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APPLICATION OF TISSUE CULTURE TO THE GERMPLASM CONSERVATION OF TEMPERATE BROAD-LEAF TREES

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Chapter 28

In Vitro Conservation and Cryopreservation of Ornamental Plants

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Abstract

Today, the conservation of ornamental germplasm can take advantage of innovative techniques which allow preservation in vitro (slow growth storage) or in liquid nitrogen (cryopreservation) of plant material. Slow growth storage refers to the techniques enabling the in vitro conservation of shoot cultures in aseptic conditions by reducing markedly the frequency of periodic subculturing, without affecting the viability and regrowth of shoot cultures. Cryopreservation refers to the storage of explants from tissue culture at ultra-low temperature (−196°C). At such temperature, all the biological reactions within the cells are hampered, hence the technique makes available the storage of plant material for theoretically unlimited periods of time. An exhaustive review of papers dealing with the slow growth storage and the cryopreservation of ornamental species is reported here. Step-by-step protocols for the slow growth storage of rose germplasm, the production of synthetic seeds for the in vitro conservation of ornamentals, and the cryopreservation of *Chrysanthemum morifolium* are included.

Key words: Cryopreservation, In vitro conservation, Liquid nitrogen, Slow growth storage, Synthetic seeds

1. Introduction

The earliest recorded evidence of plant cultivation for ornamental purposes dates back to about 1500 B.C., when lotus ponds surrounded by acacias and palms were depicted in the tomb paintings of Egyptians. "Paradise gardens" and "Gardens of Babylon", among others, were early examples of magnificent gardens. The Italian villa gardens of the early Renaissance, the French parterres of the sixteenth century, and the English landscape gardens of the eighteenth century were important moments of diffusion and success of ornamentals in Europe. From the nineteenth century,

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