Blueberry

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Blueberry  
What is it?  
Blueberries are edible fruits from the Vaccinium angustifolium plant. Blueberry is a common food and is also sometimes used as medicine.  
  
Blueberries are high in fiber, which can help with normal digestion. They also contain vitamin C, other antioxidants, and chemicals that might reduce swelling and destroy cancer cells.  
  
People use blueberry for aging, memory and thinking skills, high blood pressure, athletic performance, diabetes, and many other conditions, but there is no good scientific evidence to support these uses.  
  
Don't confuse blueberry with bilberry. They are related but they are not the same. In countries outside of the US, the name blueberry is used to refer to the plant that is often called bilberry in the US.  
  
  
  
How effective is it?  
Natural Medicines Comprehensive Database rates effectiveness based on scientific evidence according to the following scale: Effective, Likely Effective, Possibly Effective, Possibly Ineffective, Likely Ineffective, Ineffective, and Insufficient Evidence to Rate.The effectiveness ratings for BLUEBERRY are as follows:Possibly ineffective for...  
High blood pressure. Eating freeze-dried blueberries or taking blueberry powder by mouth doesn't lower blood pressure in people with high blood pressure or other heart disease risk factors.   
  
  
There is interest in using blueberry for a number of other purposes, but there isn't enough reliable information to say whether it might be helpful.  
  
  
Is it safe?  
When taken by mouth: Blueberry whole fruit, juice, and powders are commonly consumed in foods. Drinks made with freeze-dried blueberries might cause constipation, diarrhea, nausea, or vomiting in some people.   
  
There isn't enough reliable information to know if taking blueberry leaf is safe or what the side effects might be.  
When applied to the skin: There isn't enough reliable information to know if blueberry is safe or what the side effects might be.  
Special precautions & warnings:  
Pregnancy and breast-feeding: Blueberry fruit is commonly consumed in foods. But there isn't enough reliable information to know if blueberry is safe to use in larger amounts as medicine when pregnant or breast-feeding. Stay on the safe side and stick to food amounts.  
Glucose-6-phosphate dehydrogenase (G6PD) deficiency: G6PD is a genetic disorder. People with this disorder have problems breaking down some chemicals in food and drugs. One or more of these chemicals are found in blueberries. If you have G6PD, check with your healthcare provider before eating blueberries.   
Surgery: Blueberry fruit and leaf might affect blood glucose levels and could interfere with blood sugar control during and after surgery.   
  
  
Are there interactions with medications?  
MinorBe watchful with this combination.Buspirone (BuSpar)Blueberry juice might decrease how fast the body gets rid of buspirone. But this is not likely to be a major concern.Flurbiprofen (Ansaid, others)Blueberry juice might decrease how fast the body gets rid of flurbiprofen. But this is not likely to be a major concern.Medications for diabetes (Antidiabetes drugs)Blueberry fruit or leaf might lower blood sugar levels. Taking blueberry along with diabetes medications might cause blood sugar to drop too low. Monitor your blood sugar closely.  
  
  
Are there interactions with herbs and supplements?  
Herbs and supplements that might lower blood sugarBlueberry fruit or leaf might lower blood sugar. Taking it with other supplements with similar effects might lower blood sugar too much. Examples of supplements with this effect include aloe, bitter melon, cassia cinnamon, chromium, and prickly pear cactus.  
  
  
Are there interactions with foods?  
Drinking milk along with blueberries might lower the potential health benefits of blueberries. Consuming blueberries 1-2 hours before or after drinking milk might prevent this interaction.  
  
  
How is it typically used?  
Blueberries are commonly consumed in foods. As medicine, freeze-dried blueberries have most often been used by adults in doses of 22-50 grams by mouth daily for up to 16 weeks. Blueberry extracts and blueberry leaf extracts have also been used. Speak with a healthcare provider to find out what type of product and dose might be best for a specific condition.  
  
  
Other names  
Ar ndano, Bleuet, Bleuet des Champs, Bleuet des Montagnes, Bleuets, Blueberries, Highbush Blueberry, Hillside Blueberry, Lowbush Blueberry, Myrtille, Rabbiteye Blueberry, Rubel, Tifblue, Vaccinium altomontanum, Vaccinium amoenum, Vaccinium angustifolium, Vaccinium ashei, Vaccinium brittonii, Vaccinium constablaei, Vaccinium corymbosum, Vaccinium lamarckii, Vaccinium pallidum, Vaccinium pensylvanicum, Vaccinium vacillans, Vaccinium virgatum.  
  
