

**ECOLOGICAL TYPES OF TOLERANCE LIME (*TILIA L.*) BY
PHOTO- AND THERMOINDUCED CHANGES OF CHLOROPHYLL
FLUORESCENCE LEAFS.**

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The spectral methods of the research have become very popular recently. They are based on the spectral characteristics of the leaf tissues. Higher plants have proliferated a wide range of internal leaf structures including many optical elements, for example pigments, vitamins, proteins, growth regulators etc.

Plant leaves are the primary photosynthesizing organs, significantly affecting important planetary biogeochemical cycles. At the same time the leaf of the higher plants has the difficult optical properties what have a high ability to use solar energy very effective.

The mechanisms of how leaf chemistry, structure and orientation interacts with the light environment, however, remains incompletely understood. Quantitative relationships between optical characteristics and plant biochemical properties depend on many environmental and species factors. The response to leaf aging or environmental stresses is well known to reduce chlorophyll content, which in turn increases both the reflectance and transmittance in the visible spectrum.

Lindens are the most spread leaf species in Kyiv urban plantings. At the same time the state of the trees is getting worse and worse from year to year. The leaf blades of lindens have intensive defoliation (marginal necrosis and chlorosis). It can be caused by numerous factors that restrict the flow of water to the leaves, such as drought, salt damage (fertilization), root rot, cankers, excessive heat, and chemical injury. Using the photo- and thermo-inductive changes of the chlorophyll fluorescence we estimated the influence of the urban factors on the state of the photosynthetic leaf area of the genus *Tilia L.* species. By using the high sensitive method of the spectral analysis the possible reasons of the linden tree leaves photosynthetic activity depression in Kyiv urban plantings were determined. We

used F_{\max}^{680} , F_{st}^{680} (1), F_{st}^{680} (2), F_{st}^{530} ; K_i and K_s parameters and F_{ta}^{680} , $F_{t\beta}^{680}$, F_t^{530} , F_t^γ/F_t^β , $\tau^{\beta-\gamma}$, $F_{\max}^{680}/F_{t\beta}^{680}$ parameters.

It was found that the main reasons of marginal leaf necrosis and chlorosis are drought of the ground and salt damage. The plants in street plantings don't get enough water during the hot period of the year. Using the table salt causes sodium (Na) and potassium (K) imbalance in leaf cells. It causes marginal defoliation of the linden leaves. The main content of table salt has little-leaf linden (*Tilia cordata* Mill.). It was connected with the parameters of the photo- and thermo-induction changes of chlorophyll.