



7th CMAPSEEC

Conference on Medicinal and Aromatic Plants of Southeast European Countries

organized by

Association for Medicinal and Aromatic Plants
of Southeast European Countries (AMAPSEEC)

&

Institute for Medicinal Plant Research
"Dr Josif Pančić", Belgrade, Serbia

BOOK OF ABSTRACTS

27th-31st May, 2012
Subotica, Republic of Serbia

GROWTH REGULATORS AFFECT DEVELOPMENTAL PATTERNS, TERPENOID PROFILE AND PHOTOSYSTEM II STRUCTURE IN *ARTEMISIA ALBA TURRA* IN VITRO

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Artemisia alba Turra is a fragrant shrub, distributed in Southern Europe. Its essential oil possesses strong spasmolytic and antimicrobial properties. Research has revealed great variability of its terpenoid profile, attributed by different authors to environmental conditions, geographic distribution or to genetic factors. Our previous research showed that modifications of plant growth regulators (PGR) in the medium bring about significant alterations of the essential oils obtained by the shoots of *A. alba*. This motivated us to conduct a broader study in order to better understand the developmental and biochemical basis of factors affecting terpenoid biosynthesis in this species. In the present work, 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. 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). 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 *Artemisia alba* Turra.

Keywords: *Artemisia alba* essential oil, terpenoid biosynthesis, growth and development, photosystem II structure in vitro.