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Letter to the editor:

RECENT ADVANCES IN B-CAROTENE: BIOLOGICAL ACTIVITIES, THERAPEUTIC POTENTIAL, AND DELIVERY STRATEGIES

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Carotenoids are naturally occurring pigments that are abundant in a wide range of photosynthetic organisms, including algae, cyanobacteria, and higher plants. In photosynthetic tissues, they contribute to light harvesting and photoprotection, while their nutritional and potential health-promoting properties have also attracted considerable scientific interest (Mezzomo and Ferreira, 2016). Carotenoids also confer yellow, orange, and red colours on flowers and fruits, thereby contributing to pollinator attraction and seed dispersal (Maoka, 2020). Because most animals cannot synthesise carotenoids de novo, they obtain them primarily from the diet (Rodriguez-Concepcion et al., 2018).

β-Carotene is a common dietary carotenoid and a major provitamin A carotenoid. In humans, approximately 17–45 % of ingested β-carotene may reach the peripheral circulation intact, indicating that a substantial proportion can be absorbed without conversion to vitamin A (Shete and Quadro, 2013). Major dietary sources include green leafy vegetables and orange- or yellow-coloured fruits and vegetables such as mango, carrots, spinach, pumpkins and broccoli (Mezzomo and Ferreira, 2016).

β-Carotene has been investigated in relation to cardiovascular disease, cancer, and ocular health, owing partly to its antioxidant properties and its role as a vitamin A precursor (Brambilla et al., 2008; Hamilton, 2007; Jeon et al., 2011; Johra et al., 2020). However, evidence supporting its disease-preventive effects requires further investigation. Given the expanding literature on the biological activities, therapeutic potential, and delivery strategies of β-carotene, this letter highlights selected recent advances in these areas (Supplementary Table 1).

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Conflict of interest

The authors declare no conflict of interest.

Artificial Intelligence (AI) – assisted technology

The authors used ChatGPT solely to improve English language, readability, and clarity of text. The authors reviewed and edited AI-assisted output and take responsibility for the content of the manuscript.

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