

Human experience of herbal medicines: the opportunities for future use

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Director

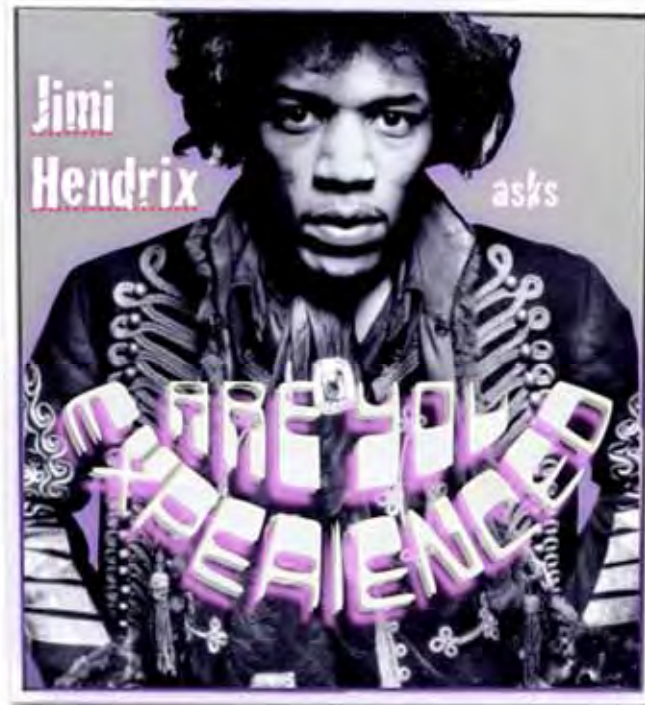


and of the



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Warning: this presentation is distorted by experience!

rude

Etymology: Middle English, from Anglo-French, from Latin *rudis*; unwrought, uncultivated probably akin to Latin *rudus* rubble

1 a) being in a rough or unfinished state; crude b) natural; raw c) primitive, undeveloped d) simple elemental

2 lacking refinement or delicacy: a) ignorant, unlearned b) inelegant, uncouth c) offensive in manner or action: discourteous d) uncivilized, savage e) coarse, vulgar

3 chiefly *Brit.* vigorous robust, hearty, sturdy *eg. in rude health*

rude health?



rude health

.....who in attaining his hundredth year was advised by his physician to reduce his consumption of sherrie from five pints a day down to four

Quoted by William Rees Mogg in *The Independent* 15th January 1990 from

Easton J. *Human Longevity, recording the name, age, place of residence and year of the decease of 1,712 persons who attained a century, and upwards, from AD66 to 1799.* London, 1799

Human experience of herbal medicines

People have developed approaches to using plants as medicines over many centuries, even millennia.

These were times in which life depended on vigour, when rude health was the only sustainable solution, when people looked for medicine that made them stronger.

Medical science has reflected modern times and altered the language: herbal medicinal products have increasingly complied with the new culture.

However there are many traditional insights that may have been **lost in translation**.



Human
experience
of
herbal medicines



Human experience of herbal medicines

Without modern investigative and analytical techniques health care practitioners were forced to make empirical observations of each human ecosystem that was presented to them, and to devise strategic interventions at that level.

The pattern of response to the illness was more important than the illness itself. Medicines evolved to correct pattern disturbances.

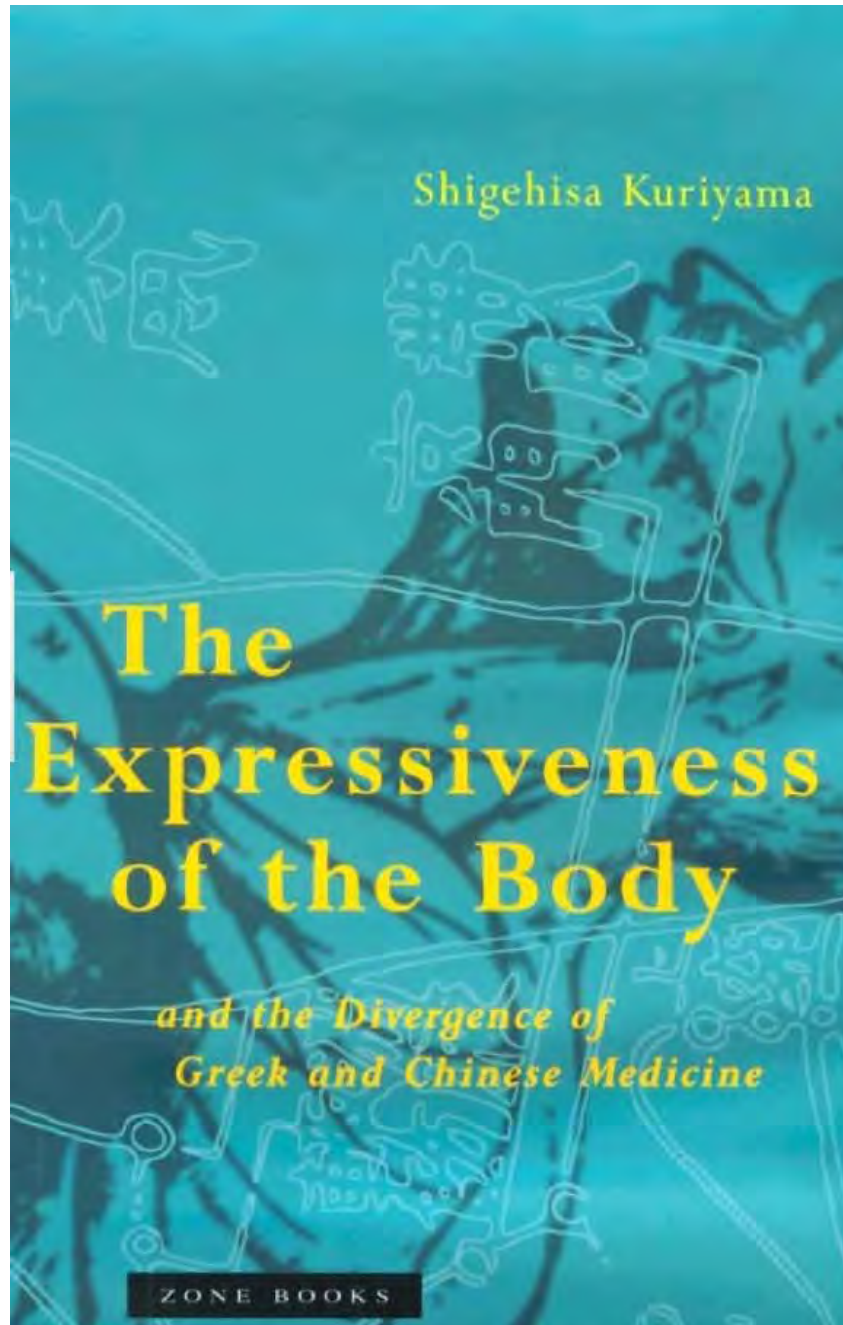
The language of assessment was simple: body fluids, humours, *chymoi*, *doshas*, sweat, blood, excretions ...

