

# Blackcurrant - A source of human health beneficial phytochemicals

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## Background and Benefits

Blackcurrants have been used in jams, juices, yoghurts, pies, wines and ice cream for many years. Although massively popular across Europe and Asia blackcurrants were previously banned in the US as they were a vector of white pine blister rust, a perceived threat to the US logging industry. However resistant blackcurrant varieties are now available and this treat no longer exists. This is timely since many reports have highlighted the potentially health beneficial phytochemical composition of blackcurrant.

Blackcurrant has a significantly large Vit C content, more than virtually any other commonly consumed soft fruit, and emerging research is further highlighting the benefits of this small black berry based largely on the polyphenolic content of the fruit and its associated products

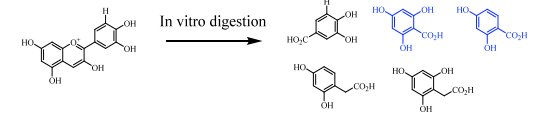
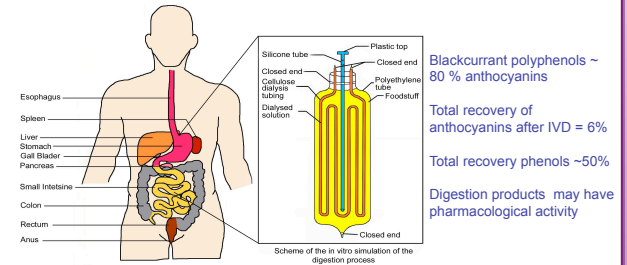
The rich, dark colour common in blackcurrants is due to high content of anthocyanins, predominantly 3-glucosides and 3-rutinosides of cyanidin and delphinidin. We have found that these components exhibit potent  $\cdot$ OH scavenging abilities and protection of endothelial cells in models systems.

Furthermore the anthocyanins have been shown to impact upon the  $\alpha$ -glucosidase phase of starch digestion thereby aiding in a reduction of sugar release during starch food digestion the release, a key point in a civilisation plagued with increasing levels of obesity, diabetes and heart disease.

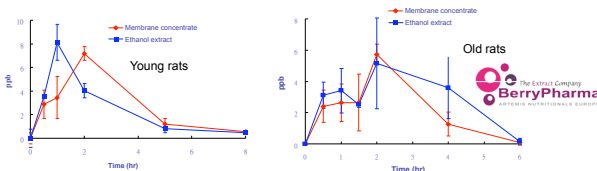
Blackcurrants are also a good source of glycosylated flavonols such as quercetin, myricetin and kaempferol. Modeling studies at the fundamental cellular level have shown that these compounds can interact with the bodies own innate Antioxidant Response Elements, such as the transcription factor Nrf2, and more specifically stimulate expression of the detoxification enzymes such as NAD(P)H:quinone oxidoreductase 1 etc.

More recently, studies by BerryPharma ([www.BerryPharma.com](http://www.BerryPharma.com)) have shown that the bioavailabilities of blackcurrant extracts prepared by different methods exhibit different bioavailabilities despite being >98% anthocyanins, and that there is an aged-related bioavailability response. Furthermore, this age response is translated through to gene expression. Interestingly, some of the genes up-regulated following blackcurrant extract consumption are related to stress and immune responses

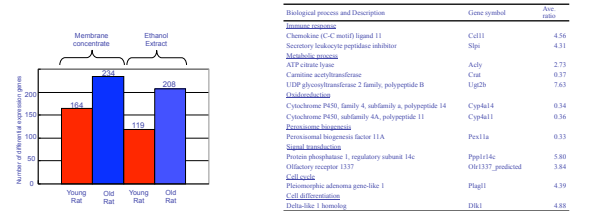
## Digestion Model System Studies



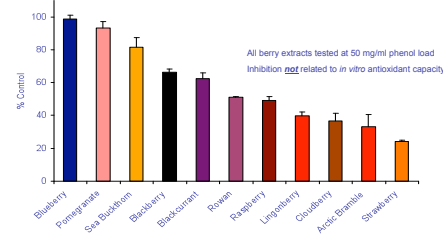
Relative rat serum bioavailabilities of anthocyanins derived from BerryPharma blackcurrant extracts prepared by membrane filtration and ethanol extraction; (8 weeks, feed with 10 mg anthocyanins/200g B.W)



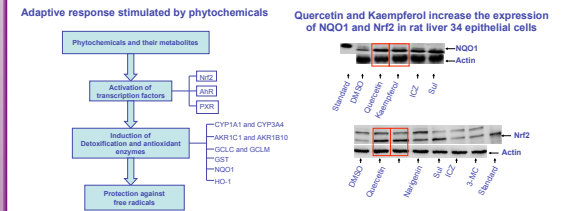
Number of differentially expressed genes in the liver or rats following feeding with the differently prepared blackcurrant extracts



Potency against colon cancer cells



## Impact of fruit phytochemicals on cancerogenesis



## Conclusion

Blackcurrant is already well established in Europe as a desirable and popular soft fruit and, as the health benefits surrounding it accrue, it will continue to make inroads into other markets world wide. Keep abreast of all developments regarding blackcurrant and health at <http://www.blackcurrantfoundation.co.uk/>

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