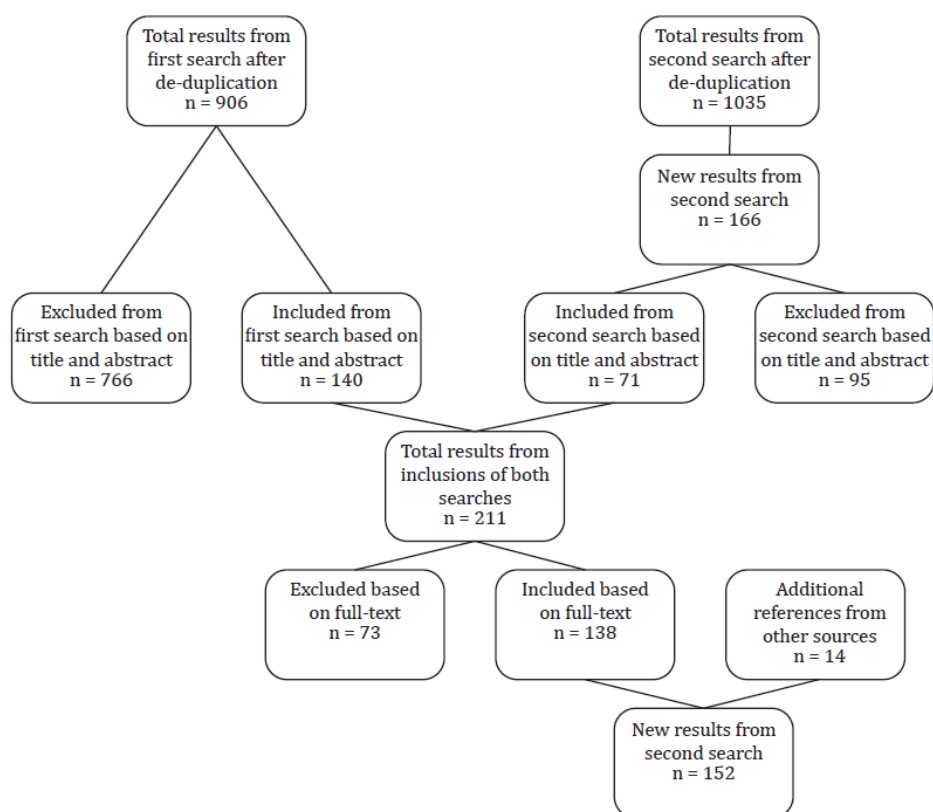


SUPPLEMENTARY MATERIAL



Supplementary figure S1: Flowchart of systematic search.

Search terms

Embase

('brown alga'/exp OR 'Himanthalia elongata extract'/de OR 'fucoidin'/de OR 'fucoxanthin'/de OR 'fucosterol'/de OR 'phloroglucinol'/de OR (phloroglucin* OR ascophyllum* OR ecklonia* OR laminaria* OR macrocystis* OR sargassum* OR undaria* OR saringosterol* OR fucosterin* OR fucosterol* OR fucoxanthin* OR fucoidin* OR fucoidan* OR himanthal* OR phaeophyt* OR phaeophyc* OR fucophycean* OR fucophyceae* OR oligomannate* OR phloroglucinol* OR phlorotannin* OR alaria-esculenta OR ((brown*) NEAR/3 (alga OR algae OR macroalga OR macroalgae)):ab,ti) AND ('allergy'/exp OR 'allergen'/exp OR 'leukocyte'/exp OR 'microglia'/de OR 'macrophage'/exp OR 'antigen presenting cell'/exp OR (allerg* OR atop* OR interdigitat*-cell* OR ((Langerhans OR antigen-present*) NEAR/3 (cell*)) OR histiocyte* OR kupffer* OR microglia* OR macrophage* OR dendritic-cell* OR mononuclear-cell* OR giant-cell* OR foam-cell* OR osteoclast* OR epithelioid-cell* OR monocyte* OR lymphocyte* OR leukocyte* OR leucocyte* OR granulocyte* OR basophil* OR eosinophil* OR neutrophil* OR promyelocyte* OR ((white*) NEAR/3 (cell*)):ab,ti) AND ('in vivo study'/exp OR 'follow up'/de OR 'nutraceutical'/de OR 'nutrition'/exp OR (in-vivo* OR clinic* OR case* OR cohort* OR longitud* OR prospect* OR retrospect* OR follow-up OR trial OR nutraceutic* OR nutriceutic* OR edible* OR diet* OR food* OR nutrition* OR nutrient* OR oral*):ab,ti) NOT ([Conference Abstract]/lim)

