



Article Id
AL04102

BLACK RICE'S FUNCTION IN HEALTH AND DISEASE

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Black rice is a variety of *Oryza sativa* L. rice that is used as a functional meal owing to its health benefits (Ryu *et al.*, 1998). Purple rice, forbidden rice, heaven rice, imperial rice, king's rice, and prized rice are all names for black rice (Kushwaha *et al.*, 2016). Vitamins, minerals, and dietary fibre are included in both brown and black rice. When compared to brown rice, however, black rice is preferable since it includes more protein and fibre. In addition, black rice has a significant number of antioxidants, which gives a variety of additional health advantages (Das *et al.*, 2014). The protein, vitamin, and mineral content of black rice is greater than that of white rice (Baenziger *et al.*, 2009). Black rice is high in critical amino acids like lysine and tryptophan, as well as vitamins like vitamin B1, B2, and folic acid, and minerals like iron, zinc, calcium, phosphorus, and selenium (Qiu *et al.*, 1993). All rice cultivars have the highest levels of antioxidants, protein, and dietary fibre, as well as phenolics, flavonoids, and anthocyanins (Gani *et al.*, 2012). Black rice is becoming increasingly popular and has several health advantages, including the prevention and treatment of illnesses and disorders including heart disease, cancer, diabetes, and high blood pressure, as well as the improvement of overall quality of life (Adom *et al.*, 2002).

Heart Health and Black Rice

Black rice has been shown to help prevent plaque build-up in the arteries. Plaque build-up in arteries can cause the arteries' walls to stiffen and become clogged. Black rice can lower the risk of cardiovascular and heart disease, while also enhancing heart health and function (Ling *et al.*, 2001). Including black rice in one's diet may assist to improve cardiovascular parameters by lowering triglycerides and increasing high density lipoprotein (HDL) cholesterol levels. This is the "good" cholesterol required for a healthy cardiovascular

system to operate correctly(Thanuja *et al.*, 2018). Dietary fibre is abundant in black rice. Dietary fibre, on the other hand, has been related to the prevention of heart disease, hypertension, stroke, and high blood sugar levels (Lobo *et al.*, 2010).

Brain Function and Black Rice

Anthocyanins' antioxidant properties help to improve brain function. This indicates that black rice can help to strengthen memory and lower the risk of illnesses including Alzheimer's, dementia, and depression. Anthocyanins were also found to assist boost learning ability and lessen depressive symptoms in clinical tests. By include black rice in your diet, you can aid to improve memory and avoid cognitive ageing (Jang *et al.*, 2012).

Cancer Prevention and Black Rice

Cancer is composed by the proliferation of abnormal cells that fail to respond correctly to normal regulatory mechanisms. Carcinogenesis, a multi-step process, is characterised by initiation, promotion, and progression of uncontrolled cells. Damage to deoxyribonucleic acid (DNA) occurs during the initiation phase, and during the promotion phase, cells multiply and expand into aberrant cells. Finally, in the advancement stage, these aberrant cells undergo further modifications, leading to the creation of malignant cells(Bueno *et al.*, 2012). Oxidative stress, which is the result of an imbalance between the production and the removal of reactive oxygen species (ROS) or reactive nitrogen species (RNS). ROS or RNS are commonly generated from exogenous and endogenous sources (Valko *et al.*, 2007). Excess production of ROS has been connected with carcinogenesis and damage to nucleic acids, proteins, or lipids. Oxidative stress plays an important role in the pathogenesis of many cancers (Puklauniget *et al.*, 2004). Cancer is also caused by the interaction of dietary, genetic, and environmental risk factors.

Conclusion

Owing to its nutraceuticality and functionality, black rice is gaining commercial popularity. Being an excellent alteration to brown and white rice, the consumption of black rice is increasing day to day all over. Research suggests black rice usher a number of problems like reduce the likelihood to develop illness or disease, and thereby supporting black rice consumption to promote the health of heart and liver, loss of weight, prevention of inflammation and cancer(Thanuja *et al.*, 2018).

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