

# Studies on CWR at the Institute of Plant Genetics

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The IGV has headquarters in Bari and four research units



The Institute of Plant Genetics (IGV) holds collections of wild plants belonging, among others, to the genera *Beta*, *Lens*, *Aegilops*, *Brassica*, *Cynara*, *Lycopersicon*, *Solanum*, and species related to *Citrus* and fodder crops

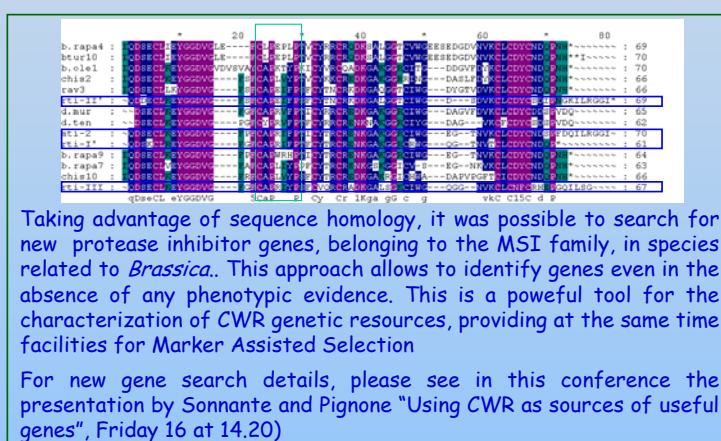
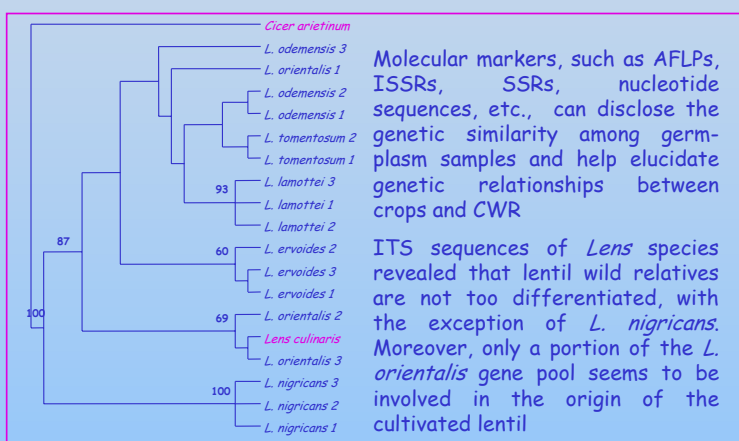
These collections have been gathered by ways of collecting missions carried on all over the Mediterranean basin and by exchange with other institutions

The activity on crop wild relatives (CWR) has progressively increased since the early 1990's, as CWR are considered a good source of new desirable genes and a system to study the establishment and maintenance of natural genetic diversity

Main studies on CWR include:

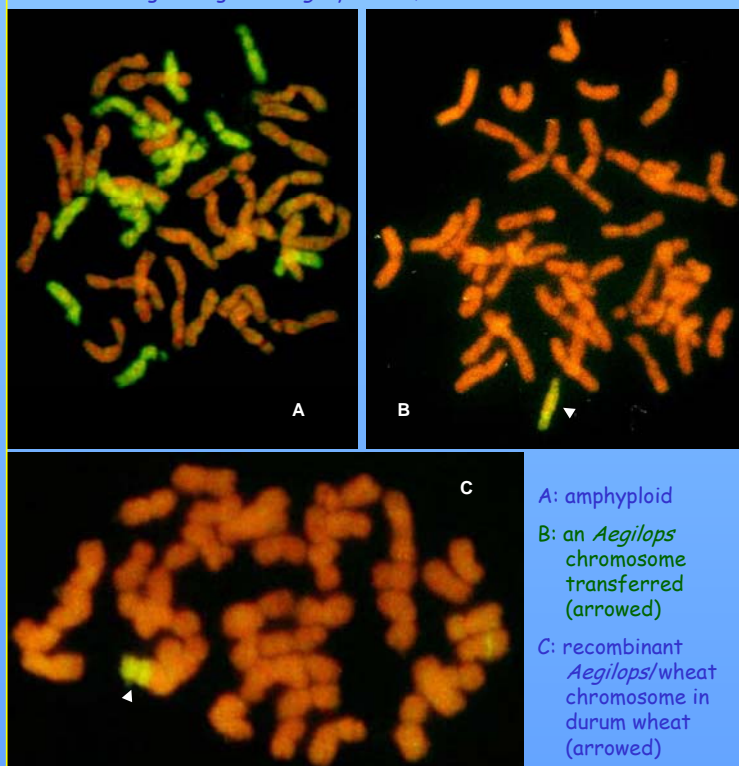
- evaluation of genetic diversity in relation to geographic distribution
- search for new gene sources
- utilization of the CWR genetic resources

The results of some of these studies carried on at the IGV are given below



*Aegilops caudata* was used as a source of genetic resistance to powdery mildew by ways of interspecific crosses to *durum* wheat in the presence of *Ph* genes, which increase homoeologous chromosome pairing (After Simeone *et al* 2001 modified)

GISH images: in green *Aegilops* DNA, in red wheat DNA



CWR are a source of highly useful genes that can be transferred to crops using interspecific hybridization and molecular markers to assist selection of the recombinant genotypes

The IGV is actively involved in transferring genes from CWR to crops also through collaboration with breeders of other institutions. Examples are given for potato and wheat breeding

Useful genes in potato introduced from wild *Solanum* species and mapped on an RFLP map

After Carputo *et al.* 2002 (modified)

Character	No. of mapped genes	Wild species
Virus resistance		
PVX	3	acl, adg, phu
PVY	2	adg, sto
PVA	1	adg
Nematodes resistance		
<i>Globodera rostochiensis</i>	7	adg, spg, ver
<i>Globodera pallida</i>	4	spg, ver
<i>Meloidogyne chitwoodii</i>	1	blb
Bacteria resistance		
<i>Erwinia carotovora</i>	13	chc, yun
Fungi resistance		
<i>Phytophthora infestans</i>	8	ber, blb, dem, pin
Insect resistance		
<i>Leptinotarsa decemlineata</i>	10	ber
Tuber characters		
Dormancy	5	ber
Glycoalkaloids content	7	ber, chc

acl = *S. acaule*; adg = *S. andigena*; ber = *S. berthaultii*; blb = *S. bulbocastanum*; chc = *S. chacoense*; dem = *S. demissum*; phu = *S. phureja*; pin = *S. pinnatosectum*; spg = *S. spegazzinii*; sto = *S. stoloniferum*; ver = *S. vernei*

The new millennium challenge is the enhancement of genes present in gene banks, which are not to be considered museums but a resource for the whole humankind