

ANTIOXIDANT ENZYMES INVOLVED IN SEEDS' GERMINATION MODULATED BY ACTIVE PRINCIPLES FROM PLANT EXTRACTS AND HYDROLYZED PROTEINS

Brandușa Georgiana DUMITRIU¹, Laura OLARIU^{2*}, Manuela Diana ENE³,
Stelica CRISTEA⁴, Mihaela Doina NICULESCU⁵, Norina Consuela FORNA⁶,
Alina LUPU (ȘURLEA)⁷, Natalia ROSOIU⁸

¹ PhD, biochim., Senior Researcher III, Biotehnos SA, Otopeni, Ilfov, Romania, (dbandrusa@biotehnos.com).

² PhD, biofiz., Senior Researcher I, Biotehnos SA, Otopeni, Ilfov, Romania, Corresponding member of the Academy of Romanian Scientists (lolariu@biotehnos.com).

³ PhD, Eng. Biochim., Senior Researcher III, Biotehnos SA, Otopeni, Ilfov, Romania, (diana.ene@biotehnos.com).

⁴ Univ. Prof. PhD. Stelica Cristea, University of Agricultural Science and Veterinary Medicine from Bucharest, Romania, stelicacristea@yahoo.com

⁵ PhD Eng., Research and Development National Institute for Textiles and Leather-Division Leather and Footwear Research Institute Bucharest, 93, Ion Minulescu Str., Bucharest, sector 3, 031215, Romania. mihaelaniculescu59@yahoo.com

⁶ Prof. PhD. UMF Grigore T.Popa Iasi Faculty of Dental Medicine Full member of the Academy of Romanian Scientists Profforma@gmail.com

⁷ PhD Student of ISD-UOC - Doctoral School of Applied Science " Ovidius", University of Constanța, România Email: sl_alina@yahoo.com

⁸ Prof. Emeritus, Senior Researcher I, PhD, Faculty of Medicine and Doctoral, School of Applied Sciences, Biology / Biochemistry Section, "Ovidius" University of Constanta, Romania, Full member of the Academy of Romanian Scientists, Biological Sciences Section President, Bucharest, Romania. (natalia_rosoiu@yahoo.com)

Corresponding autor * : Laura Olariu, lolariu@biotehnos.com

Abstract. *Transition to organic farming requires the development of new methods to protect seeds from adverse factors. The germinative process and the post-germinative phase are strictly controlled by the oxidative balance involving lipid peroxidation, reactive oxygen species and enzymes activity, directing the plant viability and its further development. We focus our studies mainly on the seeds protection and fortification through natural solutions based on marigold and fenugreek extracts, steroid alkaloids from tomatoes and hydrolyzed proteins derived from leather waste industry. The structural configuration of the plant protection products proves significant effects fighting on different mechanisms of seeds' oxidative stress. As well as the experimental design highlighted a tandem correlative mechanism between germination, decrease of lipid peroxidase and activation of catalase and superoxide-dismutase. SEM-PROTECT II was the most active biopesticide involved in these processes. Our findings directed complex research oriented to technological and experimental optimizations for the development of an innovative, efficient and competitive plant protection product to meet modern agriculture requirement.*

Keywords: germination, antioxidant, peroxidase, catalase, germinative energy

DOI [10.56082/annalsarscibio.2024.1.89](https://doi.org/10.56082/annalsarscibio.2024.1.89)