



Borage

Revised: December 3, 2018.

CASRN: 84012-16-8

Drug Levels and Effects

Summary of Use during Lactation

Borage (*Borago officinalis*) is available as plant parts such as the leaf and flower and borage seed oil. Borage plant parts contain pyrrolizidine alkaloids that are toxic to the liver and lungs and possibly carcinogenic. These alkaloids might be excreted into breastmilk.[1] Borage plant parts have been used as a mild diuretic, expectorant, to induce sweating, and in proprietary mixtures promoted to increase milk supply;[2][3] however, no scientifically valid clinical trials support this use. Galactagogues should never replace evaluation and counseling on modifiable factors that affect milk production.[4] Products containing other plant parts such as leaves should be avoided.[3]

Borage seed oil contains high concentrations of gamma-linolenic acid, an omega-6 fatty acid, and possibly small amounts of pyrrolizidine alkaloids. Supplementation of nursing mothers with borage seed oil increases the breastmilk content of gamma-linolenic acid and dihomo-gamma-linoleic acid, but not arachidonic acid. Borage seed oil is generally well tolerated in adults; however, only products certified as pyrrolizidine alkaloid free should be used. Heating breastmilk to 63.5 degrees C reduces the concentration of linolenic acid by about 22%. Freezing milk at -20 degrees C and thawing more than once decreases linolenic acid concentration by an average of 63%. [5]

Dietary supplements do not require extensive pre-marketing approval from the U.S. Food and Drug Administration. Manufacturers are responsible to ensure the safety, but do not need to *prove* the safety and effectiveness of dietary supplements before they are marketed. Dietary supplements may contain multiple ingredients, and differences are often found between labeled and actual ingredients or their amounts. A manufacturer may contract with an independent organization to verify the quality of a product or its ingredients, but that does *not* certify the safety or effectiveness of a product. Because of the above issues, clinical testing results on one product may not be applicable to other products. More detailed information [about dietary supplements](#) is available elsewhere on the LactMed Web site.

Drug Levels

Maternal Levels. Forty nursing mothers averaging 5 weeks postpartum were randomized to receive borage seed oil capsules containing either 230 or 460 mg of gamma-linolenic acid (GLA) daily in 4 divided doses for 1 week. Half of the women in each group were considered to be atopic and had lower initial levels of arachidonic acid (AA) and dihomo-gamma-linoleic acid (DGLA) in their breastmilk. In the low-dose group of atopic mothers, GLA levels increased from 0.11% by weight to 0.16%. In the high-dose group of atopic mothers, GLA levels increased from 0.09% to 0.18%. DGLA also increased from 0.41% to 0.53% in the low-dose group and from 0.36% to 0.51% in the high-dose group. AA levels were not affected by supplementation.[6]

Infant Levels. Relevant published information was not found as of the revision date.

Effects in Breastfed Infants

Relevant published information was not found as of the revision date.

Effects on Lactation and Breastmilk

Relevant published information was not found as of the revision date.

References

1. Panter KE, James LF. Natural plant toxicants in milk: a review. *J Anim Sci.* 1990;68:892-904. PubMed PMID: 2180885.
2. Howard CR, Lawrence RA. Drugs and breastfeeding. *Clin Perinatol.* 1999;26:447-78. PubMed PMID: 10394496.
3. Low Dog T. The use of botanicals during pregnancy and lactation. *Altern Ther Health Med.* 2009;15:54-8. PubMed PMID: 19161049.
4. Brodribb W. ABM Clinical Protocol #9: Use of galactogogues in initiating or augmenting maternal milk production, second revision 2018. *Breastfeed Med.* 2018;13:307-14. PubMed PMID: 29902083.
5. Wardell JM, Hill CM, D'Souza SW. Effect of pasteurization and of freezing and thawing human milk on its triglyceride content. *Acta Paediatr Scand.* 1981;70:467-71. PubMed PMID: 7315290.
6. Thijs C, Houwelingen A, Poorterman I et al. Essential fatty acids in breast milk of atopic mothers: comparison with non-atopic mothers, and effect of borage oil supplementation. *Eur J Clin Nutr.* 2000;54:234-8. PubMed PMID: 10713746.

Substance Identification

Substance Name

Borage

Scientific Name

Borago officinalis

CAS Registry Number

84012-16-8

Drug Class

Breast Feeding

Lactation

Complementary Therapies

Galactogogues

Phytotherapy

Plants, Medicinal