

Institute for Plant Protection and Environment

MOLECULAR STUDIES ON *OROBANCHE CUMANA*
IN SERBIA

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INTRODUCTION

- *Orobanche spp.* are obligate, holoparasitic angiosperms that live attached to the roots of a host plant
- Parasitization by *Orobanche* is mediated by host derived chemical signals that control parasite seed germination and haustorium initiation
- Sunflower broomrape (*Orobanche cumana* Walr.) is a parasitic plant that infects sunflower (*Helianthus annuus* L.) plants
- *O. cumana* successfully competes for sunflower nutritional resources, thereby damaging crop development and reducing yields drastically, by up to 50%

- Resistant hybrids and cultivars were developed against different races of *O. cumana* and these resistant sunflower cultivars were used widely in sunflower production
- Resistance of sunflower to *O. cumana* involved several mechanisms which are interrupting broomrape development at different stages
- The development of new and more virulent races of *O. cumana* imposed need for analyze their genetic variability



MATERIAL AND METHODS

- Seeds of broomrape (*Orobanche cumana* Wallr.) were collected from infested sunflower fields in the region of Vršac, Subotica and Kula in North Serbia and Negotin in East Serbia
- Ten population with total of 300 plants, 30 plants per population, were analyzed

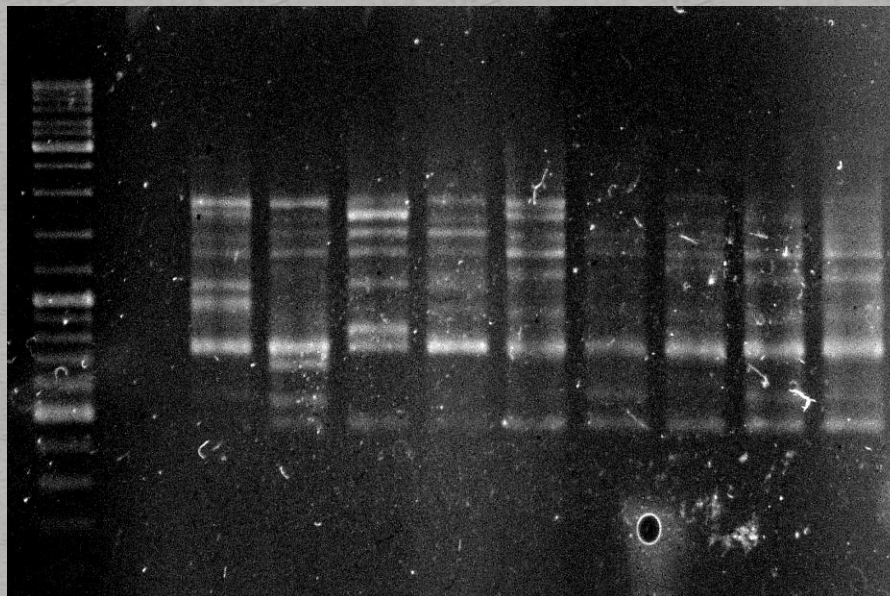
DNA extraction and amplification

- DNA extraction was performed from seeds using standard Plant Dneasy Mini Kit
- The Polymerase Chain Reaction (PCR) was performed using Random Amplified Polymorphic DNA (RAPD) and Direct Amplification of Minisatellite – region DNA (DAMD) markers

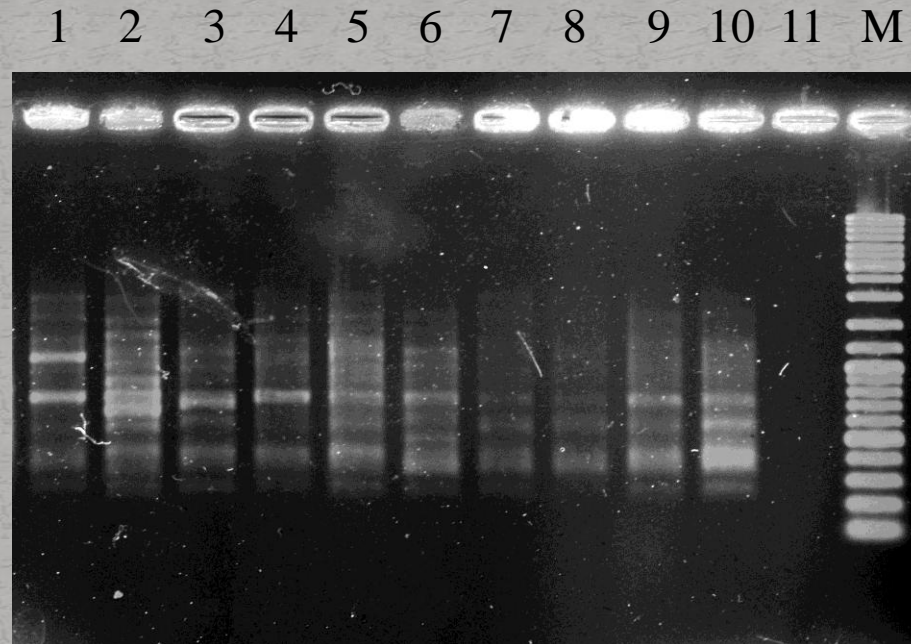
RESULTS AND DISCUSSION

- RAPD analysis has detected low genetic differentiation among populations and no variation among individual broomrape plants within a population
- RAPD technique was performed with two primers OPA 1 and OPA 2 profile

M 1 2 3 4 5 6 7 8 9 10



- Genetic variability among *O. cumana* populations investigated using DAMD technique confirmed variation between the populations from different regions
- DAMD technique was performed with one primer (GACAC)₃



- Using RAPD and DAMD analyzes enable as to detect specific genetic patterns for the samples with different geographic origin in Serbia and showed existence of diverse populations of *O. cumana* in Serbia
- This difference seems to be a result of the geographical origin of the populations, since the regions of the cultivation are borderland
- With regard to intraspecific variation among the population studied, no individual polymorphism was detected within each population

THANKS FOR YOUR ATTENTION