

СЪЮЗ НА УЧЕНИТЕ В БЪЛГАРИЯ

Секция "Биология"

ИНСТИТУТ ПО БИОРАЗНООБРАЗИЕ И ЕКОСИСТЕМНИ ИЗСЛЕДВАНИЯ - БАН

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maximal quantum yields in dark- and light-adapted states and in the non-photochemical quenching. In addition, observed changes in energy redistribution between the two photosystems, slight decrease of the flash-induced oxygen yields and oxygen burst amplitudes, as well alterations of thermodynamic parameters (thermal transitions) of thylakoid membranes from EBR treated leaves suggest structural reorganizations of the main protein complexes in the membranes.

Conclusions: These EBR induced effects are most probably involved in the adaptive responses of plants against different stress factors.

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RELATIONS BETWEEN MORPHOLOGICAL DEVELOPMENT, ESSENTIAL OIL PROFILE AND PHYSIOLOGICAL STATUS OF *ARTEMISIA ALBA* IN VITRO

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The variability of essential oils of *Artemisia alba* has been attributed to environmental conditions, geographic distribution or to genetic factors. Previously we established that modifications of plant growth regulators (PGR) bring about significant alterations of the essential oils obtained by the shoots of *A. alba*.

The aim of the present work was to conduct a broader study on the developmental and biochemical basis of factors affecting terpenoid biosynthesis in this species.

Materials and methods: 77 K steady state fluorescent emission spectra were recorded on thylakoid membranes isolated from the aerial parts of shoots cultures grown in media with modified supplementation of PGR.

Results: The differences in the structural organization of photosystem II (PS II), were shown to be related to the morphological development and essential oil types observed. Thus, extensive root development was associated with a higher degree of aggregation of PS II peripheral antennae, accompanied by strong domination of the monoterpenoids in the oils. This feature was observed in PGR-lacking control and in media, supplemented with 0.5 and 1.0 mg/l indole-3-butyric acid (IBA). On the contrary, intensive callusogenesis, absence of a root system and extensive aerial parts development led to decrease in the peripheral antennae aggregation and domination of sesquiterpenoids in the oils (combinations of 0.2 mg/l benzyladenine with both 0.5 mg/l and 1.0 mg/l IBA).

Conclusions. It is well established that PS II is highly sensitive to environmental stress factors and inherent growth and development regulators, and is enrolled in several protective mechanisms. For the first time we demonstrate that there is also a relation between its structure and the factors affecting terpenoid biosynthesis in *A. alba*.