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Meeting abstract

The effect of UV light on division capacity of *Helianthus mollis* L. protoplasts

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Cultivated sunflower (*Helianthus annuus* L.), together with soybean, oil seed rape and peanut is one of the four most important crops for oil production and has a cultivated area that range from Russia, Eastern and Central Europe to Central America.

Wild sunflower species served as genetic base for the modern sunflower. Cultivated sunflower was selected from a very narrow genetic base. Enlarging the genetic base will allow it to be better adapted to environmental conditions. Many wild species are used to introduce useful traits, such as disease resistance (*Phomopsis* stem cancer, *Sclerotinia* wilt), cytoplasmic male sterility and increased oil content to the cultivated crop by introgression. Sexual hybridisation is limited in most cases to cultivars within a species or at best to a few wild species closely related to a cultivated crop. Species barrier thereby limits the genetic improvement by classic breeding. Somatic hybridisation, or somatic cell fusion technique, leading to the formation of viable cell hybrids is one of the methods used to overcome sexual incompatibility. In order to eliminate the unfavourable wild species traits in the somatic hybrids, a number of back crossings to the cultivated sunflower would be necessary. A method to reduce the backcrossings by reducing the amount of DNA from wild species in the hybrids, is the asymmetric fusion of the protoplasts. This technique is used to introduce fragments of the nuclear genome from the wild species into the complete genome of cultivated ones. A fragmentation of the donor genome can be induced by UV irradiation of the donor protoplasts prior to protoplast fusion.

The effect of UV-light treatment was determined on the basis of *Helianthus mollis* protoplast viability and division capacity. The isolation and purificartion of protoplasts was according to Krasnyanski and Menczel [1] protocol. The suspension of purified protoplasts was placed under a UV lamp during 60 min (wavelength of UV irradiation was 254 nm). Irradiation intensity was 2 Mmol m^{-2} s^{-1}. Protoplast viability was determined every 5 min, on 100 protoplasts, using FDA, under fluorescent microscope. The protoplasts were cultured in agarose droplets in VKM media. Plating efficiency (the number of cells dividing of total number of cells) was determined at 4 and 8 days in culture.

We observed the UV irradiation affects both, viability and division capacity of *H. mollis* protoplasts. Efficiency of UV-light treatment depends on its intensity and duration, a treatment in our conditions of more than 10 min decreases significantly the viability of the tested cells.

References

1. Krasnyanski S, Menczel L: **Production of fertile somatic hybrid plants of sunflower and *Helianthus giganteus* L. by protoplast fusion.** *Plant Cell Rep* 1995, **14:**232-235.