Pollen and vegetative microspores as sensitive systems for ozone

The high ground-level ozone concentrations (higher than 0.1 ?l/l per hour, in which there is a characteristic odor) is an biggest danger for human health. In environmental biomonitoring of O_3 hazardous concentrations in air or chronic levels of this gas (less than 0.05 ?l/l for 10 h) indication of early reactions of living organisms to O_3, or cellular damages caused is very important, and the using plant cells as bioindicators has some preferences.

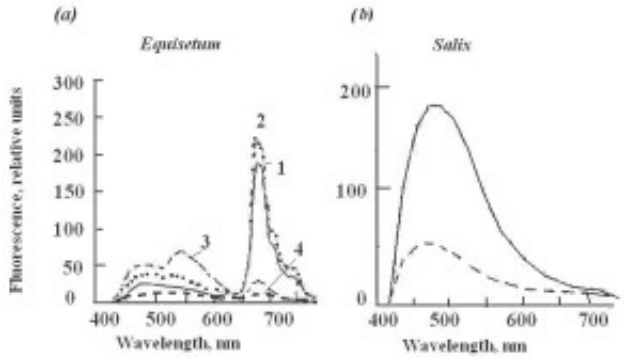

Fig. 1. Effect of ozone on the changes in the autofluorescence spectra of the plant microspores. Measurement of the spectra was by using laser-scanning confocal microscopy (405 nm laser),a. vegetative microspores Equisetum arvense: 1-control, 2-4 – total doses of ozone 0.012, 0.032, 0.2 ?l/l. b. pollen Salix caprea after ozone fumigation in a total dose of 0.012 ?l/l .

Autofluorescence of plant microspores served for reproduction -vegetative microspores of spore-bearing plants or generative (pollen that means male gametophyte) in seed-bearing species can be an indicator in early diagnosis of ozone effects on the single models.

Formation and accumulation of stress metabolites, including biogenic amines known as neuromediators also occurs under the influence O_3 and may be determined by fluorescent histochemical methods. Pollen sensitivity has been shown to germinate in the presence of various concentrations of ozone in the maize Zea mays, mock orange Philadelphus grandiflorus, knight's star Hippeastrum hybridum and plantain Plantago major, well as horsetail vegetative microspores Equisetum arvense. Moreover, it is shown that high concentrations of ozone increased allergenicity by some pollens.

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Fluorescent analysis for bioindication of ozone on unicellular models.
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