  
Methodology  
  
 To learn more about how this article was written, please see the Natural Medicines Comprehensive Database methodology.   
   
  
  
References  
Sinclair J, Bottoms L, Dillon S, Allan R, Shadwell G, Butters B. Effects of Montmorency Tart Cherry and Blueberry Juice on Cardiometabolic and Other Health-Related Outcomes: A Three-Arm Placebo Randomized Controlled Trial. Int J Environ Res Public Health 2022;19:5317. View abstract.  
Krikorian R, Skelton MR, Summer SS, Shidler MD, Sullivan PG. Blueberry Supplementation in Midlife for Dementia Risk Reduction. Nutrients 2022;14:1619. View abstract.  
Habanova M, Holovicova M, Scepankova H, et al. Modulation of Lipid Profile and Lipoprotein Subfractions in Overweight/Obese Women at Risk of Cardiovascular Diseases through the Consumption of Apple/Berry Juice. Antioxidants 2022;11:2239.   
Anders JPV, Neltner TJ, Smith RW, et al. The effects of phosphocreatine disodium salts plus blueberry extract supplementation on muscular strength, power, and endurance. J Int Soc Sports Nutr 2021;18:60. View abstract.  
Palma X, Thomas-Vald s S, Cruz G. Acute consumption of blueberries and short-term blueberry supplementation improve glucose management and insulin levels in sedentary subjects. Nutrients 2021;13:1458. View abstract.  
Brandenburg JP, Giles LV. Blueberry supplementation reduces the blood lactate response to running in normobaric hypoxia but has no effect on performance in recreational runners. J Int Soc Sports Nutr 2021;18:26. View abstract.  
Basu A, Feng D, Planinic P, Ebersole JL, Lyons TJ, Alexander JM. Dietary blueberry and soluble fiber supplementation reduces risk of gestational diabetes in women with obesity in a randomized controlled trial. J Nutr 2021;151:1128-38. View abstract.  
Carvalho MF, Lucca ABA, Ribeiro E Silva VR, Macedo LR, Silva M. Blueberry intervention improves metabolic syndrome risk factors: systematic review and meta-analysis. Nutr Res 2021;91:67-80. View abstract.  
Stull AJ, Cash KC, Champagne CM, et al. Blueberries improve endothelial function, but not blood pressure, in adults with metabolic syndrome: a randomized, double-blind, placebo-controlled clinical trial. Nutrients. 2015;7:4107-23. View abstract.  
Basu A, Du M, Leyva MJ, et al. Blueberries decrease cardiovascular risk factors in obese men and women with metabolic syndrome. J Nutr 2010;140:1582-7. View abstract.  
Fisk J, Khalid S, Reynolds SA, Williams CM. Effect of 4 weeks daily wild blueberry supplementation on symptoms of depression in adolescents. Br J Nutr 2020:1-8. View abstract.  
Miraghajani M, Momenyan S, Arab A, Hasanpour Dehkordi A, Symonds ME. Blueberry and cardiovascular disease risk factors: a systematic review and meta-analysis of randomized controlled trials. Complement Ther Med 2020;53:102389. View abstract.  
Stote KS, Wilson MM, Hallenbeck D, et al. Effect of blueberry consumption on cardiometabolic health parameters in men with type 2 diabetes: an 8-week, double-blind, randomized, placebo-controlled trial. Curr Dev Nutr 2020;4:nzaa030. View abstract.  
Babu T, Panachiyil GM, Sebastian J, Ravi MD. Probable blueberry-induced haemolysis in a G6PD deficient child: A case report. Nutr Health. 2019;25:303-305. View abstract.  
Brandenburg JP, Giles LV. Four days of blueberry powder supplementation lowers the blood lactate response to running but has no effect on time-trial performance. Int J Sport Nutr Exerc Metab. 2019:1-7. View abstract.  
Rutledge GA, Fisher DR, Miller MG, Kelly ME, Bielinski DF, Shukitt-Hale B. The effects of blueberry and strawberry serum metabolites on age-related oxidative and inflammatory signaling in vitro. Food Funct. 2019;10:7707-7713. View abstract.  
