

Interaction of prenylated chalcones and flavanones from common hop with phosphatidylcholine model membranes.

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Streszczenie

Common hop (*Humulus lupulus*) constitutes a source of numerous prenylated chalcones such as xanthohumol (XH) and flavanones such as 8-prenylnaringenin (8-PN) and isoxanthohumol (IXH). Range of their biological activities includes estrogenic, anti-inflammatory, anti-infective, anti-cancer, and antioxidant activities. The aim of the present work was to characterize the influence of prenylated polyphenols on model 1,2-dipalmitoyl-*sn*-glycero-3-phosphocholine (DPPC) membranes by means of differential scanning calorimetry (DSC), fluorescence and attenuated total reflection Fourier transform infrared (ATR-FTIR) spectroscopies. All studied compounds intercalated into DPPC bilayers and decreased its melting temperature as recorded by DSC, Laurdan and Prodan fluorescence, and ATR-FTIR. Polyphenols interacted mainly with glycerol backbone and acyl chain region of membrane. Magnitude of the induced effect correlated both with lipophilicity and molecular shape of the studied compounds. Elbow-shaped 8-PN and IXH were locked at polar–apolar region with their prenyl chains penetrating into hydrophobic part of the bilayer, while relatively planar XH molecule adopted linear shape that resulted in its deeper insertion into hydrophobic region. Additionally, by means of DSC and Laurdan fluorescence IXH was demonstrated to induce lateral phase separation in DPPC bilayers in gel-like state. It was assumed that IXH-rich and IXH-poor microdomains appeared within membrane. Present work constitutes the first experimental report describing interactions of prenylated hop polyphenols with phospholipid model membranes.

Słowa kluczowe

DPPC model membranes, 8-Prenylnaringenin, Xanthohumol, Isoxanthohumol, Microcalorimetry (DSC), ATR-FTIR

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