Medline

(exp Phaeophyta/ OR Phloroglucinol/ OR (phloroglucin* OR ascophyllum* OR ecklonia* OR laminaria* OR macrocystis* OR sargassum* OR undaria* OR saringosterol* OR fucosterin* OR fucosterol* OR fucoxanthin* OR fucoidin* OR fucoidan* OR himanthal* OR phaeophyt* OR phaeophyc* OR fucophycean* OR fucophyceae* OR oligomannate* OR phloroglucinol* OR phlorotannin* OR alaria-esculenta OR ((brown*) ADJ3 (alga OR algae OR macroalga OR macroalgae))).ab,ti.) AND (exp Allergens/ OR exp Leukocytes/ OR Microglia/ OR exp Macrophages/ OR exp Antigen-Presenting Cells/ OR (allerg* OR atop* OR interdigitat*-cell* OR ((Langerhans OR antigen-present*) ADJ3 (cell*)) OR histiocyte* OR kupffer* OR microglia* OR macrophage* OR dendritic-cell* OR mononuclear-cell* OR giant-cell* OR foam-cell* OR osteoclast* OR epithelioid-cell* OR monocyte* OR lymphocyte* OR leukocyte* OR leucocyte* OR granulocyte* OR basophil* OR eosinophil* OR neutrophil* OR promyelocyte* OR ((white*) ADJ3 (cell*))).ab,ti.) AND (exp Cohort Studies/ OR exp Food/ OR exp Nutrition Therapy/ OR (in-vivo* OR clinic* OR case* OR cohort* OR longitud* OR prospect* OR retrospect* OR follow-up OR trial OR nutraceutic* OR nutriceutic* OR edible* OR diet* OR food* OR nutrition* OR nutrient* OR oral*).ab,ti.) NOT (news OR congres* OR abstract* OR book* OR chapter* OR dissertation abstract*).pt.

Cochrane

((phloroglucin* OR ascophyllum* OR ecklonia* OR laminaria* OR macrocystis* OR sargassum* OR undaria* OR saringosterol* OR fucosterin* OR fucosterol* OR fucoxanthin* OR fucoidin* OR fucoidan* OR himanthal* OR phaeophyt* OR phaeophyc* OR fucophycean* OR fucophyceae* OR oligomannate* OR phloroglucinol* OR phlorotannin* OR alaria-esculenta OR ((brown*) NEAR/3 (alga OR algae OR macroalga OR macroalgae))).ab,ti) AND ((allerg* OR atop* OR (interdigitat* NEXT/1 cell*) OR ((Langerhans OR antigen-present*) NEAR/3 (cell*)) OR histiocyte* OR kupffer* OR microglia* OR macrophage* OR dendritic-cell* OR mononuclear-cell* OR giant-cell* OR foam-cell* OR osteoclast* OR epithelioid-cell* OR monocyte* OR lymphocyte* OR leukocyte* OR leucocyte* OR granulocyte* OR basophil* OR eosinophil* OR neutrophil* OR promyelocyte* OR ((white*) NEAR/3 (cell*))).ab,ti) AND ((in-vivo* OR clinic* OR case* OR cohort* OR longitud* OR prospect* OR retrospect* OR follow-up OR trial OR nutraceutic* OR nutriceutic* OR edible* OR diet* OR food* OR nutrition* OR nutrient* OR oral*);ab,ti)

Web of Science

TS=(((phloroglucin* OR ascophyllum* OR ecklonia* OR laminaria* OR macrocystis* OR sargassum* OR undaria* OR saringosterol* OR fucosterin* OR fucosterol* OR fucoxanthin* OR fucoidin* OR fucoidan* OR himanthal* OR phaeophyt* OR phaeophyc* OR fucophycean* OR fucophyceae* OR oligomannate* OR phloroglucinol* OR phlorotannin* OR alaria-esculenta OR ((brown*) NEAR/2 (alga OR algae OR macroalga OR macroalgae)))) AND ((allerg* OR atop* OR (interdigitat* NEAR/1 cell*) OR ((Langerhans OR antigen-present*) NEAR/2 (cell*)) OR histiocyte* OR kupffer* OR microglia* OR macrophage* OR dendritic-cell* OR mononuclear-cell* OR giant-cell* OR foam-cell* OR osteoclast* OR epithelioid-cell* OR monocyte* OR lymphocyte* OR leukocyte* OR leucocyte* OR granulocyte* OR basophil* OR eosinophil* OR neutrophil* OR promyelocyte* OR ((white*) NEAR/2 (cell*)))) AND ((in-vivo* OR clinic* OR case* OR cohort* OR longitud* OR prospect* OR retrospect* OR follow-up OR trial OR nutraceutic* OR nutriceutic* OR edible* OR diet* OR food* OR nutrition* OR nutrient* OR oral*)) AND DT=(Article OR Review)

Google Scholar (top 100)

phaeophyte|phaeophycean|phaeophytes|phaeophyceans|"brown alga|algae"

allergy|atopic|leukocytes|lymphocytes|granulocytes|langerhans|microglia|macrophages|histiocytes|kupffer|"dendritic|giant|foam|white cells" nutraceutical|nutrition|food|diet

Glossary of Terms

increased (compared to controls)

decreased (compared to controls)

= no change (compared to controls)