Barfoot KL, May G, Lamport DJ, Ricketts J, Riddell PM, Williams CM. The effects of acute wild blueberry supplementation on the cognition of 7-10-year-old schoolchildren. Eur J Nutr. 2019;58:2911-2920. View abstract.  
Philip P, Sagaspe P, Taillard J, et al. Acute intake of a grape and blueberry polyphenol-rich extract ameliorates cognitive performance in healthy young adults during a sustained cognitive effort. Antioxidants (Basel). 2019;8. pii: E650. View abstract.  
Shoji K, Yamasaki M, Kunitake H. Effects of dietary blueberry (Vaccinium ashei Reade) leaves on mildly postprandial hypertriglyceridemia. J Oleo Sci. 2020;69:143-151. View abstract.  
Curtis PJ, van der Velpen V, Berends L, et al. Blueberries improve biomarkers of cardiometabolic function in participants with metabolic syndrome-results from a 6-month, double-blind, randomized controlled trial. Am J Clin Nutr. 2019;109:1535-1545. View abstract.  
Boespflug EL, Eliassen JC, Dudley JA, et al. Enhanced neural activation with blueberry supplementation in mild cognitive impairment. Nutr Neurosci. 2018;21:297-305. View abstract.  
Whyte AR, Cheng N, Fromentin E, Williams CM. A randomized, double-blinded, placebo-controlled study to compare the safety and efficacy of low dose enhanced wild blueberry powder and wild blueberry extract (ThinkBlue) in maintenance of episodic and working memory in older adults. Nutrients. 2018;10. pii: E660. View abstract.  
McNamara RK, Kalt W, Shidler MD, et al. Cognitive response to fish oil, blueberry, and combined supplementation in older adults with subjective cognitive impairment. Neurobiol Aging. 2018;64:147-156. View abstract.  
Miller MG, Hamilton DA, Joseph JA, Shukitt-Hale B. Dietary blueberry improves cognition among older adults in a randomized, double-blind, placebo-controlled trial. Eur J Nutr 2018;57:1169-80. View abstract.  
Zhong S, Sandhu A, Edirisinghe I, Burton-Freeman B. Characterization of wild blueberry polyphenols bioavailability and kinetic profile in plasma over 24-h period in human subjects. Mol Nutr Food Res 2017;61. View abstract.  
Whyte AR, Schafer G, Williams CM. Cognitive effects following acute wild blueberry supplementation in 7- to 10-year-old children. Eur J Nutr 2016;55:2151-62. View abstract.  
Xu N, Meng H, Liu T, Feng Y, Qi Y, Zhang D, Wang H. Blueberry phenolics reduce gastrointestinal infection in patients with cerebral venous thrombosis by improving depressant-induced autoimmune disorder via miR-155-mediated brain-derived neurotrophic factor. Front Pharmacol 2017;8:853. View abstract.  
Whyte AR, Williams CM. Effects of a single dose of a flavonoid-rich blueberry drink on memory in 8 to 10 y old children. Nutrition. 2015 Mar;31:531-4. View abstract.  
Rodriguez-Mateos A, Rendeiro C, Bergillos-Meca T, Tabatabaee S, George TW, Heiss C, Spencer JP. Intake and time dependence of blueberry flavonoid-induced improvements in vascular function: a randomized, controlled, double-blind, crossover intervention study with mechanistic insights into biological activity. Am J Clin Nutr. 2013 Nov;98:1179-91. View abstract.  
Rodriguez-Mateos A, Del Pino-Garc a R, George TW, Vidal-Diez A, Heiss C, Spencer JP. Impact of processing on the bioavailability and vascular effects of blueberry (poly)phenols. Mol Nutr Food Res. 2014 Oct;58:1952-61. View abstract.  
Kalt W, Liu Y, McDonald JE, Vinqvist-Tymchuk MR, Fillmore SA. Anthocyanin metabolites are abundant and persistent in human urine. J Agric Food Chem. 2014 May 7;62:3926-34. View abstract.  
Zhu Y, Sun J, Lu W, Wang X, Wang X, Han Z, Qiu C. Effects of blueberry supplementation on blood pressure: a systematic review and meta-analysis of randomized clinical trials. J Hum Hypertens. 2016 Sep 22. View abstract.  