It was like reading the internal weather, tides and seasons.



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and this is a

MUST READ!

starting with the common
currency:

the human body

Human experience of herbal medicines

There are some potentially valuable different approaches to health care here.

Maybe relevant again in a post-modern age of increasingly recalcitrant long term conditions.

Let us glimpse some of the old potencies ...



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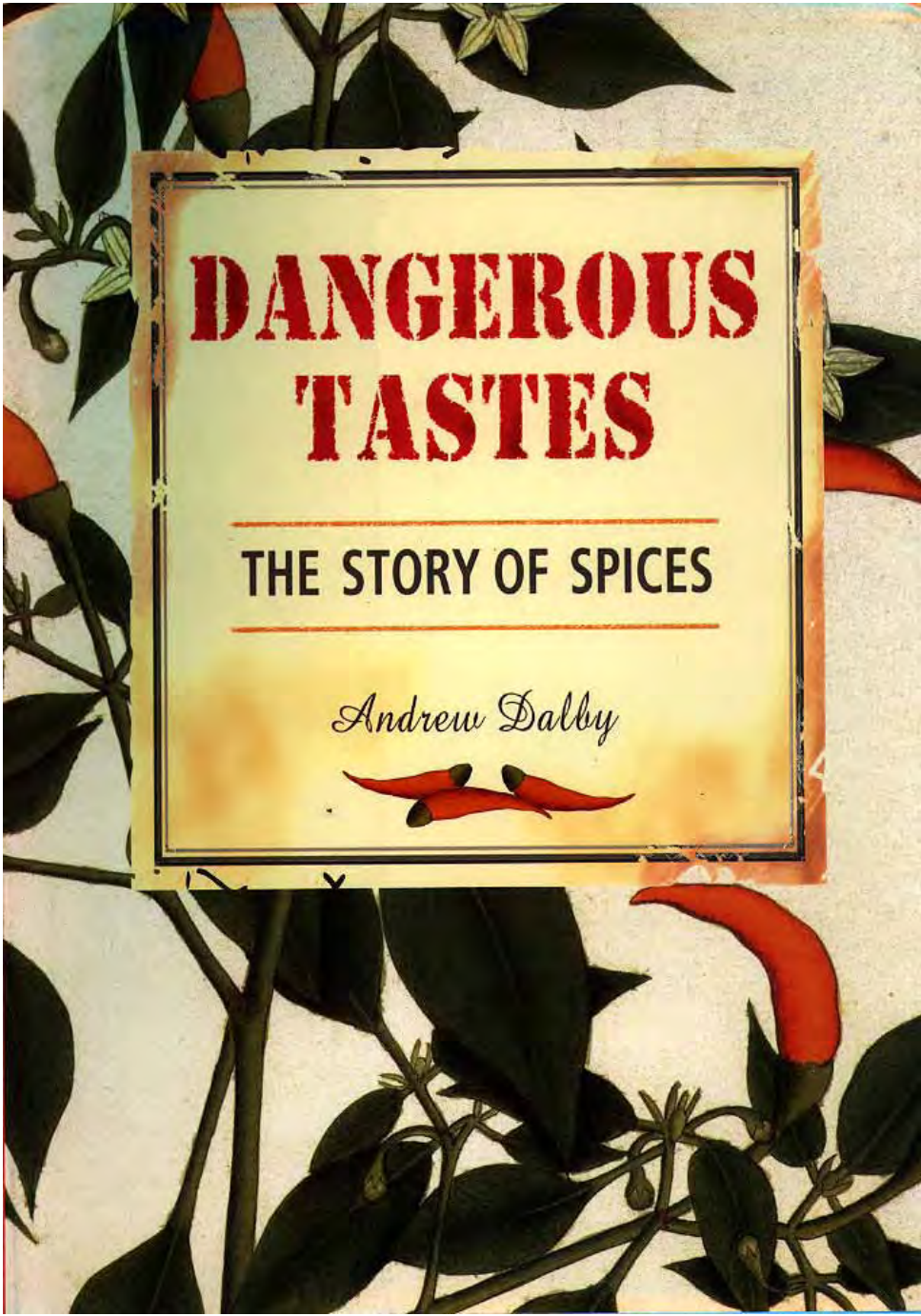


Cinnamon
Cinnamomum zeylanicum Nees
C. verum J.S. Presl



In search of spices







Cloves (*Eugenia caryophyllum* L)



Ginger (*Zingiber officinale* L)



Turmeric (*Curcuma longa* L)



Black pepper (*Piper nigrum* L)



**Turmeric
(*Curcuma longa* L)**



**Cardamom
(*Elettaria cardamomum* L)**

Cinnamon



The intoxicating aroma of the freshly pressed bark of these tropical shrubs ensured that they became one of the most mysterious and valuable spices in history.

