[Template:Hatnote](/wiki/Template:Hatnote" \o "Template:Hatnote) [Template:Taxobox](/wiki/Template:Taxobox)

[thumb|Borago officinalis](/wiki/File:Borretsch_-_Borago_officinalis.jpg)

**Borage** ([Template:IPAc-en](/wiki/Template:IPAc-en),[[1]](#cite_note-1) ***Borago officinalis***), also known as a **starflower**, is an annual [herb](/wiki/Herb) in the [flowering plant](/wiki/Flowering_plant) family [Boraginaceae](/wiki/Boraginaceae). It is native to the [Mediterranean](/wiki/Mediterranean) region and has naturalized in many other locales.[[2]](#cite_note-2) It grows satisfactorily in gardens in the UK climate, remaining in the garden from year to year by self-seeding. The leaves are edible and the plant is grown in gardens for that purpose in some parts of Europe. The plant is also commercially cultivated for [borage seed oil](/wiki/Borage_seed_oil) extracted from its seeds.

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## Description[[edit](/index.php?title=(none)&action=edit&section=1)]

*Borago officinalis* grows to a height of [Template:Convert](/wiki/Template:Convert), and is bristly or hairy all over the stems and [leaves](/wiki/Leaf); the leaves are [alternate](/wiki/Alternate_leaf), [simple](/wiki/Simple_leaf), and [Template:Convert](/wiki/Template:Convert) long. The [flowers](/wiki/Flower) are [complete](/wiki/Complete_flower), [perfect](/wiki/Perfect_flower) with five narrow, triangular-pointed [petals](/wiki/Petals). Flowers are most often blue, although pink flowers are sometimes observed. White flowered types are also cultivated. The blue flower is genetically dominant over the white flower.[[3]](#cite_note-3) The flowers arise along [scorpioid cymes](/wiki/Scorpioid_cyme) to form large floral displays with multiple flowers blooming simultaneously, suggesting that borage has a high degree of [geitonogamy](/wiki/Geitonogamy) (intra-plant pollination).[[3]](#cite_note-3) It has an indeterminate growth habit which may lead to prolific spreading. In temperate climate such as in the UK, its flowering season is relatively long, from June to September. In milder climates, borage will bloom continuously for most of the year.

## Characteristics and uses[[edit](/index.php?title=(none)&action=edit&section=2)]

[thumb|left||A white flower](/wiki/File:Borago_officinalis_white_flower.jpg) [cultivar](/wiki/Cultivar) [thumb|left|Two blossoms, the younger one is pink, the older blue](/wiki/File:Borago_officinalis,_two_blossoms.jpg) Traditionally borage was cultivated for culinary and medicinal uses, although today commercial cultivation is mainly as an oilseed. Borage is used as either a fresh vegetable or a dried herb. As a fresh vegetable, borage, with a [cucumber](/wiki/Cucumber)-like taste, is often used in salads or as a garnish.[[4]](#cite_note-4) The flower has a sweet honey-like taste and is often used to decorate [desserts](/wiki/Dessert) and cocktails.[[4]](#cite_note-4) Vegetable use of borage is common in Germany, in the Spanish regions of [Aragón](/wiki/Aragón) and [Navarra](/wiki/Navarra), in the Greek island of [Crete](/wiki/Crete) and in the northern Italian region of [Liguria](/wiki/Liguria). Although often used in soups, one of the better known German borage recipes is the [Green Sauce](/wiki/Green_Sauce) (Grüne Soße) made in [Frankfurt](/wiki/Frankfurt). In Italian [Liguria](/wiki/Liguria), borage is commonly used as a filling of the traditional pasta [ravioli](/wiki/Ravioli) and [pansoti](/wiki/Pansoti). It is used to flavour pickled [gherkins](/wiki/Gherkin) in [Poland](/wiki/Poland).[Template:Citation needed](/wiki/Template:Citation_needed)

Borage is traditionally used as a [garnish](/wiki/Garnish_(food)) in the [Pimms Cup](/wiki/Pimms_Cup) [cocktail](/wiki/Cocktail),[[4]](#cite_note-4) but is nowadays often replaced by a long sliver of cucumber peel or by [mint](/wiki/Mentha). It is also one of the key "Botanical" flavourings in [Gilpin's Westmorland Extra Dry Gin](/wiki/Gilpin's_Westmorland_Extra_Dry_Gin).

