



# **PROCEEDINGS OF INTERNATIONAL CONGRESS ON OIL AND PROTEIN CROPS**

**2-4 NOVEMBER, 2023**

**ANTALYA, TURKEY**

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INTERNATIONAL  
CONGRESS ON OIL AND  
PROTEIN CROPS**

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**Organized by  
Trakya University  
European Association for Research on Plant  
Breeding (EUCARPIA)  
International Researchers Association**

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## WELCOME NOTES

International Congress Oil and Protein Crops Section Conference of EUCARPIA which is organized by Trakya University and the International Researchers Association in cooperation with the European Association for Research on Plant Breeding (EUCARPIA). The congress is held in Megasaray Westbeach Hotel, Antalya, Turkey, on November 2-4, 2023 with supporting of several national and international partners.

The Congress topics covers Oil and Protein Crops: Plant Breeding and Genetics, Molecular Genetics and Biotechnology, Biology and Physiology, Genetic Resources, Plant Protection, Agronomy, Economy, Animal feeding, Food Science and Nutrients, Fats, lipids, and Protein studies.

Oil crops are rich sources of oils, proteins, minerals, vitamins, and dietary fibers for both human and animal feeding and provide the raw material for the production of biodiesel. Oil crops are soybean, cottonseed, sunflower, canola, rapeseed, peanut, safflower, flax, sesame, coconut, castor, copra, etc.

Almost 50% of the global food protein supply comes from cereal seeds. Soybean, peanut, common bean, pea, lupine, chickpea, faba bean, lentil, grass pea, cowpea, pigeon pea, etc. are currently the most important legumes for human consumption and animal feed. Because of the protein content of their seeds; grain legumes, cereals, and other minor crops such as amaranth, quinoa, hemp, caraway, etc. are protein crops growing for plant protein for food and feed.

The Congress is intended that the subjects to be kept broad in order to provide opportunity to the science and research community to present their works as oral or poster presentations. The Congress languages is in English. Researchers, breeders and others with an interest in the genetics and breeding of oil and protein crops are invited to participate. Among the topics to be discussed are directions of breeding for resistance to abiotic and biotic stresses, improved industrial use, and conventional versus organic production.

As there have been many different scientific meetings around the world, we aimed to bring three different communities together, namely science, research and private investment groups considering practical information sharing that is of value for breeders, seed enterprises, researchers and scientists, in a friendly environment of Antalya, Turkey to share their knowledge and experience and benefit from each other.

There are 38 orals and 63 poster presentation in the congress both joining and presenting normal and online with 141 participants from 20 different countries from the world.

The congress gathered scientists from around the world, and present their recent achievements. The organizers will also invite relevant stakeholders to provide a view on the current situation around the world as well as prospects to overcome the limitation for sustainable crop production to feed the world.

We would like to thank all of you for joining this conference and we would like to give also special thanks to our sponsors and collaborators for giving us a big support to organize this event.

Prof Dr Yalcin KAYA  
Head of the Organizing Committee

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## EXPANDING GENETIC VARIABILITY AND TRAIT IMPROVEMENT OF STAPLE CROPS: INSIGHTS FROM IFVCNS SUNFLOWER, WHEAT AND BRASSICAS PROGRAMS

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### ABSTRACT

Induced mutations are useful tool to broaden the genetic diversity of crops. By using this meticulously orchestrated process, the intention is to harness induced genetic variability to identify and develop new crop varieties that exhibit improved and desirable traits and that are better adapted to changing climate. Within framework of previous IAEA projects, fifteen superior IFVCNS sunflower genotypes, were exposed to gamma rays, fast neutrons, and EMS, altering seedling height. Damage indices (D50 and D30) were calculated for each genotype. Bulk irradiation targeting 30-50% growth reduction will be applied, followed by M1 field cultivation. Promising mutants, that are currently in M6 stage, are currently undergoing selection based on traits like early flowering, reduced stature, leaf and head changes, branching, head angle, sterility, and oil yield. This controlled evolution aims to develop new improved sunflower varieties. Through the activities of the project RER5024, supported by IAEA, mutation breeding is introduced into IFVCNS wheat and barley improvement programs by production and exploitation of three mutant populations. Two wheat and one barley cultivar, all of them widely spread in the production, were exposed to different doses of the gamma irradiation and mutant populations were obtained. The populations are sown in the field trials and first cycle of selection was performed. The chosen mutants will be phenotyped and genotyped in order to select the best possible candidates for new and improved small grains cultivars. Based on previous experiences, further research plans will include mutations of the species of the Brassicaceae family. The aim of this activity will be to alter traits compared to the parental genotype including oil content, quality, protein composition, metabolites, disease and parasite resistance, herbicide resistance, and tolerance to abiotic stress, especially soil salinity. By working on different mutation breeding programs, and through activities of its Centre of Excellence for innovations in Breeding of Climate-Resilient Crops – Climate Crops, IFVCNS aims to accelerate creation of the new crop varieties and more efficiently respond to changing climate, thus ensuring sustainability of agricultural production in Serbia and the region.

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Innovations in Breeding of Climate-Resilient Crops - Climate Crops, Institute of Field and Vegetable Crops, Novi Sad, Serbia

**Key words:** Induced mutations, breeding, Climate Crops