

Berries

As well as taste, color is one of the qualities that influences human beings' choice of some types of foods. Red, blue and violet are the attractive colors that tempt us to consume berries; these colors are created by a high level of anthocyanines. Much research has been carried out which suggests that polyphenolic compounds contained in fruits and their vehicles, rich in color, can have antioxidant properties as well as potent anti-inflammatory activities. The most abundant dietary flavonoids are flavonols (catechins and proanthocyanidins), anthocyanins and their oxidation products.

These studies were not conclusive since some phytochemicals of cranberries (BB) could have direct access to the brain after dietetic supplementation. In fact, while many studies have examined the plasma levels of flavonoids such as anthocyanins, no study has determined anthocyanins in the brain after supplementation. So, our study set out to determine whether different classes of anthocyanins could be found in the brain areas associated with cognitive and/or motor functioning after supplementation of BB (BBS).

Aged rats were fed with a diet of 2% of BB for 8 to 10 weeks. Anthocyanin tests were carried out on the diet as well as on different regions of the rats' brains (cerebellum, striatum cortex and hippocampus) for the control and conditions of the BBS. New techniques were applied in this investigation as we thought that because of the low quantities in the diet, low quantities of anthocyanins would be found. These techniques helped us to reach the detection levels of these compounds. Measurements were carried out with liquid chromatography (LC) along with spectrometry, total electrospray positive mode (ESIMS/MS) with two instruments: I) one total spectrophotometer with ion trap and II) one mass quadrupole triple spectrophotometer.

Results indicated that anthocyanins were found in all brain regions of the BBS rats. These were found mainly in the cortex and hippocampus. To our knowledge this is the first time that anthocyanins have been identified with the diet supplement in the fine tissue of the cerebellum. Our results demonstrate that anthocyanins can pass the blood brain barrier in the glycosylated form and can be localized in several important regions that affect memory and understanding. At the same time they can have an antioxidant effect.

In this way an optimum product such as cranberries may have important advantages in the progression index of neurodegenerative disease preserving the normal neuronal functioning.

This study was carried out in collaboration with:

- USDA Human Nutrition Research on Aging, Neuroscience Laboratory at Tufts University, USA;
- Dep. of Psychology, Simmons College, USA;
- Department of Nutrition & Food Science-CeRTA, University of Barcelona Spain;
- Scientific and Technical Services, University of Barcelona, Spain.

References:

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GROUP PUBLICATIONS:

- Andres-Lacueva C, Shukitt-Hale B, Galli RL, Jauregui O, Lamuela-Raventos RM, Joseph JA. Anthocyanins in aged blueberry-fed rats are found centrally and may enhance memory. Nutritional Neuroscience. 2005;8(2):111-120. [PubMed](#) [1]

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[1] <http://www.ncbi.nlm.nih.gov/pubmed/16053243>

