

CONSERVATION AND EXPLOITATION OF WOODY PLANT GENETIC RESOURCES AT THE CNR/IVALSA INSTITUTE OF FLORENCE

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Summary

A wide publishing and scientific activity is ongoing at the CNR/IVALSA, Istituto per la Valorizzazione del Legno e delle Specie Arboree, aimed to the recovery, characterization, selection, conservation, propagation and exploitation of woody plant germplasm. Over 2,000 accessions of fruit species are preserved in clonal collection, many of which are morphologically and phenotypically described in data banks (both in catalogues, and in Internet). Many research lines (i.e., molecular characterization, *in vivo* and *in vitro* propagation, cryopreservation, nutraceutical production) are carried out, aimed to improve the exploitation of woody plant genetic resources.

Keywords

Biodiversity, germplasm, clonal collections, propagation, woody species

Germplasm preservation and characterization

Part of the work done at the IVALSA/Istituto per la Valorizzazione del Legno e delle Specie Arboree (*Trees and Timber Institute*) of Florence, belonging to the National Research Council (CNR), is devoted to the recovery, characterization, propagation and conservation of woody plant genetic resources. Moreover, a series of research lines is being followed with the aim of exploiting and diversifying their products (fruits, timber, secondary metabolites).

The Institute contributes to the *ex situ* preservation of fruit species germplasm by means of its clonal collections, which have been established and are continuously kept up-to-date at the Experimental Farm “S. Paolina” at Follonica (Grosseto), Italy. Here, about 60 hectares of clonal orchards are devoted to the preservation of over 2,000 accessions, made up as follows:

- over 1200 of **peach** (*Prunus persica*), from North America (600), Italy (330) and other European countries (130), South Africa (25), Asia, Oceania and South America;
- 280 of **plum** (*Prunus domestica*, *Prunus salicina*), from USA (90), Italy (35) and other countries;
- 60 of **persimmon** (*Diospyros kaki*), from Japan and China;
- 270 of **pear** (*Pyrus communis*), from Italy (75), USA (35) and other countries;
- 50 of **quince** (*Cydonia oblonga*), from Italy, USA (2) and other countries;
- 40 of **cherry** (*Prunus avium*), from Italy (36) and other countries;
- 229 of Italian **olive** (*Olea europaea*) cultivars, mainly from Tuscany (145), Liguria (12) and Apulia (18).

In addition to making a contribution to the preservation of fruit plant biodiversity, this germplasm is an important source of material for the genetic improvement and the selection of new genotypes. Furthermore, two experimental lots have been established recently, where olive and pear genotypes are grown and evaluated for valuable timber production.

All the accessions in the collection are morphologically and phenologically described. Moreover, molecular markers are used in order to investigate inter- and intra-variety genetic variability, especially in olive. All the information is collected in data banks, which are available for consultation both in catalogues, and in Internet (<http://www.ivalsa.cnr.it/>). In this field, significant publishing work has been done with regard to olive [1, 2] and cherry [3]. The continuous revision of the data banks also makes an important contribution to the knowledge and preservation of ancient, autochthonous and obsolete woody plant genetic resources.

Propagation, cryopreservation and exploitation of genetic resources

As regards the scientific activity carried out at the IVALSA Institute, numerous research lines aim towards the better exploitation of woody plant germplasm. The main areas of activity concern:

- the *in vivo* and *in vitro* propagation of plant, with studies focused on (i) the identification of rooting markers, (ii) the development and optimization of micropropagation protocols, (iii) the investigation of the in-field performance of somaclones from tissue culture [4], (iv) the development and histo-anatomical characterization of *in vitro* morphogenetic procedures (organogenesis, somatic embryogenesis). Much work has been done to make available and to diffuse information in this area, especially with regard to olive [5];
- the development of new cryogenic technologies for the long-term preservation of germplasm [6];
- the characterization and exploitation of germplasm for the production of nutraceuticals; at present, the main research activities in this area concern olive and cherry.

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