THE INTERACTION OF ZEARALENOE AND STEARIC ACID IN ARTIFICIAL CELLULAR MEMBRANES

MARIA FILEK, IZABELA MARCIŃSKA and JOLANTA BIESAGA-KOŚCIELNIAK
Department of Plant Physiology, Polish Academy of Sciences, Podłużna 3, 30-239 Kraków, Poland

Zearalenone, an estrogenic substance, was first isolated from extracts of the fungus *Gibberella zea* (Fusarium graminearum). Its chemical structure was determined as 6-(10-hydroxy-6-okso-trans-1-undecenyl)-B risolic acid lactone. Endogenous zearalenone has also been found in many plant species. Our previous experiments revealed that zearalenone can stimulate the growth and differentiation of wheat callus tissue. Moreover, its effect in flowering processes indicates the possibility of using zearalenone as a plant hormone. This paper reports on the results of studies undertaken to verify the potential influence of zearalenone on the structure of stearic acid (the model of the hydrophobic part of cell membrane). Stearic acid exists in almost all the phospholipids and glycolipids of plant membranes. Because of its high sensitivity, the X ray diffraction method can be successfully used to investigate the structural interaction between various substances. It is also suitable in studies of the structural changes of chemicals under the influence of temperature. Homogenous phases of stearic acid and stearic acid mixed with zearalenone (100 : 0.1 w/w) were prepared at 5 °C and 20 °C. Powder X-ray diffraction patterns were recorded using a Philips 1710 diffractometer with Fe-filtered Co Kα radiation (40 kV, 30 mA) in step mode (step size: 0.02 [° 2θ], t.p.s.: 2s).
The X-ray diffraction pattern of stearic acid mixed with zearalenone showed slight shifts in position and clear changes in the intensities of the diffraction maxima compared to the clear acid. At low temperatures (5 °C), this effect was enhanced. It is suggested that zearalenone can interact with stearic acids, stabilising their saturation and inducing the appearance of local ripples in the hydrophobic phase.

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