Cinnamon uniquely combines a spicy warmth with sweetness. It has both a very pleasant taste and aroma and also an impressive reputation for health benefit.



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Cinnamon



Three species most often used

Ceylon cinnamon (*Cinnamomum verum* J.S. Presl)

Strongly aromatic, spicy, sweet, warm, barely bitter or astringent.
Primarily inner bark without presence of outer bark and cortex.

Cassia (*C. cassia* [L.] Presl)

Aromatic, sweet, warm, but slightly bitter, astringent and mucilaginous.
More bitter and astringent than Ceylon cinnamon. Often presence of outer bark and cortex.

Indonesian cinnamon (*C. burmannii* [Nees & T.Nees] Blume)

Strongly aromatic; similar qualities to Ceylon cinnamon but less stimulating, low bitterness and astringency.



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Cinnamon



Ceylon Cinnamon

Essential oil 0.5-2.5% (cinnamaldehyde 55-75%; linalool 1-6%, beta-caryophyllene 1-4%, eugenol <7.5%, 1,8 cineole <3%, safrole <0.5%)

Diterpenes: cinnzeylanine, cinnzeylanol

Polysaccharides: water-insoluble glucan, arabinoxylan

Mucilage: 1.5-3%

Phenolic acids: cinnamic acid 0.05%

Condensed tannins

Proto-tannins: epicatechin and various derivatives

Cassia

Essential oil 1-3% (cinnamaldehyde 80-97%; trace alpha-copaene, delta-cadinene, cinnamyl acetate, benzaldehyde, no eugenol)

Coumarin 0.14-1.1%

Diterpenes: cinnzeylanine, cinnzeylanol, cinnassols A-D₄)

Polysaccharides: arabinoxylan

Mucilage: <10%

Condensed tannins

Proto-tannins: epicatechin and various derivatives

Phenolic acids: cinnamic acid

Indonesian Cinnamon

Essential oil 1-4% (cinnamaldehyde 75%, no eugenol).

Mucilage 8%



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Cinnamon



Research points to a potential role in reducing the problems of insulin resistance, blood sugar imbalances and even diabetes itself.

The evidence for these benefits in humans is still in balance and has overlooked the extraordinary reputation cinnamon has as a warming digestive, with likely benefits also for circulatory health and resistance to infections.



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Cinnamon



Cinnamon in China

Properties: acrid, sweet, hot

Primarily warming: good for inducing perspiration and promoting circulation. In the 3rd century text *Shang Han Lung* (on Cold damage) cinnamon is the classic remedy against “*external deficient Yang* patterns” marked by aversion to wind and cold, cold hands and feet, headache, pain and stiffness in the back of the neck, nasal congestion.

It is said also to “warm the *Spleen* and disperse Cold”: signs include cold-induced stomach ache, abdominal pain and loose bowels. Carminative and digestive stimulant properties were widely understood.

In folk medicine the bark was employed as an astringent and in remedies for coughs and chest complaints.

It was not recommended for pregnant women as it was said to promote menstruation and was used after childbirth.



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Cinnamon



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EXTRACT[®] rating of benefits

Activity	Science RATING	Expert RATING	Application
Digestive	F	B+	Poor digestive performance
Carminative	F	B+	Colic, gas, irritable bowel
Circulatory stimulant	F	B+	Effect of cold
Astringent	F	C-	Irritated upper digestive lining
Antifungal/antimicrobial	E+	C-	Food preservation benefits possible; possible topical benefits in lowered immune states
Hypoglycemic	D-	D+	Not sufficient evidence to recommend
Diabetic treatment	F	E+	Not sufficient evidence to recommend
Insulin sensitivity increase	D-	D-	Not sufficient evidence to recommend
Antioxidant	D+	D+	No clear therapeutic application
Hypotensive	D-	D+	Not sufficient evidence to recommend

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Spices in traditional medicine

Hot, heating, or warming in every early medical tradition

- = thermogenesis
- = increased circulatory flow
- = vasodilation
- = increased tissue perfusion > preventing pathology
- = substituting for inflammation?



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Some traditional approaches to disease

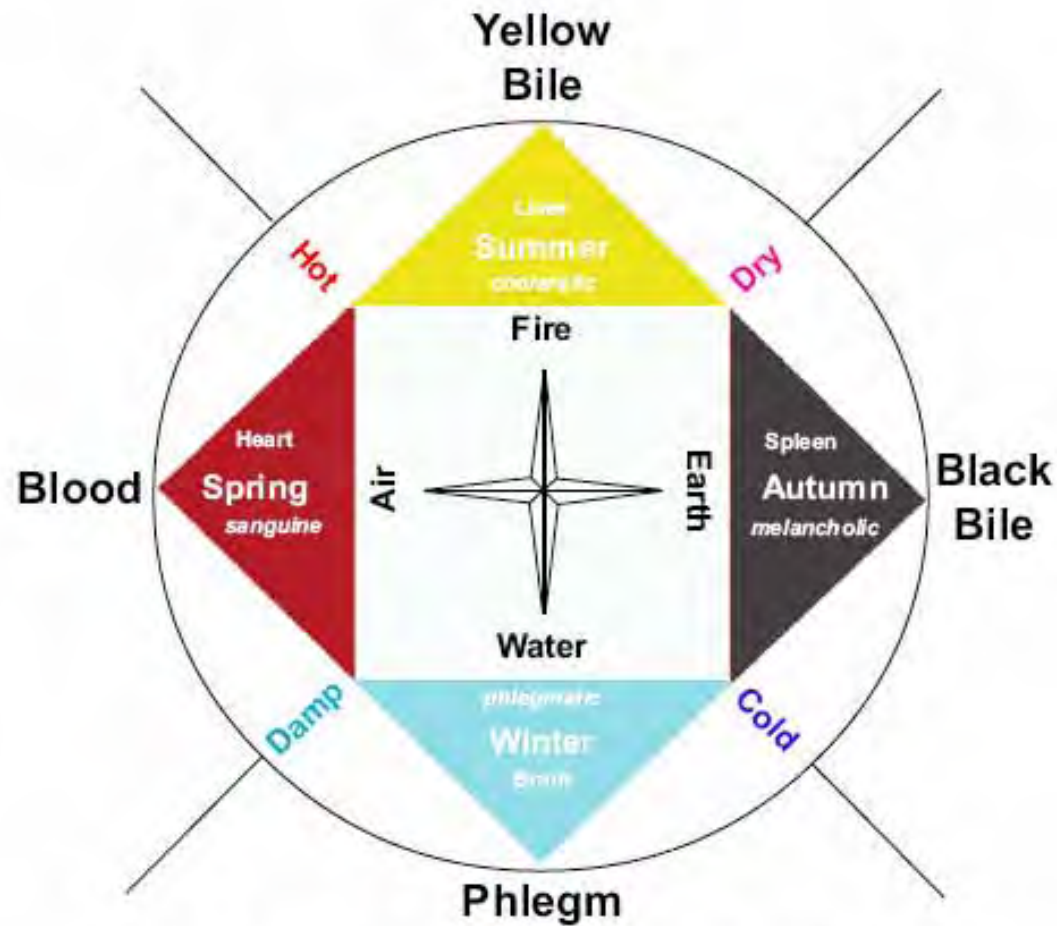
Disease and constitutional disturbances were understood in the past in every day language, like the weather:

