Underpinning the development of seaweed biotechnology: Cryopreservation of brown algae (*Saccharina latissima*) gametophytes

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Kelp (i.e. *Saccharina latissima*) is an economically important species and natural populations provide diverse and productive habitats as well as important ecosystem services. For seaweed aquaculture, to be a successful newly emerging industry in Europe and other Western countries, it will have to develop sustainable production management strategies. A key step in this process is the capacity to conserve genetic diversity for both breeding programs as seed-stock for onward cultivation and in the management of wild populations as potentially interesting genetic resources might be disappearing.

In this study, the cryopreservation of male and female gametophytes of *S. latissima* by four two-step cooling methods and four cryoprotectants were tested. We report here that cryopreservation constitutes an attractive option with viable cells in all treatment combinations. The highest viabilities for both male and female were found using controlled rate cooling methods combined with DMSO 10% (v/v). Morphological normal sporophytes have been observed to develop from preserved vegetative gametophytic cells, independent of treatment. This indicates that cryopreservation is a successful preservation method for male and female *S. latissima* gametophytes.

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