



**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

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

## EDITOR OF THE PROCEEDINGS ABSTRACT BOOK

Prof Dr Yalcin KAYA, Assoc Prof Dr Necmi BESER

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## NEW APPROACHES FOR ACHIEVING DURABLE RESISTANCE TO BROOMRAPE IN SUNFLOWER

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### ABSTRACT

Sunflower broomrape (*Orobanche cumana* Wallr.) is a holoparasitic plant that causes significant yield losses to sunflower crops. Hence, the development of broomrape-resistant hybrids is one of the prime breeding objectives. Using conventional plant breeding methods, resistance genes have been identified which led to the development of a number of resistant hybrids, adapted to different growing regions worldwide. However, while there are many studies on genetic of resistance to broomrape in sunflower, the molecular tools that are available for research on *O. cumana* are very scarce. Recent advances in sunflower genomics paved the way for application of modern breeding tools in broomrape breeding and find durable solutions for limiting broomrape spread and virulence. Here we present an overview of those new tools, such as phenotyping, -omics, and genome editing techniques, which need to be introduced into the sunflower breeding programs in order to achieve durable resistance to this parasitic plant.

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**Key words:** sunflower, broomrape, new breeding tools, durable resistance