

Green Guard

Plant part: Leaf

Scientific name: *Urtica dioica*

INCI name: Urtica Dioica (Nettle) Leaf Extract

IECIC 2015 name: URTICA DIOICA (NETTLE) LEAF EXTRACT



Green Guard

Product Name: Green Guard

Plant Name: Nettle

Urtica dioica, also known as the Stinging Nettle is a perennial plant, with *Urtica* being 'uro' in Latin, which means burning or tingling. It grows wildly throughout the temperate world, and supplies a variety of minerals such as magnesium, phosphorus, potassium and calcium, and is known to contain carotene, acetylcholine, vitamins A and C.



Harvesting Nettle

The nettle leaves we use in our herbal extracts at The Secrets of Caledonia are organically grown on a local farm in Fife.

The farmers always look for ways to grow sustainably and produce as little waste as possible, in line with our company values.



Traditional Use

Nettle has long been used in traditional herbal medicine, commonly brewed in tea to obtain a high extraction of minerals, particularly magnesium. Historically, the leaves were used in a hair tonic and to treat inflammatory diseases such as arthritis and itchy skin from eczema. Nettle leaf extracts have been found to contain high levels of caffeic acid, chlorogenic acid and several flavonoids. Many *in vitro* and *in vivo* studies demonstrate anti-inflammatory, antioxidant and antimicrobial activities, with recent studies reporting anti-ageing effects through the inhibition of elastase and collagenase enzymes.

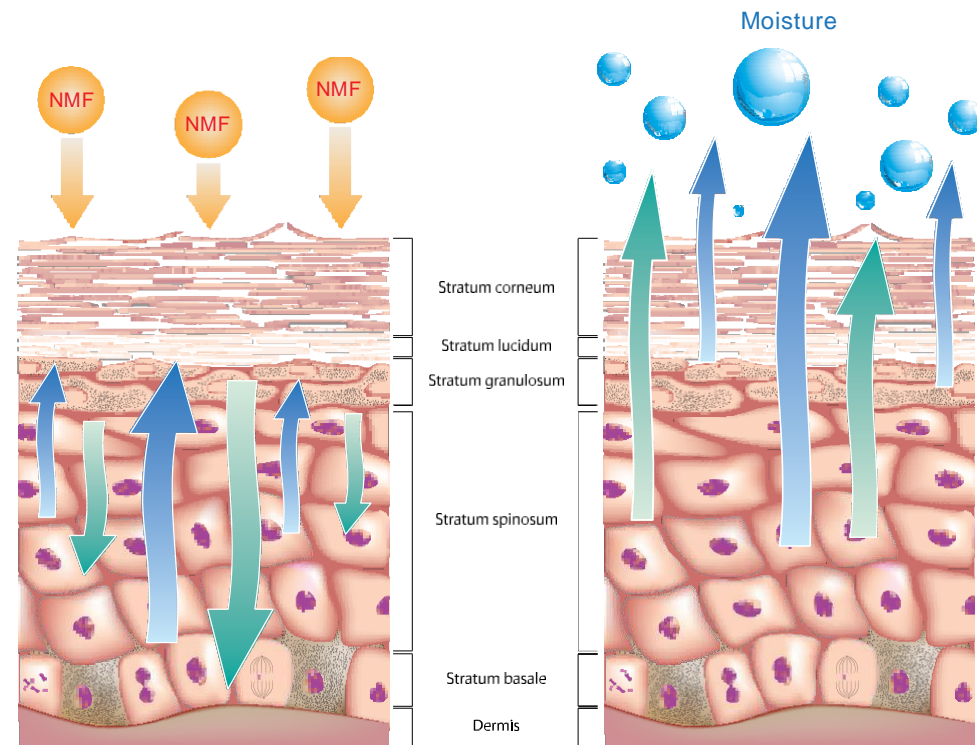
[1] Antimicrobial activity of methanolic extracts of Sambucus ebulus and Urtica dioica against clinical isolates of methicillin resistant S. aureus, Salehzadeh et al., Afr J Tradit Complement Altern Med, 2014, 11(5), p.38-40

[2] Introducing Urtica dioica, a native plant of Khuzestan, as an antibacterial medicinal plant, Motamedi et al., Jundishapur J Nat Pharm Prod, 2014, 9(4), e15904

