Biosynthetic studies of nudicaulins in laser-microdissected petal cell of Papaver nudicaule by the use of NMR spectroscopy and hyphenated technique LC-NMR

From 2008-05-01 to 2010-04-30, closed project

Objective

Nudicaulins is a group of alkaloids compounds present in petals of Papaver nudicaule (Iceland poppy) flower. That class of compounds represents a further group of coloured alkaloids and their accumulation in petals could enhance the attraction of flowers for insects. The elusive structure of these pigments, responsible about the dark yellded petal variety of Papaver nudicaule, attracts our interest about the biosynthetic formation which is still unknown. Moreover there is a fascinating debate about the formation of these unique compounds if derived by Diels Alder or ionic (4+2) cycloaddition of indole. Through those pigments, seem to occur exclusively in petals of flower and the final biosynthetic step is expected to be performed very likely in petals as well. It is not clear whether the precursors are preformed in other plant parts, nor if there are special storage cell in petals. Biosynthetic studies consisted either of injection of labelled precursors to plant material at a reasonable time before their derived isotopomers identification, either to use of a non invasive application such as the illumination of plant for a few hours in atmosphere of synthetic air enriched with 13CO2, resulted to isotopologues production. The collected plant material is going to be treated with laser-assisted microdissection in order to obtained the important for our research single plant cells or specific cell population containing the under study compounds, succeeded an important enrichment of the sample. Usually, the labeled sample material is analyzed by liquid chromatography and isolated compounds identified by Nuclear Magnetic Resonance spectroscopy. Moreover in present work we are going to analyze the microdissected plant material by the newly established hyphenated technique LC-NMR, and develop the analysis of results from detection of isotopomers or isotopologues with direct or indirect methods.

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Result In Brief
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Subjects

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