

Advances in genetic improvement for tocotrienol production: a review

ABSTRACT

Tocotrienols are forms of vitamin E that are present in several important food crops. Compared to tocopherols, less research has been conducted on these compounds because of their low bioavailability and distribution in plant tissues. Both tocotrienols and tocopherols are known for their antioxidant and anticancer activities, which are beneficial for both humans and animals. Moreover, tocotrienols possess certain properties which are not found in tocopherols, such as neuroprotective and cholesterol-lowering activities. The contents of tocotrienols in plants vary. Tocotrienols constitute more than 70% and tocopherols less than 30% of the total vitamin E content in palm oil, which is the best source of vitamin E. Accumulation of tocotrienols also occurs in non-photosynthetic tissues, such as the seeds, fruits and latex of some monocotyledonous and dicotyledonous plant species. The use of biotechnological techniques to increase the tocotrienol content in plants, their biological functions, and benefits to human health are discussed in this review.

Keyword: Anticancer; Cholesterol-lowering; Neuroprotective ability; Tocopherols; Tocotrienols