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Carotenoids: The most potent phytochemicals in nature having health promoting activities

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Carotenoids are fat-soluble pigments widely distributed in nature. They comprise two main groups; carotenes and oxycarotenoids. Their distinctive pattern of alternating single and double bonds in the polyene backbone might be responsible to quench reactive oxygen species (ROS), while the nature of specific end groups on carotenoids may influence their polarity. Antioxidants help to control free radicals by quenching them by donating electrons to molecules before they damage other biomolecules of the cell or by reducing their energy or stopping their formation by interrupting oxidizing chain reaction. Scavenging of free radicals may be by gaining its "missing" electron by removing an electron from another molecule or to add itself to another molecule in its attempt to pair single electron, forming an adduct. In either case, the electron-rich character of carotenoids makes them attractive to radicals, thus sparing other cell components (DNA, RNA, carbohydrates, proteins, andlipids) from damage. Carotenes along with xanthophylls, astaxanthin, lycopene and lutein seem to offer protection against breast, lung,colorectal,uterine and prostate cancers. They help to prevent heart diseases, supplementation along with vitamin C and E reduce the risk of developing diabetes and to fight against Alzheimer's disease. They are generally regarded as safe (GRAS) but increased consumption of carotenoids may cause the skin to turn orange or yellow, known as "carotenodermia." This occurrence is completely benign and is unrelated to jaundice that can result from liver disease or other causes. Although it is tempting to formulate a cocktail of carotenoids with a desire to provide a full spectrum of health benefits but it is advised to take into consideration the health benefit to be targeted specifically.

Keywords: Carotenoids, Carotenes, Oxycarotenoids, Xanthophylls, Antioxidants, Free Radicals, Phytochemicals.

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Optimization of culture condition for production of acyltransferase activity of Pseudomonas sp. BR1 through response surface methodology approach

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Response surface methodology was applied to optimize the medium constituents and culture conditions for acyltransferase activity of amidase from Pseudomonas sp. BR1. Placket–Burmen design of the experiment revealed that glycerol, KH_2PO_4 and inducer have positive effect out of eleven independent variable on acyl transfer activity. A quadratic model was analysed as suitable model for amidase mediated acyltransferaseactivity analysis. Central composite design (CCD) was used to determine the quantitative effect of various variables having positive effect on acyltransferase activity. ANOVA analysis of the CCD model revealed that the medium containing (%, w/v) glycerol, KH_2PO_4 and inducer was most suitable production of acyltransferase by Pseudomonas sp. BR1. Validation of experiment was carried out under the optimized conditions and acyl transfer activity of 94.46 U/mg dcm was close to the predicted activity 93.82 U.ng dcm. After optimization with CCD, there was an increase of 17%in acyltransferase activity, from 77.2 U/mg dcm to 94.4U/mg dcm as compared to un-optimized conditions and the bioconversion of hydroxamic acid was significantly improved.

Biography

Ravi Kant Bhatia working as a Ph.D Research Scholar in Department of Biotechnology, Himachal Pradesh University, Shimla under the supervision of Prof. TC Bhalla. He is MSc and M Phil in Biotechnology having UGC-RGNF-SRF. He is working on acyltransferase activity of amidase from Pseudomonas sp. BR1. He has attended various workshops and published abstracts in various national and international conferences.

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