



Research Highlight

ANTHOCYANINS: POTENT THERAPEUTIC COMPOUND

Filza Kashif

Department of Botany,
University of Agriculture Faisalabad, Pakistan

Anthocyanin is derived from two Greek words i. e. *anthos* which means "flower" and *kyanous* which means "dark blue". Anthocyanins are natural colorants which belong to the flavonoid group of phenolic compounds.

Anthocyanins are the colored pigments found in the plant. They play essential roles in plant physiology, in the food industry and human health. Numerous studies have been performed to investigate the health-promoting effects of anthocyanins against some diseases, using *in vitro* and *in vivo* models¹. Approximately seventeen anthocyanidins have been reported which are found in nature. Six anthocyanins that are widely distributed are cyanidin (Cy), delphinidin (DP), petunidin (pt), peonidin (peo), pelargonidin (pl), and malvidin².

Although, several studies have reported the potential health benefits of anthocyanins from plants, but there is a need to cover the antioxidant capacity, anticancer and antimicrobial effects of anthocyanins. Therefore, a new study reviewed the health benefits of anthocyanins with anti-oxidative and antimicrobial effects, improving coronary heart disease, anti-obesity, and anti-diabetes, anticancer activities, improving neurodegenerative disorders and increasing visual acuity³.

Anthocyanins are the phenolic compounds that exhibit antioxidative properties. Antioxidants play an important role in the stimulation of physiological processes which reflects the improving vegetative growth. Antioxidants enhance the plant growth by increasing an enzyme activity as α -amylase and nitrate reductase, which accelerate the sugar translocation from the leaves to developing fruit⁴.

Several studies demonstrated that anthocyanins-rich foods such as berries, blackcurrant, and grapes exhibited great antioxidant properties. The compounds are able to scavenge free radicals and cease the chain reaction that will cause oxidative damage⁵.

Anthocyanins from berry extracts exhibited antimicrobial activity through different pathways, such as inducing damage to the cell wall, membrane and intercellular matrix⁶.

The study reported on the potential health benefits of anthocyanins in the prevention of several diseases. The purple pigments from plants have antioxidative, cardioprotective, antimicrobial, anticancer and several metabolic diseases including antiobesity and anti-diabetes potential. Anthocyanins also improve cognitive function and neurodegenerative disorder as well as visual acuity. These evidence-

Key words:

Anthocyanin antimicrobial cancer
health benefit obesity phenolic compounds
health complications antioxidative activities
colored pigment chain reaction
therapeutic potential pharmacology

based reports are useful for the scientific community to further research anthocyanin pigments and for the general public to fully utilize anthocyanins in the prevention of diseases.

Many studies have proven the efficacies of anthocyanins in the prevention of these diseases and improve general health. Although most studies did not specify the type of anthocyanin used, these studies reported the efficacy of anthocyanin-rich extracts from fruits and vegetables. However, the efficacy of anthocyanins is not mainly due to the compounds themselves. The synergetic effect of anthocyanins and other phenolic compounds is essential for the prevention of diseases as well as their antioxidative activities. In a nutshell, anthocyanins are the colored pigments isolated from plants with therapeutic effects in the prevention of several diseases and health complications.

REFERENCES

1. Bridle, P. and C.F. Timberlake, 1997. Anthocyanins as natural food colours-selected aspects. *Food Chem.*, 58: 103-109.
2. Prior, R.L. and X. Wu, 2006. Anthocyanins: Structural characteristics that result in unique metabolic patterns and biological activities. *Free Rad. Res.*, 40: 1014-1028.
3. Wang, H., G. Cao and R.L. Prior, 1997. Oxygen radical absorbing capacity of anthocyanins. *J. Agric. Food Chem.*, 45: 304-309.
4. Sharma, S., S.S. Sharma and V.K. Rai, 1986. Reversal by phenolic compounds of abscisic acid induced inhibition of *in vitro* activity of amylase from seeds of *Triticum aestivum L.* *New Phytol.*, 103: 293-297.
5. He, J. and M.M. Giusti, 2010. Anthocyanins: Natural colorants with health-promoting properties. *Annu. Rev. Food Sci. Technol.*, 1: 163-187.
6. Pojer, E., F. Mattivi, D. Johnson and C.S. Stockley, 2013. The case for anthocyanin consumption to promote human health: A review. *Compr. Rev. Food Sci. Food Saf.*, 12: 483-508.