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BOOK OF ABSTRACT

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# EFFECT OF PLANT GROWTH REGULATORS ON GROWTH PATTERNS AND PHYSIOLOGICAL STATUS OF *HYPERICUM CALYGINUM* SHOOT CULTURES

GALINA TRENEVA<sup>1</sup>, YULIANA MARKOVSKA<sup>1</sup>, EVELYN WOLFRAM<sup>2</sup>,  
KALINA DANOVA<sup>3\*</sup>

<sup>1</sup> Faculty of Biology, Sofia University St. Kliment Ohridski

<sup>2</sup> Zürcher Hochschule für angewandte Wissenschaften (ZHAW), Life Sciences und Facility Management - Institut für Biotechnologie, Wädenswil, Switzerland

<sup>3</sup> Institute of Organic Chemistry with Centre of Phytochemistry, Bulgarian Academy of Sciences

\*Corresponding author: k\_danova@abv.bg

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St. John's Wort (*Hypericum perforatum*) is a medicinal plant species of high economic value and used in phytopharmaceutical preparations worldwide. The wide array of its pharmacological activities is due to the complexity of the Herba Hyperici extract comprising different classes of compounds as phenolics, flavonoids, terpenoids, phloroglucinols, as well as naphthodianthrones hypericin and pseudohypericin. In the recent years an increasing interest has been recorded in the investigation of pharmacologically relevant secondary metabolites production by different *Hypericum* species in the controlled environment of plant cell tissue and organ culture. Unlike the widely studied *H. perforatum* and other closely related hypericin producing species, only scarce tissue culture studies have been dedicated to representatives of the more primitive sections, characterized by the lack of hypericin production. *Hypericum calycinum* belongs to the more primitive Ascyreia section of the genus and is characterized by the lack of hypericins production. Research has revealed its commensurable antidepressant activity, as compared with *H. perforatum*.

The present work studies the effect of exogenous benzyl adenine (BA) and indole-3-butyric acid (IBA) treatments on the developmental patterns, polyphenolics production and status of enzymatic antioxidant defence of hypericin non-producing *Hypericum calycinum* shoot cultures. It was shown that supplementation of plant growth regulators (PGR) led to an increase of phenylalanine ammonia-lyase and superoxide dismutase, but inhibited catalase, glutathione reductase, ascorbate peroxidase activities, as well as levels of polyphenolics and ratios of reduced/oxidised glutathione and ascorbate/dehydroascorbate in comparison with plant growth regulators-free control. Further on, it was established that elevation of IBA concentration stimulated axillary shoot formation and shoot length, but inhibited polyphenolic levels in vitro. These results are in agreement with our previous results on interrelations between biomass formation and polyphenolics production in other *Hypericum* species in vitro. In vitro culture system optimization is in progress in order to increase biomass production and retain biosynthetic capacity of the species.