



**PROCEEDINGS OF
5TH INTERNATIONAL SYMPOSIUM
ON BROOMRAPE IN SUNFLOWER**

1-3 NOVEMBER, 2023

ANTALYA, TURKEY

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**Organized by
Trakya University
International Sunflower Association
International Researchers Association**

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WELCOME NOTES

The parasitic angiosperm broomrape (*Orobanche cumana* Wallr) causes economic damage in sunflower production in a number of countries around the world, but especially in Central and Eastern Europe, Spain, Turkey, Israel, Iran, Kazakhstan, and China. For almost a century, there has been a constant tug-of-war between sunflower breeders and *Orobanche cumana*, with frequent changes in which side has the upper hand. Almost as soon as the breeders find a source of resistance to the latest race of the pathogen, broomrape responds by evolving into another virulent race. The development of resistant cultivars as well as optimized managing strategies is a high priority in controlling this parasite, over the world.

This is the 5th specific symposium on broomrape in sunflower, after those held in Turkey in 2008, Moldova in 2011, Spain in 2014 and Romania, in 2018.

The symposium is organized by Trakya University and International Researchers Association in cooperation with the International Sunflower Association (ISA). The symposium will be held in Megasaray Westbeach Hotel, Antalya, Turkey, on November 1-3, 2023. The symposium covers all aspects related to broomrape parasitisms in sunflower, including parasite biology, physiology, parasite-host interaction, the racial status of broomrape, genetic resistance, molecular breeding, chemical control using herbicide-tolerant, and integrated management.

The symposium gathered sunflower scientists from around the world, and present their recent achievements. The organizers also invited relevant stakeholders to provide a view on the broomrape situation around the world as well as prospects to overcome the limitation for sunflower production, imposed by this parasitic weed.

There are 18 oral presentations and 8 poster presentations. There will be 146 participants from 18 countries from 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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Dr Mehmet DEMİRCİ	IRSA, TURKEY

INVITED SPEAKERS

Dr Leonardo VELASCO	Broomprae resistance from wild species
Dr. Dragana MILADINOVIĆ	Broomprae resistance utilizing genomic tools
Dr Mehmet DEMİRCİ	CLEARFIELD control Broomrape and weeds.

EDITOR OF THE PROCEEDINGS ABSTRACT BOOK

Prof Dr Yalcin KAYA, Assoc Prof Dr Necmi BESER

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IN THE RACE WITH THE BROOMRAPE - IS THERE A WINNER?

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ABSTRACT

Broomrape (*Orobanche* spp.) is a widespread, herbaceous, parasitic plant that has been known to attack various host plants, including sunflower (*Helianthus annuus* L.). It is native to regions in Europe and Asia, and it co-evolved with various host plants and with the expansion of agriculture and the movement of crops around the world, broomrape was unintentionally transported to new areas. Newer studies reports about sunflower broomrape detection in African countries such as Tunisia and Morocco. After the discovery of broomrape infestations on sunflower, various control and management strategies have been developed to combat its spread which includes crop rotation, use of resistant sunflower genotypes, herbicide use and other cultural practices aimed at reducing the prevalence of broomrape. Since it appearance on sunflower in the beginning of the 20th Century and development of resistant sunflower varieties, broomrape control was mostly focused on using resistant genotypes with monogenic inheritance. With the expansion of resistant sunflower genotypes in the production, existential pressure on broomrape led to the emergence of more virulent physiological races. Broomrape races are designated with letters, from A to H, and until the middle of 1990s broomrape race E was predominant in the most countries where broomrape was present and was successfully controlled by resistant gene *Or5*. However, studies from the last several years indicate dissimilarities between broomrape populations with the same letter (above race E) reported in different countries. Newer molecular studies are focused on detecting quantitative trait loci (QTLs) which may act at different development stages of broomrape, providing accumulative resistance mechanisms in order to ensure more durable protection. Despite efforts to control broomrape, it remains a persistent problem in sunflower cultivation in certain regions. New strains of broomrape may emerge, making control measures an ongoing challenge for breeders

and farmers. Research and development efforts are ongoing to find more effective and sustainable ways to manage this parasitic plant and protect sunflower crop.

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Key words: sunflower, broomrape races, quantitative trait loci