## Phytochemistry[[edit](/index.php?title=(none)&action=edit&section=3)]

The seeds contain 26-38% of [borage seed oil](/wiki/Borage_seed_oil), of which 17-28% is [gamma-linolenic acid](/wiki/Gamma-linolenic_acid) (GLA), the richest known source.[[5]](#cite_note-5) The oil also contains the [fatty acids](/wiki/Fatty_acids) [palmitic acid](/wiki/Palmitic_acid) (10-11%), [stearic acid](/wiki/Stearic_acid) (3.5-4.5%), [oleic acid](/wiki/Oleic_acid) (16-20%), [linoleic acid](/wiki/Linoleic_acid) (35-38%), [eicosenoic acid](/wiki/Eicosenoic_acid) (3.5-5.5%), [erucic acid](/wiki/Erucic_acid) (1.5-3.5%), and [nervonic acid](/wiki/Nervonic_acid) (1.5%). The oil is often marketed as "starflower oil" or "borage oil" for use as a GLA supplement, although healthy adults will typically produce ample GLA from dietary [linoleic acid](/wiki/Linoleic_acid).

The leaves contain small amounts (2-10 ppm of dried herb) of the [liver-toxic](/wiki/Hepatotoxicity) Pyrrolizidine alkaloids (PA) [intermedine](/wiki/Intermedine), [lycopsamine](/wiki/Lycopsamine), [amabiline](/wiki/Amabiline) and [supinineand](/wiki/Supinine) the non-toxic [saturated](/wiki/Saturation_(chemistry)) PA [thesinine](/wiki/Thesinine).[[6]](#cite_note-6) PAs are also present in borage seed oil, but may be removed by processing.<ref name=SK>[Borage](http://www.mskcc.org/mskcc/html/69148.cfm) at [Sloan-Kettering](/wiki/Sloan-Kettering) website</ref>[[7]](#cite_note-7)[[8]](#cite_note-8)[[9]](#cite_note-9)[[10]](#cite_note-10)[[11]](#cite_note-11) The German [Federal Institute for Risk Assessment](/wiki/Federal_Institute_for_Risk_Assessment) has advised that honey from borage contains PAs, transferred to the honey through pollen collected at borage plants, and advise that commercial honey production could select for raw honey with limited PA content to prevent contamination.[[12]](#cite_note-12)

## Herbal medicine[[edit](/index.php?title=(none)&action=edit&section=4)]

[thumb|right|](/wiki/File:Borage-aragonese_style600.JPG)[Aragonese cuisine](/wiki/Aragonese_cuisine). Borage boiled and sautéed with [garlic](/wiki/Garlic), served with [potatoes](/wiki/Potatoes).

Traditionally, *Borago officinalis* has been used in [hyperactive](/wiki/Hyperactive) [gastrointestinal](/wiki/Gastrointestinal), [respiratory](/wiki/Respiratory) and [cardiovascular](/wiki/Cardiovascular) disorders,[[13]](#cite_note-13) such as gastrointestinal ([colic](/wiki/Colic), [cramps](/wiki/Cramps), [diarrhea](/wiki/Diarrhea)), airways ([asthma](/wiki/Asthma), [bronchitis](/wiki/Bronchitis)), cardiovascular, ([cardiotonic](/wiki/Cardiotonic), [antihypertensive](/wiki/Antihypertensive) and blood purifier), [urinary](/wiki/Urinary) (diuretic and kidney/bladder disorders).[[14]](#cite_note-14) [Naturopathic](/wiki/Naturopathic) practitioners use borage for regulation of metabolism and the hormonal system, and consider it to be a good remedy for [PMS](/wiki/PMS) and [menopause](/wiki/Menopause) symptoms such as the [hot flash](/wiki/Hot_flash).[[15]](#cite_note-15)[Template:Dubious](/wiki/Template:Dubious) The flowers can be prepared in infusion.

