

Plant carotenoids: molecular genetics and regulation

ABSTRACT

The potential health benefits of carotenoids as anti-cancer and antioxidant agents have recently been demonstrated. In particular, lycopene and β -carotene have lately been shown to be able to reduce the risk of chronic conditions of coronary heart disease, certain cancers and macular degeneration. The findings have led to rapid development in the field aimed at understanding the biosynthetic pathway and ultimately engineering the carotenoid content. This article reviews the recent progress made in the areas of molecular genetics and genetic engineering of plant carotenoids. The latest development in the regulatory mechanisms controlling the pathway is also highlighted. Finally, this review also highlights some recent progress made in oil palm carotenoid research, especially the molecular cloning of genes encoding key enzymes of the biosynthetic pathway and efforts to improve oil palm carotenoid content.

Keyword: Biosynthesis; Carotenoids; Genetic engineering; Oil palm; Regulation