

Cryopreservation

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Introduction

Cryopreservation is a method of storing living plant material in liquid nitrogen at nearly -200°C . With this technic its possible to conserve thousands of different plants in small facilities and for very long terms in an environment protected from pathogens and other influences.

Method

For our practice we used the method of encapsulating fresh apple meristems from precooled shoot tips. Common other methods for cryopreserve apples are dormant buds because apple trees built frost resistant buds in fall to weather the cold winter.

Results

Of 15 encapsulatet meristems we got only 4 green meristems who had survived the procedure of freezing. This is a success rate of 27%. In other experiments with encapsulation normally a success rate of 80 % is common. The reason for this significant difference is not clear. It could be that we work not clean enough because there where some meristems with funghi contamination. Working in clean room conditions was very new for us and so we probably made some mechanical mistakes.



Picture1: Preparing shoot tip s from apple ; liquid nitrogene for freezing ; fresh capsules with meristems inside

Discussion

Cryopreservation is a good method with many advantages but there are also some problems. There is no assurance that the preserved meristems are completely free from bacterias and viruses. If they are healty and survive the process you don't know till you defrost and bring them back in vitro. Expensive high tech material is needed and the different labs sometimes have a big problem with protocol transfer. Our practice was a very useful experience.



Picture2: Photo of a green meristem after 3 weeks in liquid nitrogene

Resources

Plant Cryopreservation : a practical guide / ed.: Barbara B. Reed. - New York : Springer, 2008. [005418269]

In vitro culture of higher plants / by R.L.M. Pierik. - Dordrecht: Kluwer Academic Publishers, 1997. [003850501]

Plant tissue culture, development, and biotechnology / ed. by Robert N. Trigiano [et al.]. - Boca Raton, FL CRC Press, 2011. [006240636]

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