- hot
- cold
- damp
- dry



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The Four Humours (fluids) of Ancient Greece
 and their relationship with
 the Four Elements
 the Four Temperaments
 the Four Personalities
 the Four Organs
 and
 the Four Seasons



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Some traditional approaches to chronic inflammatory disease

Heat (youth and *the extent of inflammatory reaction*)

- a mark of vigorous defence
- when stuck or marked by destructive symptoms (allergic reactions or eczema) it signifies 'blocked toxins'.
- with dryness, could be asthma, allergic rhinitis or hayfever, dry eczema and/or constipation;
- with damp the liver and digestion would be involved

Traditional approaches: 'cooling' and 'clearing' remedies (incl. laxatives, choleric, lymphatics).



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Wormwood (*Artemisia absinthium* L)



Some traditional perspectives

Cold (age and *the degree of physiological depression and morbidity*)

- diminished vitality > death
- faltering of the metabolic furnace, generally or locally.
- with damp leading to bronchitis and arthritis
- with dry associated with ageing

Traditional approaches: 'heating' (acid or aromatic digestives) either systemically or as hot topical applications as long as debility is not too extreme.



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Some traditional perspectives

Damp (*tissue congestion or chronic infection*)

- toxic congestion, stagnation, brackishness, mould, poor circulation
- exacerbated by external climatic dampness.
- with cold moves to the lungs, joints and lower regions, associated with sluggish digestion and congested abdomen.
- with heat involves the liver, intolerance to fats, rich food and alcohol, and perhaps a history of jaundice/hepatitis

Traditional approaches: 'drying' remedies: **acrids** and **warming aromatics** for cold-damp, and **bitters** for hot-damp conditions.



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Some traditional perspectives

Dry (*atrophy and ageing*)

- mucosal irritability and dryness
- exacerbated by external climatic dryness.
- with heat associated with allergies and hypersensitivities.
- with cold associated with many ageing symptoms, also constipation

Traditional approaches: 'moistening' remedies (notably licorice): mucilages for hot-dry, and selected tonics for cold-dry conditions.



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Some traditional perspectives

Wind (*the degree of fluctuation*)

- the universal metaphor of change
- occurs with the juxtaposition of hot and cold
- marked by fluctuation of symptoms
- often associated with damp
(especially in rheumatic disease)

Traditional approaches: 'cooling' and 'warming' remedies discreetly applied to correct underlying imbalances of hot and cold.



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Some traditional approaches

The vital importance of planned **convalescent** strategies

- rest
- exercises
- supportive diet
- 'tonic' plant medicines

in the complete recovery from illness and
to avoid long-term relapsing conditions.