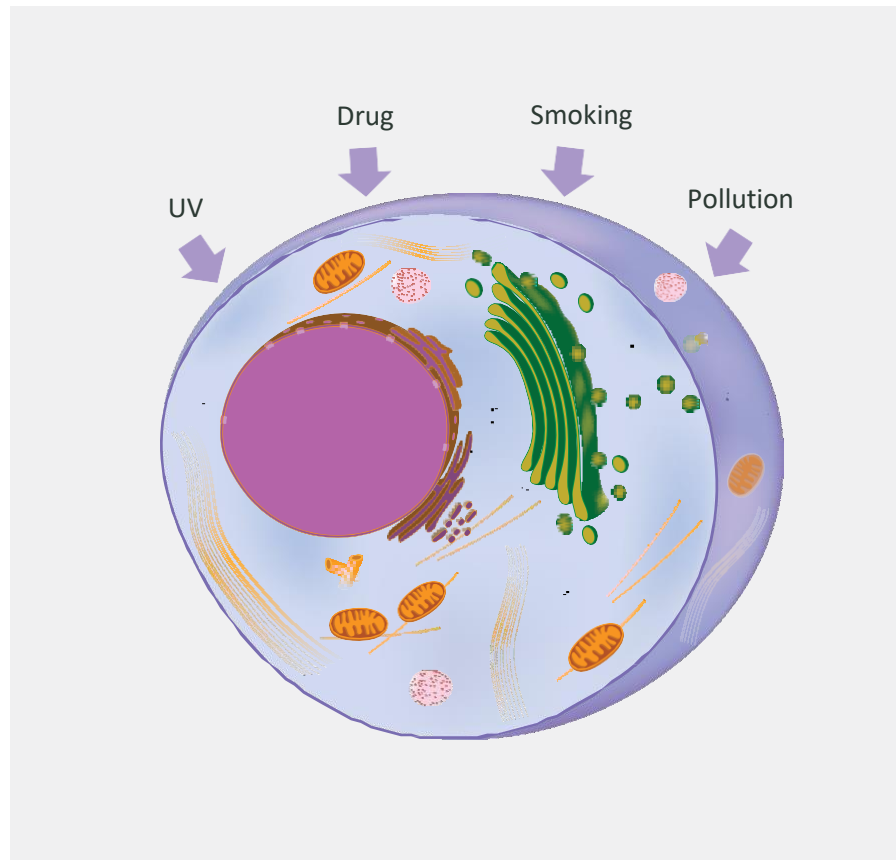
[3] Inhibition of cytosolic phospholipase A2 α (cPLA2 α) by medicinal plants in relation to their phenolic content, Arnold et al., Molecules, 2015, 20(8), p.15033-15048

Skin Structure

The retention of water in the Stratum corneum (SC) is dependent on two major components: (1) the presence of natural hygroscopic agents within the corneocytes (collectively referred to as natural moisturizing factor) and (2) the SC intercellular lipids orderly arranged to form a barrier to transepidermal water loss (TEWL). The water content of the SC is necessary for proper SC maturation and skin desquamation. Increased TEWL impairs enzymatic functions required for normal desquamation resulting in the visible appearance of dry, flaky skin.