AA arachidonic acid

AAA abdominal aortic aneurysm

ACC acetyl-CoA carboxylase

AD Atopic dermatitis

ADRB3 beta-3 adrenergic receptor

AE aqueous extract

AF Apo-9'-fucoxanthinone

AGE advanced glycation end products

ALAT alanine aminotransferase

ALP alkaline phosphatase

ALT alanine aminotransferase

ALT alanine transaminase

ApoE apolipoprotein E

AST aspartate aminotransferase

AST aspartate transaminase

BAT brown adipose tissue

Ca calcium

CACC colitis associated colon cancer

CAP controlled attenuation parameters

CAT catalase

CCl4 carbon tetrachloride

CFA complete Freund's adjuvant

CNS central nervous system

conA concanavalin A

COX-2 cyclooxygenase 2

COX2 cyclooxygenase 2

CP cisplatin

CRP C-reactive protein

CY clycophosmamide

DNC 2,4-dinitrochlorobenzene

DNCB 2,4-dinitrochlorobenzene

DNP 2,4-dinitrophenol

DNP anti-dinitrophenyl

DSS dextran sodium sulfate

DSS dextran sulfate sodium

EAE experimental autoimmune encephalomyelitis

EH enzyme modified Sargassum fusiforme extracts

ER Endoplasmic Reticulum (ER)

ESR erythrocyte sedimentation rate

EtOH ethanol

F4/80 EGF-like module-containing mucin-like hormone receptor-like 1

Fc R Fc epsilon receptor

FD	Fine dust
Fx	fucoxanthin
FxOH	fucoxanthinol
GFS	hot water extract with galactofucan sulfate
GGT	gamma glutamyl transferase
GLUT4	glucose transporter type 4
GPx	glutathione peroxidase
GSH	glutathione
HA	hyaluronidase
Hb	hemoglobin
Hc	hematocrit
HCD	high cholesterol diet
HDL	high-density lipoprotein
HFD	high fat diet
HMWF	high-molecular-weight fucoidan
HOMA-IR	homeostatic model assessment for insulin resistance
HSFx	high stability fucoxanthin
i.n.	intranasal
i.p.	intraperitoneal
ICAM-1	intracellular adhesion molecule 1
ICR	Institute of Cancer Research
IFA	incomplete Freund's adjuvant
IFN- γ	Interferon gamma
Ig	immunoglobulin
iNOS	inducible nitric oxide
KC	keratinocyte chemoattractant
LBP	lipopolysaccharide-binding protein
LD	<i>Borrelia burgdorferi</i>
LDH	lactate dehydrogenase
LDL	low-density lipoprotein
LDL	low-density lipoprotein
LFD	low-fat diet
LMF	low-molecular-weight
LMWF	low-molecular-weight fucoidan
LOX	lipoxigenase
LPS	lipopolysaccharide
LXR	liver X receptor
M1	pro-inflammatory macrophage (classically activated)
M2	anti-inflammatory macrophage (alternatively activated)
MAPK	mitogen-activated protein kinase
MBP	Myelin basic protein
MCP-1	monocyte chemotactic protein-1
MDA	malondialdehyde
mDC	myeloid dendritic cell
MeOH	methanol
MES	meroterpenoid-rich fraction of ethanolic extract from <i>Sargassum serratifolium</i>
MetS	metabolic syndrome
MIP-2	macrophage inflammatory protein 2
MLN	mesenteric lymph node
MMP-9	matrix metalloproteinase 9
MMWF	medium-molecular-weight fucoidan

MPO	myeloperoxidase
NAFLD	nonalcoholic fatty liver disease
NF- κ B	nuclear factor- κ B
NH	Sargassum fusiforme extracts
NK	natural killer cell
NO	nitric oxide
OVA	ovalbumin
OXA	oxazolone
oxLDL	oxidized low-density lipoprotein
PCA	passive cutaneous anaphylaxis
PCON	polycystic ovary syndrome
PCOS	polycystic ovary syndrome
pDC	plasmacytoid dendritic cell
PFF	phlorofucofuroeckol
PGC1 α	peroxisome proliferator-activated receptor gamma coactivator 1-alpha
PGE2	prostaglandin E2
PHB	2,7-phloroglucinol-6,6'-bieckol
PI-3K	phosphatidyl inositol-3 kinase
PLA2	phospholipase A2
PM	particulate matter
PMN	polymorphonuclear leukocytes
PON-1	serum paraoxonase-1
PPAR	peroxisome proliferator-activated receptor
PPB	pyrogallol-phloroglucinol-6,6'-bieckol
PREC	phlorotannin-rich extract of Ecklonia cava
QOL	quality of life
RAGE	receptor for advanced glycation end-products
RBC	red blood cells
ROS	reactive oxygen species
SDF-1	stromal cell-derived factor 1
SIRT1	sirtuin 1
SMCs	smooth muscle cells?
SOCS-3	suppressor of cytokine signaling 3
SOD	superoxide dismutase
TG	triglyceride
TIMP-1	tissue inhibitor of metalloproteinase 1
TPA	12-O-tetradecanoylphorbol-13-acetate
UCP-1	uncoupling protein 1
VCAM-1	vascular cell adhesion molecule 1
WAT	white adipose tissue
WBC	white blood cells
WL	wakame lipids
WSSV	White Spot Syndrome Virus