

## MOLECULAR AND GENETIC ASPECTS OF SUNFLOWER DEFENSIVE RESPONSE TO DOWNY MILDEW

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### ABSTRACT

Sunflower represents one of the most important oilseed crops worldwide. In Republic of Moldova it is placed third after wheat and maize according to cultivated area. An excessive extension of cultivated areas and high susceptibility of this crop to wide number of diseases determine necessity of obtaining of resistant hybrids. One of the most devastating pathogens of sunflower is downy mildew (DM) *Plasmopara halstedii*, which causes significant yield losses in rainy years. In this context, the aim of this study was to determine resistance potential among sunflower genotypes from RM and some key processes within molecular mechanisms of genetic control of sunflower downy mildew resistance. Performed study included genotyping of sunflower lines using SSR markers, screening of *Pl1* and *Pl6* downy mildew resistance genes and expression studies of 22 genes involved in ROS metabolism and Systemic Acquired Resistance (SAR). The resistance potential of sunflower genotypes cultivated in RM was estimated. *Pl1* gene was identified in 36 genotypes, *Pl6* gene – in 37 and both genes were identified in 24 genotypes. Investigations related to gene expression revealed new insights of sunflower DM resistance mechanism such as differential expression of genes involved in maintenance of oxido-reduction homeostasis in function of infection degree; involvement of transcription factor *Why1* from Whirly family in insurance of sunflower response to *P. halstedii* attack.

**Key Words :** sunflower, downy mildew, resistance genes, defensive response