

Studies on Blackcurrants and Vision Health

Title: Agent for Amelioration of Impaired Ophthalmic Arterial Blood Flow

Author: Hiroshi Oguro and Hitoshi Matsumoto

Study: Impaired ophthalmic blood flow, especially blood flow in discus nervi optici, causes a lot of diseases including glaucoma. The purpose of this study was to determine the ET-1 level after Cassis Anthocyanin consumption. ET-1 causes constriction of blood vessels and blood flow in discus nervi optici.

Results: Both ET-1 and blood flow in the discus nervi optici were normalized after the consumption of the Cassis Anthocyanin soft capsules.

Conclusion: These results conclude that Cassis Anthocyanins may have the capabilities to prevent and treat diseases and/or disorders associated with an impaired ophthalmic arterial blood flow.

Title: Anthocyanins from Bilberry and Blackcurrant Dampen Inflammation

Study: The researchers studied whether anthocyanins inhibit LPS-induced transcription factor nuclear factor (NF- κ B) activation in cultured monocytes. In a parallel-designed, placebo controlled clinical study, 120 participants were randomly assigned to receive 300 mg of anthocyanins or placebo for 3 weeks.

Results: The cultured cells incubated with anthocyanins, NF- κ B activation was suppressed by 18% compared with cells incubated with vehicle only. Anthocyanins also decreased the LPS-induced p65 DNA bind, another assay for NF- κ B activation, by 18%.

Conclusion: Because the NF- κ B controls expressions of the genes involved in the inflammatory responses and is activated by oxidative stress and other pro-inflammatory stimuli, the suppression of NF- κ B could combat chronic inflammation, which is believed to contribute to such eye diseases as ADM, dry eye, diabetic etinophy and glaucoma.

Title: Effects of Black Currant Anthocyanoside Intake on Dark Adaptation and VDT Work-Induced Transient Refractive Alteration in Healthy Humans

Authors: Hitoshi Nakaishi, Hitoshi Matsumoto, Shigeru Tominaga, and Masao Hirayama

Study: The effects of oral intake of blackcurrant Anthocyanoside concentrate on dark adaptation, video display terminal, work-induced transient refractive alteration, and subjective asthenopia symptoms (visual fatigue) were examined in a double-blind, placebo-controlled, crossover study with healthy human subjects.

Results: In the dark adaptation study, intakes of blackcurrant Anthocyanosides appeared to bring about dose-dependent lowering of the dark adaptation threshold. Comparing the refraction values for the dominant eye, blackcurrant Anthocyanoside intake resulted in no decrease in the average value after the visual task, whereas the placebo trial resulted in a large decrease in average value. Blackcurrant anthocyanoside intake also improved in eye and lower back symptoms.

Conclusion: oral intake of blackcurrant Anthocyanosides brought about the reduction of the dark adaptation threshold and promoted recovery from or served to prevent video terminal and work-induced transient refractive alteration and subjective symptoms of visual fatigue in healthy subjects.

Title: Delphinidin-3-rutinoside relaxes the bovine ciliary smooth muscle through activation of ETB receptor and NO/cGMP pathway

Authors: Hitoshi Matsumoto, Kristine E. Kamm, James T. Stull, and Hiroshi Azuma

Study: Myopia may be due to axial elongation of the globe, inappropriate refractive power of the eye, or a combination of both. This study tested Delphinidin-3-rutinoside (D3R), a major anthocyanin component in blackcurrant (*Ribes nigrum* L.) on the relaxation in bovine ciliary smooth muscle.

Results: After the pre-treatment with D3R, the anthocyanin exerted an inhibitory effect on the ET-1-induced contraction with a concomitant increase in cyclic GMP production and decreased phosphorylation ratio of myosin light chain. These results suggest that D3R possibly stimulates ETB receptors to produce/release NO (nitric oxide), and results in an inhibition of myosin RLC phosphorylation and/or acceleration of dephosphorylation, thereby causing relaxation and producing an inhibitory effect on the ET-1 induced contraction in the bovine ciliary muscle.

Conclusion: This is the first report demonstrating that D3R as a food component exerted the sustained and progressive relaxation during the contraction. In the myopic eye, contracted ciliary muscle cannot relax sufficiently to allow proper focusing on distant images, and the results suggest a beneficial effect of anthocyanins in improving myopia.

Title: Effects of Blackcurrant Anthocyanosides on Visual Function

Study: Blackcurrant Anthocyanosides powders and juice were constructed and given to healthy men and women volunteers. The purpose of this study was to evaluate the threshold of light sensing after 30 minutes of dark adaptation.

Result: In a study with healthy human volunteers, using the Goldmann/Weekers adaptometer, intake of 40 mg of blackcurrant Anthocyanosides diminished the threshold of light sensing after 30 minutes of scotopic vision as measured 2 hours after intake.

Conclusion: 40mg of blackcurrant Anthocyanosides diminished the threshold of light sensing after 30 minutes of scotopic vision. These findings indicate that blackcurrant Anthocyanosides promote dark adaptation, while promoting more rapid regeneration of the rod visual pigment rhodopsin.