

Studies about the effect of carotenoids from thermophilic bacteria on the stability of biological membranes

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Polar carotenoids are known to stabilize lipid bilayer membranes. We investigated the membrane-stabilizing effect of three synthesized polar carotenoids, thermozeaxanthin (TZ), zeaxanthin-glucoside (ZG) and zeaxanthin (Z), using the fluorescent calcein-leakage measurement from the calcein-entrapped liposomes composed of dipalmitoylphosphatidylcholine (DPPC). The addition of TZ stabilized the liposomal membranes composed of DPPC at pH values ranging from 4.0 to 10.0. The addition of three carotenoids, TZ, ZG and Z, stabilized the membrane at acidic and neutral pH values ranging from 4.0 to 7.5. The values of leakage were lower at 30 °C and highest at 40 °C and subsequently, gradually decreased at the higher temperature. The addition of TZ and Z stabilized the membranes, whereas, ZG destabilized the membranes at a temperature higher than 50°C. In addition, the membrane-stabilizing effect of the carotenoids with the calcein-entrapped liposomes composed of lipids extracted from *Thermus thermophilus* were investigated. The addition of TZ resulted in stabilization of the membrane at all ranges of pH values. However, the addition of Z and ZG destabilized the membrane.