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Lettuce and its anti-proliferative effects

Vijayakumar RP

The risk of developing several types of cancer could be reduced with the consumption of vegetables that are rich in phenolic compounds. These phenolic compounds contribute health-promoting effects and could be obtained from vegetables that are generally eaten fresh so that more ingredients remain intact. In consequence, lettuce, particularly Lactuca sativa L. is one such vegetable consumed fresh worldwide. Lettuce is considered to be effective against cancer and other diseases as it contains various phenolic compounds, such as 2,3-dicaffeoyltartaric acid, riboflavin, thiamine, vitamin K, etc. The phenolic compounds have been reported to reduce metastasis, induce apoptosis, and inhibit cell proliferation but these compounds are generally present in small quantities in lettuce under conventional cultivation conditions. Hence, researchers have focused on enhancing their accumulation by understanding the underlying factors. The proper nitrogen limitation has increased their levels in lettuce. Further evaluation of those compounds has shown the anti-proliferative effects against Caco-2 cells (immortalised cell line of human colorectal adenocarcinoma cells). Thus reduced nitrogen supply helps in modifying phenolic composition in lettuce, thereby enhancing its anticancer activity. Therefore, from a nutritional standpoint, enhancing the phenolic accumulation in vegetables in the interests of human health through management of nitrogen availability would be beneficial because their consumption is associated with not only a decreased risk of developing cancer but also many chronic degenerative diseases.

Keywords: Lettuce, Lactuca sativa L., Cancer treatment, Phenolic compounds, Reduced nitrogen supply

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