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Some traditional approaches

The link between **debility** and

- menopausal symptoms
- sleepless nights
- susceptibility to infections



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Some traditional approaches

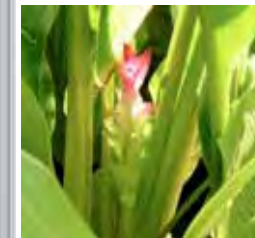
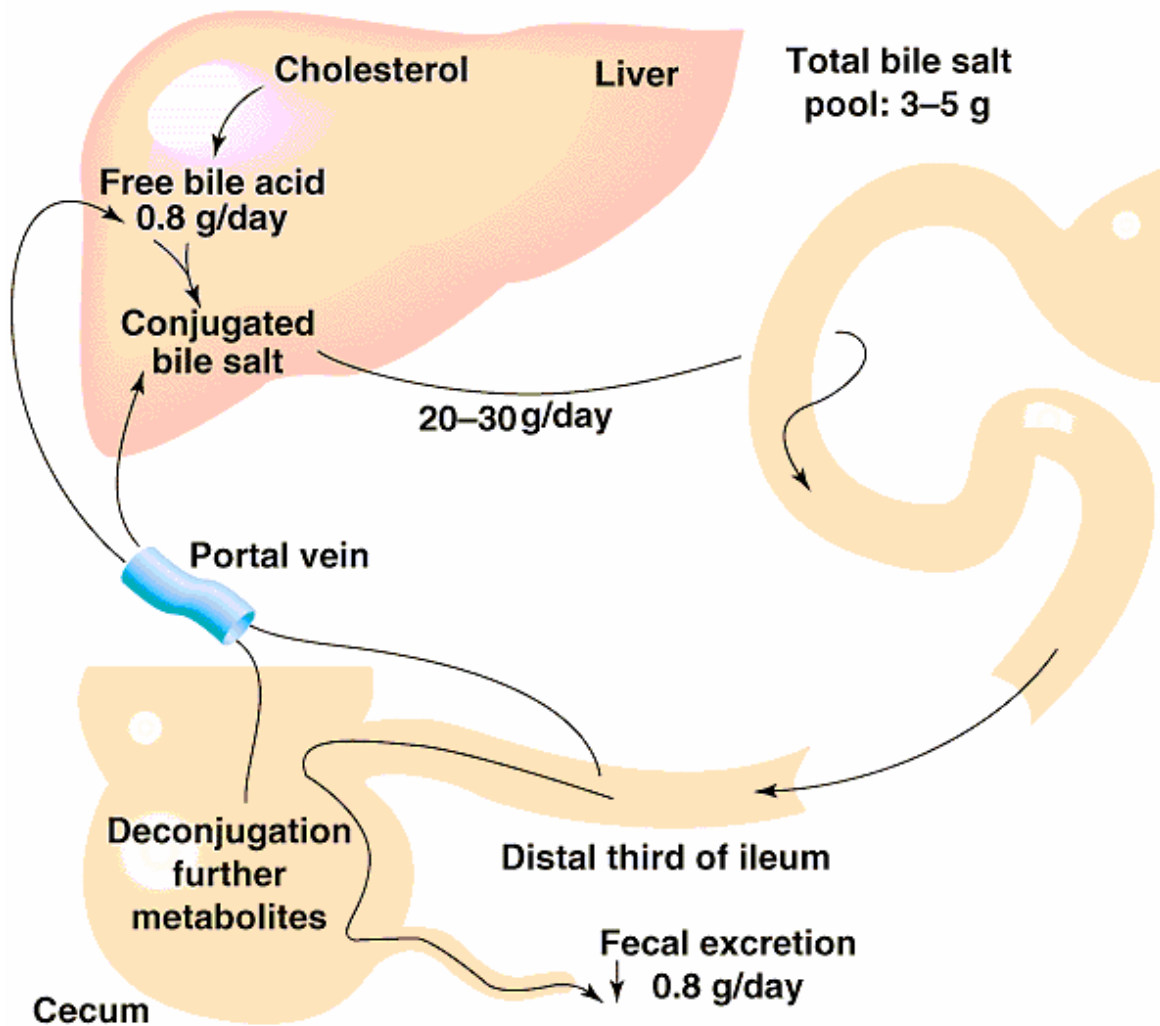
- The use of **digestive stimulants** ('hot' spices or 'cold' bitters depending on the person's constitution) to improve a wide spectrum of health measures, notably those in modern times linked to food intolerances and disturbed lower digestive functions.
- The links between **digestive and bowel health** and **respiratory** illness (and the strong overlap between traditional remedies for both).
- The role of the **biliary** system (and choleric plant remedies) in maintaining **bowel** function.



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The Biliary System



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Some traditional approaches

- The search for causes of skin disease in the interior rather than on the surface.



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Some traditional approaches

- The crucial importance of good **circulation** in preventing disease and maintaining cognitive performance.
- The fundamental role of **improving circulation (heating)** in managing inflammations and fevers!



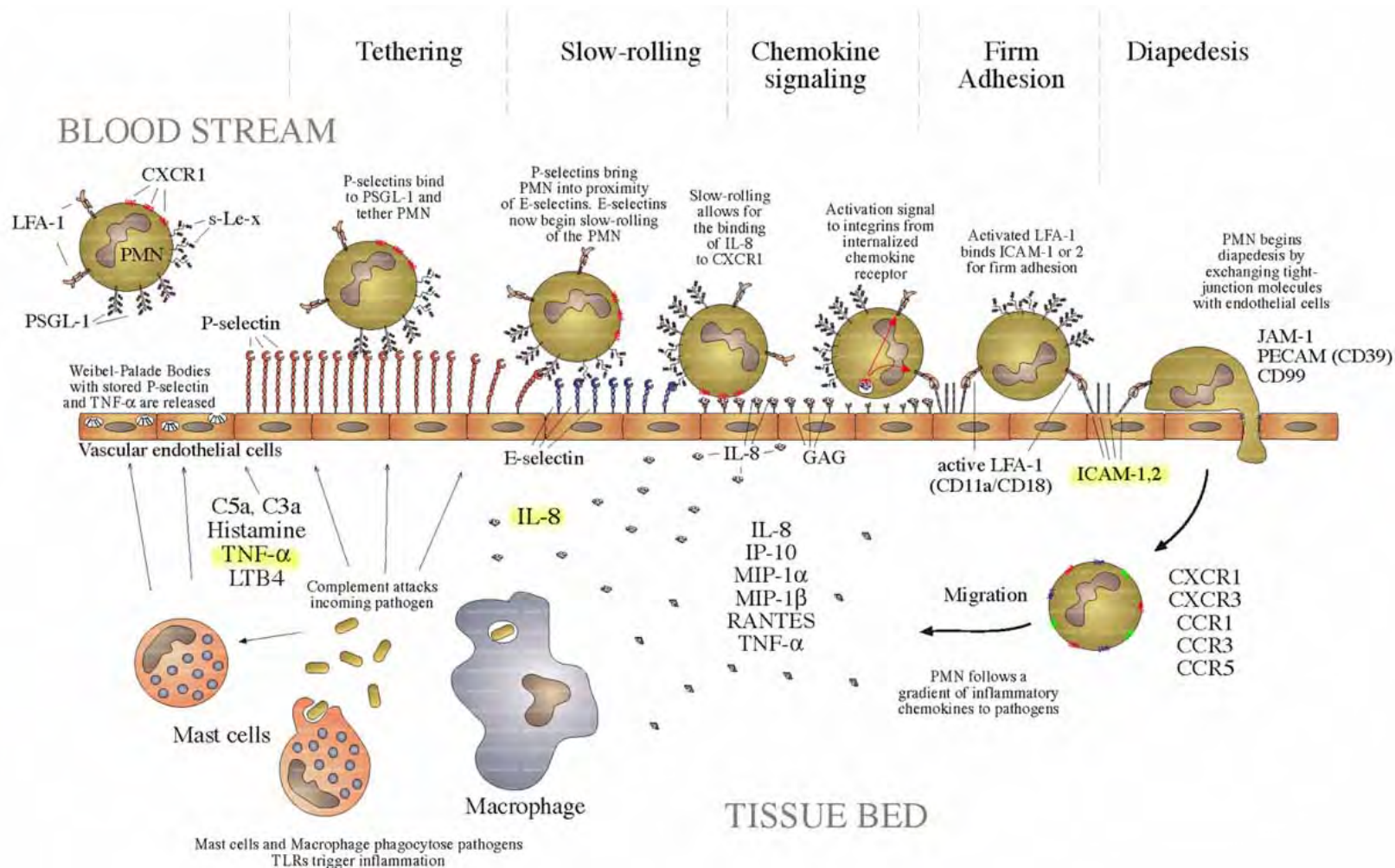
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Traditional leads for managing inflammatory disease

