

COMPARATIVE STUDIES ON WHEAT AND MUSTARD RESPONSES TO ALLELOCHEMICALS OF SUNFLOWER ORIGIN**Gawronska H.^{1*}, Bernat W.¹, Janowiak F.², Gawronski S. W.¹***Department of Pomology and Basic Natural Sciences in Horticulture
Faculty of Horticulture and Landscape Architecture, Warsaw Agricultural University,
ul. Nowoursynowska 166, 02-787 Warsaw, Poland**²Institute of Plant Physiology, Polish Academy of Sciences
Podluzna 3, PL-30-239 Krakow**(* corresponding author: gawronska@alpha.sggw.waw.pl)*

Higher tolerance of cereals especially of wheat to allelochemicals of sunflower origin is reported. Our earlier studies showed that, wheat germinability was almost not affected by leaves and stems aqueous extracts of 10 sunflower cvs. (Ciarka et al., 2002a, b). Contrary, wheat density in the field was reduced by sunflower mulch though to much lower degree than most weed species accompanying the crop (Gawronski et al., 2002, Gawronski, 2003). To elucidate the basis of higher wheat tolerance to allelopathy stress generated by sunflower a series of studies are conducted in our group. This is continuation of comparative studies on the allelopathic effects of sunflower on wheat and mustard performance by evaluation of: (i) seed germination and seedling vigour, (ii) plant gas exchange, (iii) membrane integrity and of (iv) changes in the stress hormones levels.

Seeds, seedlings and plants of winter wheat (*Triticum aestivum* L. “Zyta”) and of mustard (*Sinapis alba* L. “Nakielska”) were used. Seeds were cultured in Petri dishes or on rolled paper in the presence of aqueous extracts of sunflower leaves (2.5, 5.0 and 10% DMw/v) and on the 6th day germination, seedling length and weight were recorded. Five week-old, hydroponically grown plants were treated with the extracts at 6 concentrations up 72 or 120 hr and relative water content, osmotic potentials, diffuse leaf resistance, transpiration, photosynthesis, leaves and roots membrane integrity, ethylene emission and ABA levels were measured.

Results of these studies confirmed that wheat germination, even at highest concentration, was almost not, while of mustard was strongly affected by sunflower allelochemicals. Allelochemicals contained in extracts had negative impact on seedling vigour of both species but mustard growth was almost fully inhibited while wheat, although less vigorously, continues to grow. Moreover, along with increased extract concentration number of roots per wheat seedling increased. At autotrophic growth stage, differences between these two species became less evident but still wheat appears to be more tolerant to allelopathy stress especially in processes related to plant water status.

REFERENCES

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