Antioxidants

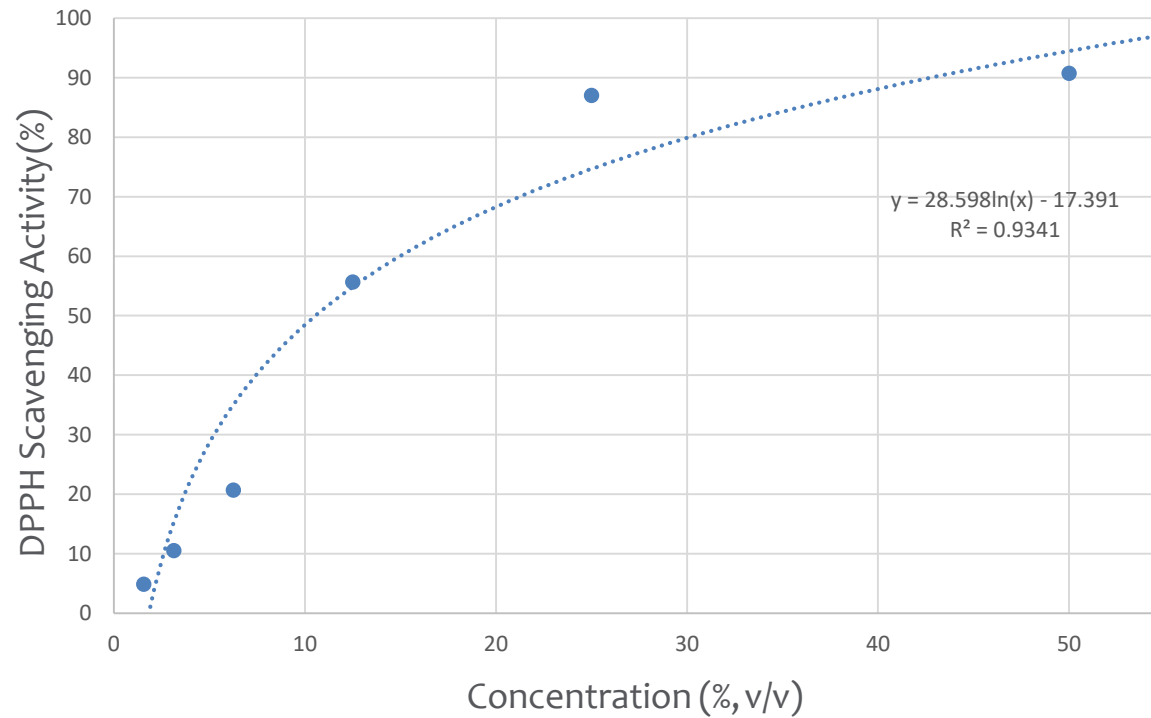


Why are they important?

Our skin is under attack from many factors in daily life, such as UV, pollution, and smoking. These factors increase the Reactive Oxygen Species (ROS).

Antioxidants from *Urtica Dioica* (Nettle) Leaf Extract can inhibit the generation of ROS and turn to inhibit cellular damage.

Antioxidant Effects of Green Guard (*in vitro*)



SC₅₀: 1.14%

In our test, 1.14% of Green Guard was enough to remove 50% of free radicals.
-> Good anti-oxidant activity is critical for anti-ageing agents in skin care products.

Scientific Research

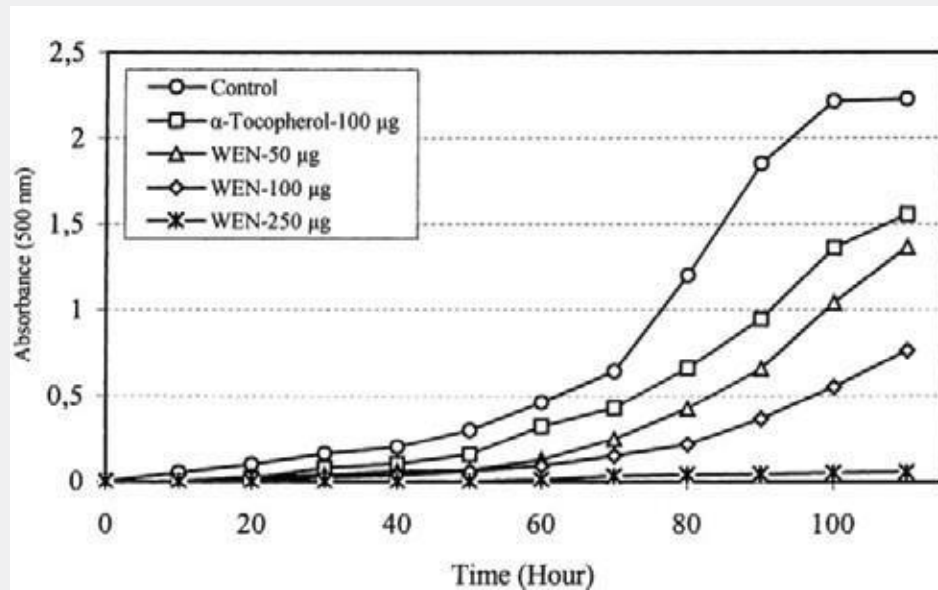


Fig. 1. Antioxidant activity of different doses of WEN and α -tocopherol in the linoleic acid emulsion was determined by the thiocyanate method. The indicated amounts of dried extract of WEN were presented in 5 ml of linoleic acid emulsion. The control was the linoleic acid emulsion without WEN extract. Results are average of duplicate experiments (WEN: water extract of nettle).

Scientific reports on the antioxidant activities of nettle extract are available. The mechanisms of its activity may include activity against various oxidative systems in vitro; strong hydrogen donating ability, a metal chelating ability, and their effectiveness as scavengers of hydrogen peroxide, superoxide, and free radicals. Phenolic compounds appear to be responsible for the antioxidant activity.

[4] Gülçin, İ., Küfrevioğlu, Ö., Oktay, M. and Büyükkuroğlu, M. (2004). Antioxidant, antimicrobial, antiulcer and analgesic activities of nettle (*Urtica dioica* L.). *Journal of Ethnopharmacology*, 90(2-3), pp.205-215.

