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Electrospray mass spectrometry and tandem mass spectrometry of the natural mixture of cyclic peptides from linseed.

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Streszczenie

The cyclic peptides from linseed are composed exclusively of the hydrophobic amino acids: Phe, Leu, Ile, Val, Met, Pro and Trp.

Because these compounds do not contain functional groups which undergo protonation or deprotonation easily, their ionization

in solvents usually used for peptide analysis is not efficient. A rapid and sensitive procedure for the detection and structure elucidation

of the cyclic peptides based on ionization with Na+ and NH4+ ions is described. A cationization of methionine-containing

peptides with methyl iodide has been described also. The extract of Linum utitatissimum seeds was analyzed directly using electrospray ionization mass spectrometry and neutral loss electrospray ionization tandem mass spectrometry techniques. The analysis

confirms the presence of cyclolinopeptides reported previously: CLA [c(Pro–Pro–Phe–Phe–Leu–Ile–Ile–Leu–Val], and CLB [c(Pro–Pro–Phe–Phe–Val–Ile–Met–Ile–Leu)]. Cyclolinopeptides CLC, CLD, CLE and CLG, which contain methionine oxide,

were detected in relatively small quantities. These peptides probably result from the oxidation of their precursors which were

not reported: CLD′ [c(Pro–Phe–Phe–Trp–Ile–Met–Leu–Leu)], CLE′ [c(Pro–Leu–Phe–Ile–Met–Leu–Val–Phe)], CLF [c(Pro–Phe–Phe–Trp–Val–Met–Leu–Met)] and CLG [c(Pro–Phe–Phe–Trp–Ile–Met–Leu–Met)], present at higher concentrations in the extract protected from atmospheric oxygen. The sequences of the unreported cyclic peptides were proposed on the basis of collision-

induced dissociation experiments and homology with peptides described by Morita1,2 and supported by the fragmentation of synthetic analogs of CLA of a known structure.

Słowa kluczowe

cyclic peptides, electrospray, collision-induced dissociation, neutral loss, linseed

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