



## About Herbs

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### Borage

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#### Consumer

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#### Scientific Name

*Borago officinalis*

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#### Common Name

Bee plant, bee bread, borage seed oil, ox's tongue, starflower oil

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#### Clinical Summary

Oil derived from the plant. Recent studies have shown gamma-linoleic acid (GLA) from borage seed oil has some benefits in treating rheumatoid arthritis<sup>(7)</sup> (9). Studies on borage oil's effect on skin conditions, such as atopic eczema<sup>(11)</sup> (12) and infantile seborrheic dermatitis<sup>(5)</sup>, yielded mixed results. Borage oil contains a pyrrolizidine alkaloid, amabiline, which is hepatotoxic. Risk of hepatic damage increases with length of exposure and cumulative dose consumed. Patients should use borage oil certified free of unsaturated pyrrolizidine alkaloids. Borage oil may be unsafe during pregnancy.

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#### Purported uses

- Arthritis
- Chest congestion
- Cough
- Depression
- Infantile seborrheic dermatitis
- Menopausal symptoms



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## Constituents

- **Alkaloids:** Contains small amounts of many pyrrolizidine types, especially amabiline (hepatotoxin).
- **Fatty acids:** Linoleic acid gamma-linolenic acid (GLA), oleic and saturated fatty acids
- **Mucilages:** Glucose, galactose and arabinose
- **Acids:** Acetic, lactic, malic and silicic
- **Tannins**
- **Saponins**

(1)



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## Mechanism of Action

The GLA from the borage seeds may have anti-inflammatory properties. GLA can be converted to the prostaglandin precursor dihomo-gamma-linolenic acid (DGLA). DGLA can block the transformation of arachidonic acid to leukotrienes and other prostaglandins (10). GLA can increase cAMP level which suppresses the synthesis of tumor necrosis factor-alpha - an inflammatory mediator linked to rheumatoid arthritis (9). The mucilage constituent has an expectorant-like action and malic acid has a mild diuretic effect. The tannin constituent may have mild astringent and constipating actions.

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## Warnings

Borage contains small amounts of the alkaloid amabiline, which is hepatotoxic. Consumption of 1-2 g of borage seed oil daily can result in an intake of toxic unsaturated pyrrolizidine alkaloids (UPAs) approaching 10 ug. The German Federal Health Agency now specifies consumption of such products should be limited to no more than 1 ug of UPA daily. Borage oil products should be certified free of UPAs (meet criterion of no more than 0.5-1 ug/g).

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## Contraindications

**Pregnancy:** Preliminary studies suggest borage oil has a teratogenic effect and that its prostaglandin E agonist action may cause premature labor.

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## Adverse Reactions

**Common:** Constipation may occur after administration.

**Rare:** Hepatotoxicity has been reported following chronic administration.



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## Herb-Drug Interactions

**Phenothiazines:** Theoretically borage oil may lower the seizure threshold due to its gamma linoleic acid content. Seizures have been documented with evening primrose oil, but not borage oil.

**Tricyclic antidepressants:** Theoretically, may lower seizure threshold due to gamma linoleic acid content. Seizures have been documented with evening primrose oil, but not borage oil.

**NSAIDs:** Theoretically concomitant use with borage oil would decrease the effects of borage oil, as NSAIDs interfere with the synthesis of prostaglandin E.

(6) (9)



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## Literature Summary and Critique

[Henz BM, et al. Double-blind, multicentre analysis of the efficacy of borage oil in patients with](#)

[atopic eczema. \*Br J Dermatol\* 1999;140:685-8.](#)

A double-blind, multicenter study of borage oil (23% GLA) in 167 adults with stable atopic eczema of moderate severity. Patients were randomized to take daily either 500 mg of borage oil-containing capsules or the bland lipid miglyol as a placebo over a 24-week period. Primary endpoint was amount of rescue medication (topical diflucortolone-21-valerate cream) used until response; secondary endpoint was clinical improvement. Patients taking borage oil experienced small but insignificant clinical improvements compared to placebo; a subgroup excluding noncompliant patients and those who failed to show increased erythrocyte dihomo-gamma-linolenic acid levels showed a significant benefit.

[Leventhal LJ, et al. Treatment of rheumatoid arthritis with gammalinoleic acid. \*Ann Intern Med\* 1993;119:867-73.](#)

A randomized, double-blind, placebo-controlled, 24-week trial of 37 patients with rheumatoid arthritis and active synovitis. The treatment group receiving gammalinoleic acid (GLA) 1.4 g experienced a 36% reduction in the number of tender joints and a 28% reduction in swollen joints. The placebo group did not show significant improvement in any measure. No significant adverse effects were reported.

[Pullman-Mooar S, et al. Alteration of the cellular fatty acid profile and the production of eicosanoids in human monocytes by gamma-linolenic acid. \*Arthritis Rheum\* 1990;33:1526-33.](#)

In an uncontrolled trial, borage seed oil 1.1 g was given to 7 healthy patients and seven patients with rheumatoid arthritis for 12 weeks. Eighty-five percent of the arthritic group experienced relief, possibly due to the GLA in the borage oil.



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