Antimicrobial Properties of Nettle

Table 1
Antimicrobial activities of WEN (250 µg per disc), and miconazole nitrate, amoxicillin-clavulanic acid, ofloxacin, and netilmicin

Microorganisms	Diameter of zone of WEN (mm)	Antimicrobial agent (mm)			
		MN	ACA	O	N
<i>Pseudomonas aeruginosa</i>	ND	–	ND	ND	10
<i>Escherichia coli</i>	8	–	15	23	25
<i>Proteus mirabilis</i>	8	–	24	26	25
<i>Citrobacter koseri</i>	9	–	22	15	24
<i>Staphylococcus aureus</i>	8	–	15	12	27
<i>Streptococcus pneumoniae</i>	9	–	15	24	18
<i>Enterobacter aerogenes</i>	9	–	12	23	23
<i>Micrococcus luteus</i>	13	–	19	20	22
<i>Staphylococcus epidermidis</i>	11	–	24	21	25
<i>Candida albicans</i>	8	20	–	–	–

WEN: water extract of nettle; MN: miconazole nitrate (40 µg per disc); ACA: amoxicillin-clavulanic acid (20–10 µg per disc); O: ofloxacin (5 µg per disc); N: netilmicin (30 µg per disc); ND: not detected activity at this amount of WEN or standards.

The results were recorded by measuring the zones of growth inhibition surrounding the disc. Clear inhibition zones around the discs indicated the presence of antimicrobial activity.

Nettle extract displayed significant antimicrobial activity against Gram-positive and -negative bacteria when compared with standard and strong antimicrobial compounds such as miconazole nitrate, amoxicillin-clavulanic acid, ofloxacin, and netilmicin.

[4] Gülçin, İ., Küfrevioğlu, Ö., Oktay, M. and Büyükkuroğlu, M. (2004). Antioxidant, antimicrobial, antiulcer and analgesic activities of nettle (*Urtica dioica* L.). *Journal of Ethnopharmacology*, 90(2-3), pp.205-215.

Reported functions

Ingredient : URTICA DIOICA

INCI Name	URTICA DIOICA
Description	Urtica Dioica is the dried material obtained from the Nettle, Urtica dioica L., Urticaceae
INN Name	
Ph. Eur. Name	
CAS #	84012-40-8
EC #	281-685-5
Chemical/IUPAC Name	
Cosmetic Restriction	
Other Restriction(s)	
Functions	<ul style="list-style-type: none"> • HAIR CONDITIONING
SCCS opinions	
Identified INGREDIENTS or substances e.g.	

Source: European Commission [http://ec.europa.eu/growth/tools-databases/cosing/index.cfm?fuseaction=search.details_v2&id=38844]

Product Information

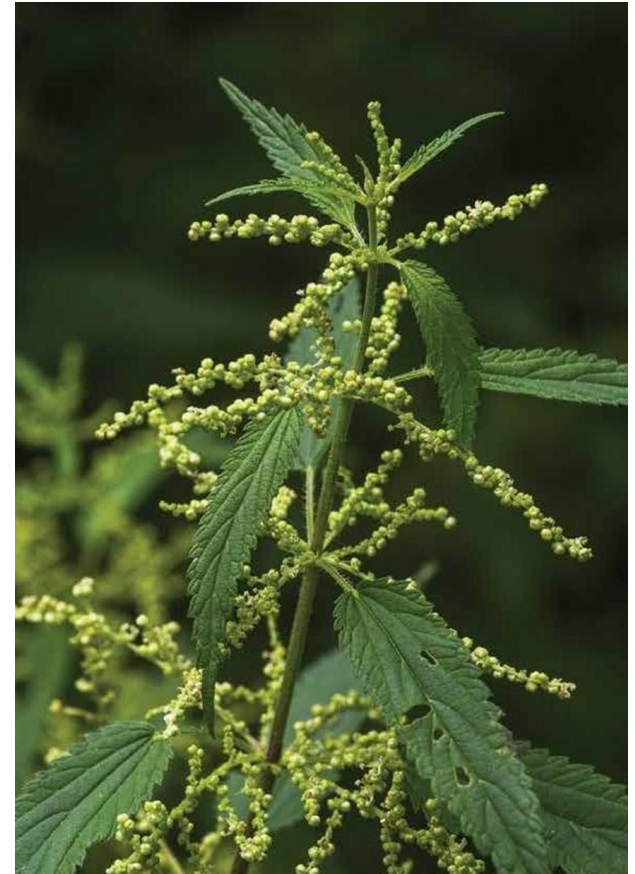
Product Name : Green Guard


INCI name : Urtica Dioica (Nettle) Leaf Extract
(China Compliant)

Dosage : 1 – 3%

Formulation : Add to the formulation
when the temperature is lower than 55°C.
Recommended to add after the cooling process.

Storage : Avoid direct light or UV.
Keep it in a cool and dry area.





The Secrets of Caledonia

The Secrets of Caledonia (TSOC) is a supplier of natural cosmetic ingredients inspired by Scottish traditional herbal medicine. Taking advantage of Scotland's biodiversity and working in collaboration with established Scottish herbalists, we aim to provide the most effective and innovative natural ingredients at the highest quality.



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