

## **Blackcurrants – Anti-viral, Anti-inflammatory, Immunity Review of recent literature.**

### ***Anti-Viral properties***

Knox, M.Y., Suzutani, T., Yosida, I., Azuma, M. Anti-influenza virus activity of crude extract of *Ribes nigrum* L. *PHYTOTHERAPY RESEARCH* 2003, 17: 120-122.

Noguchi, A., Takeda, T., Watanabe, T., Yasui, H. Inhibitory effect of Cassis extract against influenza virus infection. *JOURNAL OF THE FACULTY OF AGRICULTURE, SHINSHU UNIVERSITY* 2008, 44 No. 1.2.

Key messages: These studies showed blackcurrant extract to possess antiviral activity. In one in vitro experiment it was found that cells infected by influenza virus type A (IVA) or influenza virus type B (IVB) had their rate of infection almost stopped when blackcurrant extract was applied. In another experiment, addition of virus and extract simultaneously to cells resulted in infection rates 2 - 5% of that observed when only virus was added. Mice fed extract exhibited reduced virus accumulation and improved mortality. Fractionation of extract demonstrated antiviral activity is possessed by the polyphenol containing fraction. Polyphenols act on haemagglutinin, inhibiting a virus's ability to enter infect a cell and reproduce within it. (Haemagglutinin is the molecule on the surface of viral particles that binds the virus to cells it is infecting.)

Ikuta, Kazufumi, et al. "Anti-viral and anti-bacterial activities of an extract of blackcurrants (*Ribes nigrum* L.)." *Microbiology and immunology* 56.12 (2012): 805-809.

Kazufumi Ikuta, Katsumi Mizuta and Tatsuo Suzutani. Anti-Influenza virus activity of two extracts of the blackcurrant (*Ribes Nigrum* L.) from New Zealand and Poland. *Fukushima Journal of Medical Science* 2013, Vol. 59, No.1: 35-38

Key messages: The authors demonstrated in a 2012 study Blackcurrants inhibit both viral adsorption onto cell surfaces and viral growth in cells. The antiviral effects of blackcurrants were observed across a wide spectrum of viruses, from RNA viruses (IFV and RSV) to DNA viruses (AdV and HSV). The follow-up 2013 study investigated the inhibitory effect of extracts of blackcurrant on four strains of influenza virus (IFV) by the inhibition of virus adhesion to the surface of the cells.

The inhibitory effect of the extracts of blackcurrant or blueberry (the control) on the infectivity of the virus, were evaluated by the inhibition of virus adhesion on the cell surface.

The study showed that although the antiviral effect of blackcurrant was slightly different within viral strains from one species, the extract of blackcurrant could disinfect all of four influenza strains that were examined.

Nikolaeva-Glomb, Lubomira, et al. "In vitro antiviral activity of a series of wild berry fruit extracts against representatives of Picorna-, Orthomyxo-and Paramyxoviridae." *Natural product communications* 9.1 (2014): 1934578X1400900116.

Key message: The results reveal that the total extracts of all tested berry fruits inhibit the replication of CV-B1 and influenza A virus

Humpherys, Brayden, and David D. Busath. "Anti-Influenza Nutraceuticals: Antiviral and Anti-Inflammatory Effects." (2019).

Key message: Blackcurrant can produce anti-inflammatory effects due to Cyanidin-3-O-glucoside, and anti influenza properties when prepared as the extract.

Pour, Pardis Mohammadi, et al. "The signalling pathways, and therapeutic targets of antiviral agents: Focusing on the antiviral approaches and clinical perspectives of anthocyanins in the management of viral diseases." *Frontiers in Pharmacology* 10 (2019).

Key message: The potential of anthocyanin to show its antiviral effects through binding to host cells, inhibiting viral life cycle, or stimulating host immunity, strengthens the idea that anthocyanin would be an essential brick and a potential therapeutic agent to find novel antiviral lead-compounds.

Altogether, the blackcurrant extracts displayed auspicious anti-InfV effects through different mechanisms.

Teaupa, Siale. "Nutraceuticals: An Alternative Treatment for Influenza Virus." (2018).

Key message: We have tested Jamaican Sorrel, Black Currant Berries, and Manuka Honey paired with Bee Pollen for antiviral activity. We have demonstrated that these nutraceuticals block the 2009 Pandemic California Influenza strain between a concentration range of 1:8-1:16 dilution.

## ***Anti-inflammatory Properties***

Shaw, O. M., Nyanhanda, T., McGhie, T. K., Harper, J. L., & Hurst, R. D. (2017). Blackcurrant anthocyanins modulate CCL11 secretion and suppress allergic airway inflammation. *Molecular nutrition & food research*, 61(9), 1600868.

Key message: oral supplementation with New Zealand blackcurrant is effective in reducing lung inflammation,

Tabart, Jessica, et al. "Antioxidant and anti-inflammatory activities of Ribes nigrum extracts." *Food Chemistry* 131.4 (2012): 1116-1122.

Key message: Blackcurrant berries contain high amounts of flavonoids with various health benefits as anti-inflammatory properties attributed to their antioxidant potential.

Lyall, K. A., Hurst, S. M., Cooney, J., Jensen, D., Lo, K., Hurst, R. D., & Stevenson, L. M. (2009). Short-term blackcurrant extract consumption modulates exercise-induced oxidative stress and lipopolysaccharide-stimulated inflammatory responses. *American Journal of Physiology-Regulatory, Integrative and Comparative Physiology*, 297(1), R70-R81.

Key message: BC extract used in this study demonstrated both antioxidant and anti-inflammatory properties,

## ***Immunity***

Amini, Anna Maria. *Effects of anthocyanins on the immune and cardiovascular system*. Diss. University of Reading, 2017.

Key message: Anthocyanins are increasingly being recognized for their potential health benefits, including effects on the immune and cardiovascular system.

Schoen, Christiane, et al. "Regulatory effects of a fermented food concentrate on immune function parameters in healthy volunteers." *Nutrition* 25.5 (2009): 499-505.

Key message: food consisting of fruits, nuts, and vegetables rich in [polyphenols](#) the results from this intervention study demonstrate promising physiologic effects of [immune regulation](#) on the innate immune system and antioxidative and anti-inflammatory parameters after supplementation.

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