One case of [status epilepticus](/wiki/Status_epilepticus) has been reported that was associated with borage oil ingestion.[[16]](#cite_note-16) A [methanol](/wiki/Methanol) extract of borage has shown strong [amoebicidal](/wiki/Amoebicidal) activity [*in vitro*](/wiki/In_vitro). The 50% inhibitory concentration ([Template:LD50](/wiki/Template:LD50)) of the extract against [*Entamoeba histolytica*](/wiki/Entamoeba_histolytica) was 33 µg/mL.[[17]](#cite_note-17)

## In history[[edit](/index.php?title=(none)&action=edit&section=5)]

[Pliny the Elder](/wiki/Pliny_the_Elder) and [Dioscorides](/wiki/Dioscorides) say that borage was the "Nepenthe" mentioned in [Homer](/wiki/Homer), which caused forgetfullness when mixed with wine.[[18]](#cite_note-18) [Francis Bacon](/wiki/Francis_Bacon) thought that borage had "an excellent spirit to repress the fuliginous vapour of dusky melancholie."[[18]](#cite_note-18)[John Gerard's](/wiki/John_Gerard) *Herball* mentions an old verse concerning the plant: "Ego Borago, Gaudia semper ago (I, Borage, bring always courage)". He states that "Those of our time do use the flowers in sallads to exhilerate and make the mind glad. There be also many things made of these used everywhere for the comfort of the heart, for the driving away of sorrow and increasing the joy of the minde. The leaves and floures of Borage put into wine make men and women glad and merry and drive away all sadnesse, dulnesse and melancholy, as Dios corides and Pliny affirme. Syrup made of the floures of Borage comforteth the heart, purgeth melancholy and quieteth the phrenticke and lunaticke person. The leaves eaten raw ingender good bloud, especially in those that have been lately sicke."[[18]](#cite_note-18)

## Companion planting[[edit](/index.php?title=(none)&action=edit&section=6)]

Borage is used in [companion planting](/wiki/Companion_plant).[[19]](#cite_note-19) It is said to protect or nurse [legumes](/wiki/Legumes), [spinach](/wiki/Spinach), [brassicas](/wiki/Brassicas), and even [strawberries](/wiki/Strawberries).[[20]](#cite_note-20) It is also said to be a good companion plant to [tomatoes](/wiki/Tomatoes) because it confuses the mother moths of [tomato hornworms](/wiki/Tomato_hornworm) or [manduca](/wiki/Manduca) looking for a place to lay their eggs.[[21]](#cite_note-21) Claims that it improves tomato growth[[22]](#cite_note-22) and makes them taste better[[23]](#cite_note-23) remain unsubstantiated.

## See also[[edit](/index.php?title=(none)&action=edit&section=7)]

* [List of companion plants](/wiki/List_of_companion_plants)

## References[[edit](/index.php?title=(none)&action=edit&section=8)]

[Template:Reflist](/wiki/Template:Reflist)

## External links[[edit](/index.php?title=(none)&action=edit&section=9)]

[Template:Commons](/wiki/Template:Commons)

* [Template:Cite AmCyc](/wiki/Template:Cite_AmCyc)
* [Template:Cite web](/wiki/Template:Cite_web)

[Template:Herbs & spices](/wiki/Template:Herbs_&_spices)

[Category:Boraginaceae](/wiki/Category:Boraginaceae) [Category:Herbs](/wiki/Category:Herbs) [Category:Leaf vegetables](/wiki/Category:Leaf_vegetables) [Category:Medicinal plants of Asia](/wiki/Category:Medicinal_plants_of_Asia) [Category:Flora of Europe](/wiki/Category:Flora_of_Europe) [Category:Flora of the Mediterranean](/wiki/Category:Flora_of_the_Mediterranean) [Category:Plants described in 1753](/wiki/Category:Plants_described_in_1753) [Category:Requests for audio pronunciation (English)](/wiki/Category:Requests_for_audio_pronunciation_(English))