

Accepted Manuscript

Regulation of the membrane structure by brassinosteroids and progesterone in winter wheat seedlings exposed to low temperature

Maria Filek, Elżbieta Rudolphi-Skórska, Apolonia Sieprawska, Miroslav Kvasnica, Anna Janeczko

PII: S0039-128X(17)30182-4

DOI: <https://doi.org/10.1016/j.steroids.2017.10.002>

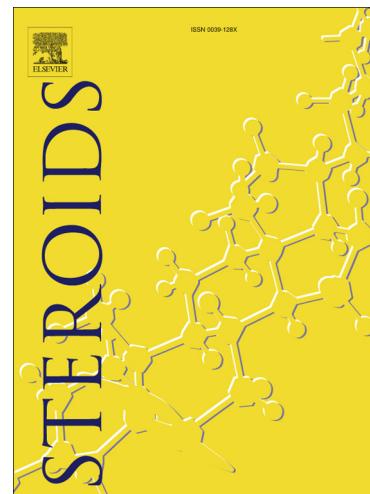
Reference: STE 8166

To appear in: *Steroids*

Received Date: 6 April 2017

Revised Date: 2 October 2017

Accepted Date: 5 October 2017



Please cite this article as: Filek, M., Rudolphi-Skórska, E., Sieprawska, A., Kvasnica, M., Janeczko, A., Regulation of the membrane structure by brassinosteroids and progesterone in winter wheat seedlings exposed to low temperature, *Steroids* (2017), doi: <https://doi.org/10.1016/j.steroids.2017.10.002>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Regulation of the membrane structure by brassinosteroids and progesterone in winter wheat seedlings exposed to low temperature

Maria Filek^a, Elżbieta Rudolphi-Skórska^b, Apolonia Sieprawska^b, Miroslav Kvasnica^c, Anna Janeczko^{a*}

^a*Polish Academy of Sciences, The Franciszek Górski Institute of Plant Physiology, Niezapominajek 21, 30-239 Kraków, Poland*

^b*Department of Biochemistry, Biophysics and Biotechnology, Institute of Biology, Pedagogical University, Podchorążych 2, 30-084 Krakow, Poland*

^c*Laboratory of Growth Regulators, Centre of the Region Haná for Biotechnological and Agricultural Research, Institute of Experimental Botany ASCR & Palacký University, Šlechtitelů 27, 78371 Olomouc, Czech Republic*

* - corresponding author

Phone: 48-12-425-18-33

Fax: 48-12-425-18-44

e-mail: ania@belanna.strefa.pl

Maria Filek: mariafilek@excite.com

Elżbieta Rudolphi-Skórska: erudolphi5@gmail.com

Apolonia Sieprawska: apolonia.sieprawska@gmail.com

Miroslav Kvasnica: kvasnica@ueb.cas.cz

Anna Janeczko: ania@belanna.strefa.pl

Abstract

Steroids constitute one of the most important groups of compounds of regulatory properties both in the animal and plant kingdom. In plants, steroids such as brassinosteroids or progesterone, by binding to protein receptors in cell membranes, regulate growth and initiate processes leading to increased tolerance to stress conditions. Due to their structural similarities to sterols, these steroids may also directly interact with cellular membranes. Our aim was to determine the changes of the structural parameters of lipid membranes under the influence of hydrophobic steroid compounds, i.e. 24-epibrassinolide (EBR) and its precursor — 24-epicastasterone (ECS) and progesterone (PRO). Lipids were isolated from wheat seedlings with different tolerances to frost, grown at low temperatures (5°C) for 1.5 and 3 weeks (acclimation process). Control plants were cultured continuously at 20°C. From galactolipids and phospholipids, the main polar lipid fractions, the monolayers were formed, using a technique of Langmuir trough. EBR and ECS were introduced into monolayers, together with lipids, whereas the PRO was dissolved in the aqueous sub-phase upon which the monolayers were spread. Measurements performed at 25°C and 10°C showed a significant action of the tested compounds on the physicochemical properties of the monolayers. EBR and PRO increased the area per lipid molecule in monolayers, resulting in formation of more flexible surface structures while the presence of the ECS induced the opposite effect. The

Download English Version:

<https://daneshyari.com/en/article/8366586>

Download Persian Version:

<https://daneshyari.com/article/8366586>

[Daneshyari.com](https://daneshyari.com)