

PHYSICAL PROPERTIES AND SOME CHEMICAL CONSTITUENTS OF AQUEOUS EXTRACTS OF SUNFLOWER *cvs.* LECH AND OGRODOWY

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Sunflower (*Helianthus annuus* L.) in our earlier studies showed effective weeds suppression and strong inhibitory effects on physiological processes of test plants (Gawroński et al., 2002, Ciarka et al., 2002, Bernat et al., 2004).

The aims of this study was to: (1) characterize physical properties of sunflower aqueous extract, (2) determine the effect of temperature and length of storage on allelopathic activity of aqueous extract and (3) detect of phenolic compounds: gallic, chlorogenic, caffeic acids, catechin and epicatechin in regard to sunflower cultivar and plant organs.

Air-dried leaf blades, petioles, stem, and inflorescence of sunflower *cvs.* Lech and/or Ogradowy were used. Aqueous extracts of leaves of both *cvs.* were used for measurements of: pH, electrical conductivity, osmotic potential, viscosity and osmotic pressure.

Allelopathic activity of aqueous extracts of sunflower *cv.* Ogradowy after storage on lab bench (~25°C), in refrigerator (2-6°C) and in deep freezer (-30 and – 80 °C) for up to 90 days was evaluated using germinating test.

Analysis of phenols in sunflower leaves, stems, petioles and inflorescence of Lech and Ogradowy *cvs.* was performed using HPLC, System Breeze 1525 Waters.

Results showed that none of the measured physical parameters of the aqueous extracts of sunflower could be responsible for very strong inhibitory effects on studied physiological processes, manifested in our earlier studies. This supports our working hypothesis that allelopathy stress generated by sunflower is of chemical toxic nature. Allelopathic activity of the extracts was very slightly reduced by storing at room temperature, while lower and minus temperatures and the length of storage had no effect, what suggests that sunflower allelochemicals are relatively stable.

All analysed phenols were detected in all plant organs of both *cvs* but their concentrations substantially differed between organs and cultivars. Among analysed compound highest concentration was recorded for chlorogenic acid in leaves (28,45 mg g⁻¹ DM), lowest for epicatechin in stem (0,005 mg g⁻¹ DM).

References

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