Remember extravasation – the first stage in inflammation?



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Spice constituents shown to inhibit migration through inflamed endothelial cells



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Spice	Active constituents	Inflammatory mediators affected
Cayenne	capsaicin, apigenin	TNF- α , IL-8, IL-10
Cardamom		NO
Cinnamon	cinnamaldehyde	TNF- α
Cloves	eugenol	TNF- α , IL-1 β
Garlic	allicin, ajoene, diallyl sulfide, apigenin	TNF- α , IL-1 β , IL-6, IL-8, ICAM
Ginger	6-gingerol, zingiberone	TNF- α , IL-1 β , IL-12, NO
Horseradish, mustard	allyl isothiocyanate	TNF- α , NO
Nutmeg	myristicin	TNF- α
Pepper	piperine	TNF- α , IL-1 β , IL-6, NO
Turmeric	curcumin	TNF- α , NO
Culinary herbs	apigenin, quercetin, chlorogenic and rosmarinic acids	TNF- α , IL-1 β , NO, ICAM



Plant constituents with effect on inflammatory mediators

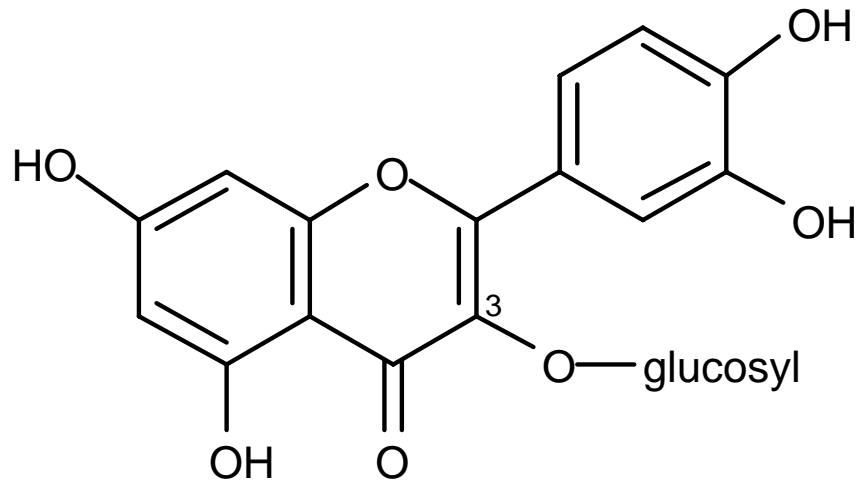
ajoene	garlic	Inhibits tumor-endothelial cell adhesion, as well as the <i>in vivo</i> TNF- α response
allicin	garlic	Inhibits the spontaneous and TNF- α -induced secretion of IL-1 β , IL-8, IP-10 and MIG from intestinal epithelial cells <i>in vitro</i> , suppresses the expression of IL-8 and IL-1 β mRNA levels.
allyl isothiocyanate	garlic	Significantly inhibits the cellular production of TNF- α and NO.
anethole	anise/fennel	Inhibits NF-kB activation induced by TNF, TRAF2, and NIK <i>in vitro</i> .
apigenin	celery etc	Inhibits TNF- α in LPS stimulated macrophages resulting in diminished MCP-1 and inhibition of IL-1 β <i>in vitro</i> .
capsaicin	cayenne	Blocks the STAT3 activation pathway in multiple myeloma cells <i>in vitro</i> leading to down-regulation of cyclin D1, Bcl-2, Bcl-xL, survivin, and VEGF.
carnosol	rosemary	Decreases LPS-induced iNOS mRNA and protein expression, reduces NF-kB activity, inhibits iNOS and NF-kB promoter activity.
caryophyllene	cloves/rosemary	Inhibits the LPS-induced NF-kB activation.
cinnamaldehyde	cinnamon	Inhibits age-related NF-kB activation and targets inflammatory iNOS and COX-2
curcumin	turmeric	Down-regulates NF-kB, decreases expression of NF-kB-target genes COX-2 and cyclin D1, Inhibits the cellular production of TNF- α and NO.
diallyl sulfide	garlic	Significantly reduces the production of and serum levels of IL-1 β , IL-6, TNF- α and GM-CSF in mice with melanoma.
eugenol	cloves	Blocks the release of IL-1 β , TNF- α , and prostaglandin E2 and suppresses the mRNA expression of IL-1 β , TNF- α , and COX-2 in LPS-stimulated human macrophages <i>in vitro</i> .
[6]-gingerol	ginger	Inhibits the production of TNF- α , IL-1 β , and IL-12 in murine peritoneal macrophages
humulene	hops	Inhibits the LPS-induced NF-kB activation and neutrophil migration in oedema, prevents the production of TNF- α and IL-1 β and the <i>in vivo</i> up-regulation of kinin B(1) receptors.
limonene	citrus fruitc	Inhibits the LPS-induced inflammation including cell migration and production of NO along with significant inhibition of g-interferon and IL-4 production in mouse model of pleurisy.
perillyl alcohol	citrus/caraway	Reduces NF-kB DNA-binding activity.
phytic acid	cereals	Modulates IL-8 and IL-6 release from colonic epithelial cells stimulated with LPS and IL-1 β , suppresses IL-8 basal release, and reduces IL-8 secretion by colonocytes and down-regulates IL-6.
piperine	peppers	Significantly reduces the expression of IL-1 β , IL-6, TNF- α GM-CSF and IL-12p40 genes in melanoma cells.
quercetin	all plants	Attenuates PMACI-induced activation of NF-kB; inhibits LPS-induced nitric oxide and tumor necrosis factor-alpha production
ursolic acid	apple/many herbs	Inhibits IKK and p65 phosphorylation leading to the suppression of NF-kB activation induced by various carcinogens; this correlates with the down-regulation of COX-2, MMP- 9, and cyclin D1 <i>in vitro</i> .
zingerone	ginger	Significantly inhibits the cellular production of proinflammatory mediators such as TNF- α and NO and inhibits the release of MCP-1 from 3T3-L1 adipocytes.



