts prepared according to the European Pharmacopoeia remains uncertain. Also, a relevant potential for drug interactions cannot be excluded for poorly standardized GLEs used in many food supplements.

PANAX GINSENG

Usos

- Regula la presión arterial
- Inmunoestimulante
- Hipolipemiante
- Hipoglicemiante
- Incrementa la secreción de insulina
- Regula la formación de glucógeno hepático.
- Inhibición de la agregación plaquetaria por medio de la regulación de niveles de GMPc y tromboxano A2.
- Efecto estimulante en SNC

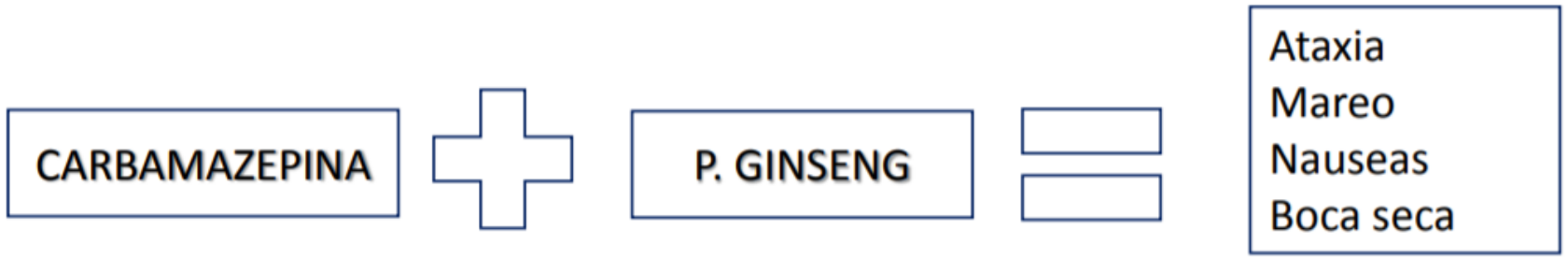
Efectos adversos reportados

- Hipertensión
- Mareo
- Dificultad para concentrarse
- Síndrome de Stevens-Johnson
- Mastalgia

PANAX GINSENG

- P. ginseng y warfarina Interacción ?

- Se ha encontrado una leve inducción de CYP3A4 lo que sería importante seguir en los medicamentos que sean sustratos de esta y de estrecho margen terapéutico tales como ciclosporina, tacrólimus, carbamazepina, irinotecan Y sirólimus.



VALERIANA OFFICINALIS

Farmacodinámicas

- Depresores del sistema nervioso central

Farmacocinéticas

- **Inhibición de CYP450 3A4**

Verapamilo + valeriana = bloqueo AV de 1er grado

Review > Expert Opin Drug Metab Toxicol. 2018 Jan;14(1):43-57.
doi: 10.1080/17425255.2018.1418854. Epub 2017 Dec 19.

Piperine-mediated drug interactions and formulation strategy for piperine: recent advances and future perspectives

Article highlights.

- Piperine may affect the intestinal drug absorption process via the various mechanisms.
- Piperine can inhibit or stimulate the expression and functional activity of metabolic enzymes and drug transporters, depending on the administered doses, route of administration, and duration of treatment.
- Piperine may be used as a bioenhancer to improve the oral bioavailability of co-administered drugs.
- The concurrent use of piperine may cause clinically significant piperine-drug interactions, leading to therapeutic benefits or adverse effects.

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Turmeric

Common Names

- Indian saffron
- Curcumin
- Jiang huang

Herb-Drug Interactions

Anticoagulants / Antiplatelets: Preclinical studies [54] [55] and a case report [66] suggest that turmeric can increase risk of bleeding.
Camptothecin: Turmeric inhibits camptothecin-induced apoptosis of breast cancer cell lines in vitro [28]. Clinical relevance is not known.
Mechlorethamine: Turmeric inhibits mechlorethamine-induced apoptosis of breast cancer cell lines in vitro [28]. Clinical relevance is not known.
Paclitaxel: In a recent case report, a lung cancer patient suffered liver toxicity while undergoing active treatment with paclitaxel. Although he was taking multiple supplements, one of which was tainted, turmeric was thought to be among the likely causes [73].
Doxorubicin: Turmeric inhibits doxorubicin-induced apoptosis of breast cancer cell lines in vitro [28]. Clinical relevance is not known.
Cyclophosphamide: Dietary turmeric inhibits cyclophosphamide-induced tumor regression in animal studies [28]. Clinical relevance is not known.
Norfloxacin: Pretreatment with curcumin resulted in increased plasma elimination half-life, thereby reducing the dosage of norfloxacin in animal model [56]. Clinical relevance is not known.

Eur Rev Med Pharmacol Sci. 2018 Aug;22(15):5042-5046. doi: 10.26355/eurrev_201808_15647.

Interaction study between antiplatelet agents, anticoagulants, thyroid replacement therapy and a bioavailable formulation of curcumin (Meriva®)

S Hu [1], G Belcaro, M Dugall, P Peterzan, M Hosoi, A Ledda, A Riva, L Giacomelli, S Togni, R

Results: After 10 days of supplementation with Meriva® the average BT value was not significantly different for patients assuming acetylsalicylic acid, ticlopidine or clopidogrel at standard dosages. Similarly, after 10 days of Meriva® treatment, the INR level in the two groups of patients assuming warfarin or dabigatran was not statistically different from that observed at baseline. In the analyzed patients assuming LT4 or metformin, no interactions between the therapy and Meriva® were observed.

Conclusions: Results from this non-interaction clinical study suggest that Meriva® does not interfere with the antiplatelet activity of the most common antiplatelet agents nor alters the INR values in stable patients assuming warfarin or dabigatran. Similarly, dosages of LT4 or metformin do not need to be adjusted in case of complementary treatment with Meriva®.

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Gracias ;)