Lobos GA, Hancock JF. Breeding blueberries for a changing global environment: a review. Front Plant Sci. 2015 Sep 30;6:782. View abstract.  
Zhong Y, Wang Y, Guo J, Chu H, Gao Y, Pang L. Blueberry Improves the Therapeutic Effect of Etanercept on Patients with Juvenile Idiopathic Arthritis: Phase III Study. Tohoku J Exp Med. 2015;237:183-91. View abstract.  
Schrager MA, Hilton J, Gould R, Kelly VE. Effects of blueberry supplementation on measures of functional mobility in older adults. Appl Physiol Nutr Metab. 2015 Jun;40:543-9. View abstract.  
Johnson SA, Figueroa A, Navaei N, Wong A, Kalfon R, Ormsbee LT, Feresin RG, Elam ML, Hooshmand S, Payton ME, Arjmandi BH. Daily blueberry consumption improves blood pressure and arterial stiffness in postmenopausal women with pre- and stage 1-hypertension: a randomized, double-blind, placebo-controlled clinical trial. J Acad Nutr Diet. 2015 Mar;115:369-77. View abstract.  
Hanley MJ, Masse G, Harmatz JS, Cancalon PF, Dolnikowski GG, Court MH, Greenblatt DJ. Effect of blueberry juice on clearance of buspirone and flurbiprofen in human volunteers. Br J Clin Pharmacol. 2013 Apr;75:1041-52. View abstract.  
 McIntyre, K. L., Harris, C. S., Saleem, A., Beaulieu, L. P., Ta, C. A., Haddad, P. S., and Arnason, J. T. Seasonal phytochemical variation of anti-glycation principles in lowbush blueberry (Vaccinium angustifolium). Planta Med 2009;75:286-292. View abstract.  
 Nemes-Nagy, E., Szocs-Molnar, T., Dunca, I., Balogh-Samarghitan, V., Hobai, S., Morar, R., Pusta, D. L., and Craciun, E. C. Effect of a dietary supplement containing blueberry and sea buckthorn concentrate on antioxidant capacity in type 1 diabetic children. Acta Physiol Hung. 2008;95:383-393. View abstract.  
 Shukitt-Hale, B., Lau, F. C., Carey, A. N., Galli, R. L., Spangler, E. L., Ingram, D. K., and Joseph, J. A. Blueberry polyphenols attenuate kainic acid-induced decrements in cognition and alter inflammatory gene expression in rat hippocampus. Nutr Neurosci. 2008;11:172-182. View abstract.  
 Kalt, W., Blumberg, J. B., McDonald, J. E., Vinqvist-Tymchuk, M. R., Fillmore, S. A., Graf, B. A., O'Leary, J. M., and Milbury, P. E. Identification of anthocyanins in the liver, eye, and brain of blueberry-fed pigs. J Agric.Food Chem 2-13-2008;56:705-712. View abstract.  
 Vuong, T., Martineau, L. C., Ramassamy, C., Matar, C., and Haddad, P. S. Fermented Canadian lowbush blueberry juice stimulates glucose uptake and AMP-activated protein kinase in insulin-sensitive cultured muscle cells and adipocytes. Can J Physiol Pharmacol 2007;85:956-965. View abstract.  
 Kornman, K., Rogus, J., Roh-Schmidt, H., Krempin, D., Davies, A. J., Grann, K., and Randolph, R. K. Interleukin-1 genotype-selective inhibition of inflammatory mediators by a botanical: a nutrigenetics proof of concept. Nutrition 2007;23(11-12):844-852. View abstract.  
 Pan, M. H., Chang, Y. H., Badmaev, V., Nagabhushanam, K., and Ho, C. T. Pterostilbene induces apoptosis and cell cycle arrest in human gastric carcinoma cells. J Agric.Food Chem 9-19-2007;55:7777-7785. View abstract.  
 Wilms, L. C., Boots, A. W., de Boer, V. C., Maas, L. M., Pachen, D. M., Gottschalk, R. W., Ketelslegers, H. B., Godschalk, R. W., Haenen, G. R., van Schooten, F. J., and Kleinjans, J. C. Impact of multiple genetic polymorphisms on effects of a 4-week blueberry juice intervention on ex vivo induced lymphocytic DNA damage in human volunteers. Carcinogenesis 2007;28:1800-1806. View abstract.  