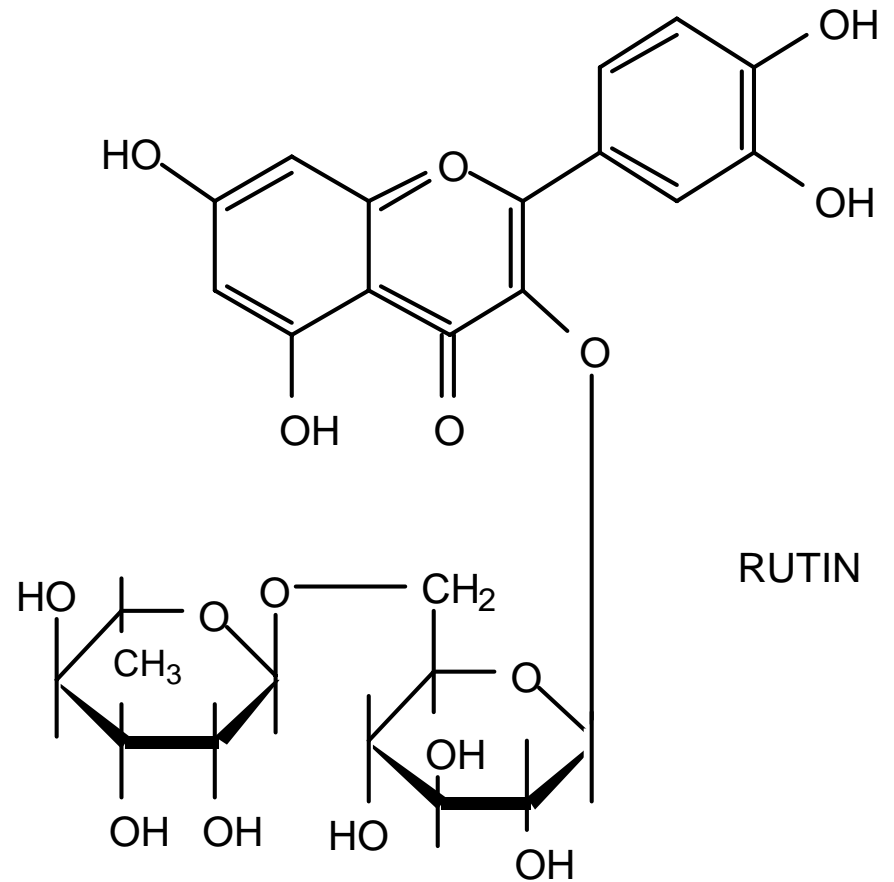
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Flavonoids