 Prior, R. L., Gu, L., Wu, X., Jacob, R. A., Sotoudeh, G., Kader, A. A., and Cook, R. A. Plasma antioxidant capacity changes following a meal as a measure of the ability of a food to alter in vivo antioxidant status. J Am Coll Nutr 2007;26:170-181. View abstract.  
 Neto, C. C. Cranberry and blueberry: evidence for protective effects against cancer and vascular diseases. Mol.Nutr Food Res 2007;51:652-664. View abstract.  
 Torri, E., Lemos, M., Caliari, V., Kassuya, C. A., Bastos, J. K., and Andrade, S. F. Anti-inflammatory and antinociceptive properties of blueberry extract (Vaccinium corymbosum). J Pharm Pharmacol 2007;59:591-596. View abstract.  
 Srivastava, A., Akoh, C. C., Fischer, J., and Krewer, G. Effect of anthocyanin fractions from selected cultivars of Georgia-grown blueberries on apoptosis and phase II enzymes. J Agric.Food Chem 4-18-2007;55:3180-3185. View abstract.  
 Abidov, M., Ramazanov, A., Jimenez Del, Rio M., and Chkhikvishvili, I. Effect of Blueberin on fasting glucose, C-reactive protein and plasma aminotransferases, in female volunteers with diabetes type 2: double-blind, placebo controlled clinical study. Georgian.Med News 2006;:66-72. View abstract.  
 Tonstad, S., Klemsdal, T. O., Landaas, S., and Hoieggen, A. No effect of increased water intake on blood viscosity and cardiovascular risk factors. Br J Nutr 2006;96:993-996. View abstract.  
 Seeram, N. P., Adams, L. S., Zhang, Y., Lee, R., Sand, D., Scheuller, H. S., and Heber, D. Blackberry, black raspberry, blueberry, cranberry, red raspberry, and strawberry extracts inhibit growth and stimulate apoptosis of human cancer cells in vitro. J Agric.Food Chem 12-13-2006;54:9329-9339. View abstract.  
 Martineau, L. C., Couture, A., Spoor, D., Benhaddou-Andaloussi, A., Harris, C., Meddah, B., Leduc, C., Burt, A., Vuong, T., Mai, Le P., Prentki, M., Bennett, S. A., Arnason, J. T., and Haddad, P. S. Anti-diabetic properties of the Canadian lowbush blueberry Vaccinium angustifolium Ait. Phytomedicine. 2006;13(9-10):612-623. View abstract.  
 Matchett, M. D., MacKinnon, S. L., Sweeney, M. I., Gottschall-Pass, K. T., and Hurta, R. A. Inhibition of matrix metalloproteinase activity in DU145 human prostate cancer cells by flavonoids from lowbush blueberry (Vaccinium angustifolium): possible roles for protein kinase C and mitogen-activated protein-kinase-mediated events. J Nutr Biochem 2006;17:117-125. View abstract.  
 McDougall, G. J., Shpiro, F., Dobson, P., Smith, P., Blake, A., and Stewart, D. Different polyphenolic components of soft fruits inhibit alpha-amylase and alpha-glucosidase. J Agric.Food Chem 4-6-2005;53:2760-2766. View abstract.  
 Parry, J., Su, L., Luther, M., Zhou, K., Yurawecz, M. P., Whittaker, P., and Yu, L. Fatty acid composition and antioxidant properties of cold-pressed marionberry, boysenberry, red raspberry, and blueberry seed oils. J Agric.Food Chem 2-9-2005;53:566-573. View abstract.  
 Casadesus, G., Shukitt-Hale, B., Stellwagen, H. M., Zhu, X., Lee, H. G., Smith, M. A., and Joseph, J. A. Modulation of hippocampal plasticity and cognitive behavior by short-term blueberry supplementation in aged rats. Nutr Neurosci. 2004;7(5-6):309-316. View abstract.  
 Goyarzu, P., Malin, D. H., Lau, F. C., Taglialatela, G., Moon, W. D., Jennings, R., Moy, E., Moy, D., Lippold, S., Shukitt-Hale, B., and Joseph, J. A. Blueberry supplemented diet: effects on object recognition memory and nuclear factor-kappa B levels in aged rats. Nutr Neurosci. 2004;7:75-83. View abstract.  
 Joseph, J. A., Denisova, N. A., Arendash, G., Gordon, M., Diamond, D., Shukitt-Hale, B., and Morgan, D. Blueberry supplementation enhances signaling and prevents behavioral deficits in an Alzheimer disease model. Nutr Neurosci. 2003;6:153-162. View abstract.  
 Sweeney, M. I., Kalt, W., MacKinnon, S. L., Ashby, J., and Gottschall-Pass, K. T. Feeding rats diets enriched in lowbush blueberries for six weeks decreases ischemia-induced brain damage. Nutr Neurosci. 2002;5:427-431. View abstract.  
 Kay, C. D. and Holub, B. J. The effect of wild blueberry (Vaccinium angustifolium) consumption on postprandial serum antioxidant status in human subjects. Br.J.Nutr. 2002;88:389-398. View abstract.  
Spencer CM, Cai Y, Martin R, et al. Polyphenol complexation - some thoughts and observations. Phytochemistry 1988;27:2397-2409.  
Serafini M, Testa MF, Villano D, et al. Antioxidant activity of blueberry fruit is impaired by association with milk. Free Radic Bio Med 2009;46:769-74. View abstract.  
Lyons MM, Yu C, Toma RB, et al. Resveratrol in raw and baked blueberries and bilberries. J Agric Food Chem 2003;51:5867-70. View abstract.  
Wang SY, Lin HS. Antioxidant activity in fruits and leaves of blackberry, raspberry, and strawberry varies with cultivar and developmental stage. J Agric Food Chem 2000;48:140-6.. View abstract.  
Wang SY, Jiao H. Scavenging capacity of berry crops on superoxide radicals, hydrogen peroxide, hydroxyl radicals, and singlet oxygen. J Agric Food Chem 2000;48:5677-84.. View abstract.  
Wu X, Cao G, Prior RL. Absorption and metabolism of anthocyanins in elderly women after consumption of elderberry or blueberry. J Nutr 2002;132:1865-71. View abstract.  
Joseph JA, Denisova N, Fisher D, et al. Membrane and receptor modifications of oxidative stress vulnerability in aging. Nutritional considerations. Ann N Y Acad Sci 1998;854:268-76.. View abstract.  
Hiraishi K, Narabayashi I, Fujita O, et al. Blueberry juice: preliminary evaluation as an oral contrast agent in gastrointestinal MR imaging. Radiology 1995;194:119-23.. View abstract.  
Ofek I, Goldhar J, Zafriri D, et al. Anti-Escherichia coli adhesin activity of cranberry and blueberry juices. N Engl J Med 1991;324:1599. View abstract.  
Pedersen CB, Kyle J, Jenkinson AM, et al. Effects of blueberry and cranberry juice consumption on the plasma antioxidant capacity of healthy female volunteers. Eur J Clin Nutr 2000;54:405-8. View abstract.  
Howell AB, Vorsa N, Foo LY, et al. Inhibition of the Adherence of P-Fimbriated Escherichia coli to Uroepithelial-Cell Surfaces by Proanthocyanidin Extracts from Cranberries (letter). N Engl J Med 1998;339:1085-6. View abstract.  
Joseph JA, Shukitt-Hale B, Denisova NA, et al. Reversals of age-related declines in neuronal signal transduction, cognitive, and motor behavioral deficits with blueberry, spinach, or strawberry dietary supplementation. J Neurosci 1999;19:8114-21. View abstract.  
Cignarella A, Nastasi M, Cavalli E, Puglisi L. Novel lipid-lowering properties of Vaccinium myrtillus L. leaves, a traditional antidiabetic treatment, in several models of rat dyslipidaemia: a comparison with ciprofibrate. Thromb Res 1996;84:311-22. View abstract.  
Bickford PC, Gould T, Briederick L, et al. Antioxidant-rich diets improve cerebellar physiology and motor learning in aged rats. Brain Res 2000;866:211-7. View abstract.  
Cao G, Shukitt-Hale B, Bickford PC, et al. Hyperoxia-induced changes in antioxidant capacity and the effect of dietary antioxidants. J Appl Physiol 1999;86:1817-22. View abstract.  
Youdim KA, Shukitt-Hale B, MacKinnon S, et al. Polyphenolics enhance red blood cell resistance to oxidative stress: in vitro and in vivo . Biochim Biophys Acta 2000;1519:117-22. View abstract.  
Bomser J, Madhavi DL, Singletary K, Smith MA. In vitro anticancer activity of fruit extracts from Vaccinium species. Planta Med 1996;62:212-6.. View abstract.