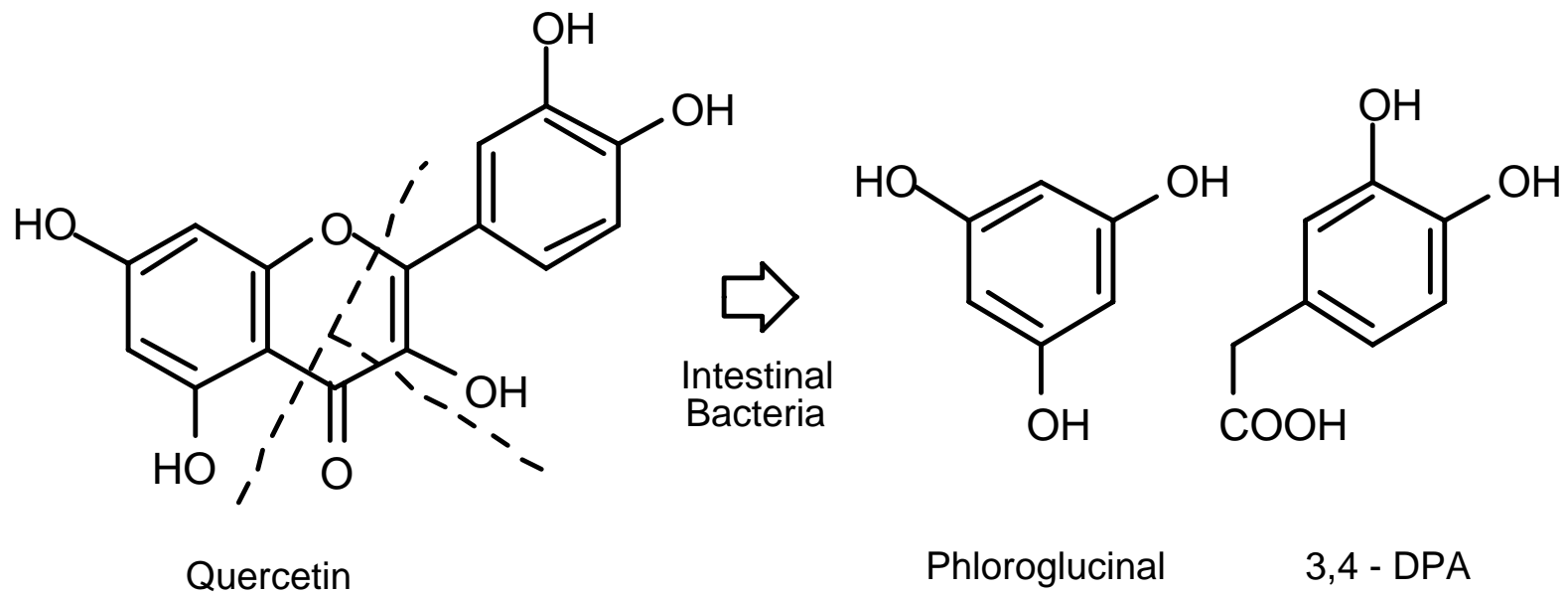


Quercetin 3-glucoside



Bacterial C-cleavage

- the mobilisation of flavonoids?



New endothelial frontline

- atherosclerosis
- insulin resistance
- diabetes



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New endothelial herbal prospects

- Cinnamon *Cinnamomum spp*
- Garlic *Allium sativum*
- Ginkgo *Ginkgo biloba*
- Hawthorn *Crataegus spp*
- Rosemary *Rosmarinus officinalis*
- Turmeric *Cucurma longa*



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New herbal prospects in inflammatory disease

- Ash *Fraxinus excelsior*
- Black cohosh *Actaea racemosa*
- Bogbean *Menyanthes trifoliata*
- Devil's claw *Harpagophytum procumbens*
- Feverfew *Tanacetum parthenium*
- Frankincense *Boswellia serrata*
- Lignum vitae *Guaiacum spp*
- Poplar bark *Populus spp*
- Rosehip *Rosa canina*
- Willow bark *Salix spp*



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ONLINE
SERIES

The Scientific Foundation for Herbal Medicinal Products

Cimicifugae rhizoma
Black Cohosh

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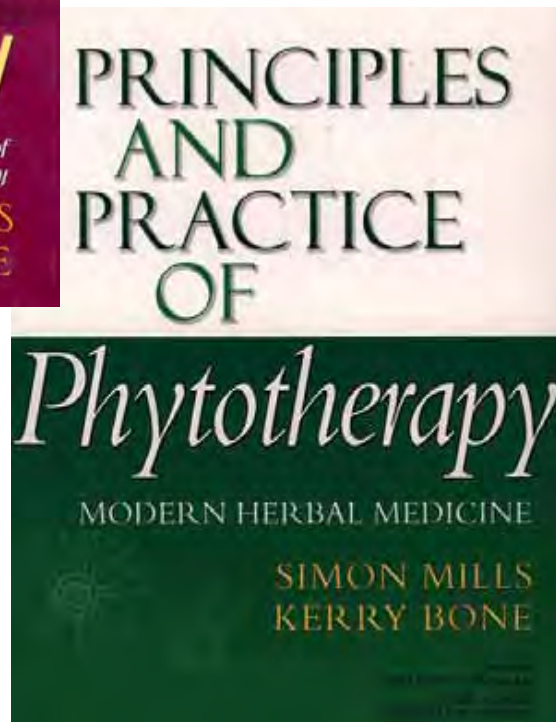
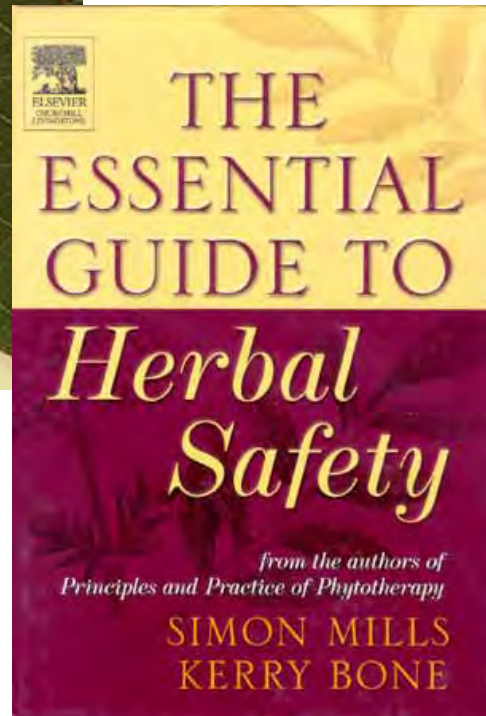
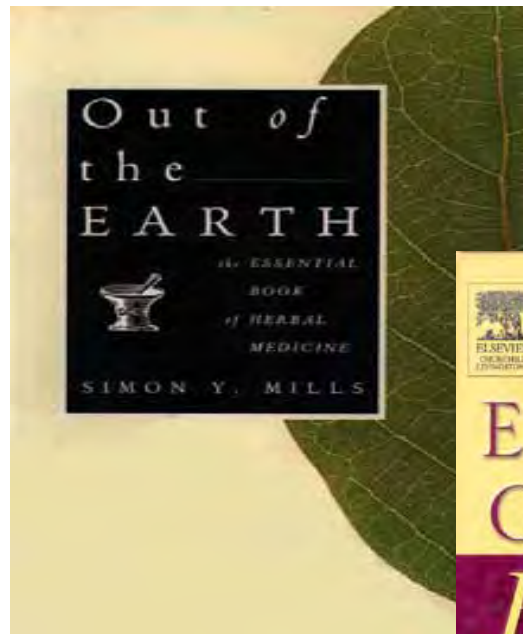
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Further reading ...

*New edition
coming soon!*

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