Cryopreservation of rainbow trout sperm and eggs

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To cite this version:

Gérard Maisse. Cryopreservation of rainbow trout sperm and eggs. Marine Biotechnology, CRITT Biotechnologies, Chimie fine et Environnement., Aug 1992, Rennes, France. hal-02775224

HAL Id: hal-02775224
https://hal.inrae.fr/hal-02775224
Submitted on 4 Jun 2020

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MARINE BIOTECHNOLOGY
12th - 13th August, 1992
Rennes - Brittany

_Pholas dactylus_: a bioluminescent marine bivalve mollusc.
This workshop was organised by CRITT Biotechnologies, Chimie fine et Environnement and was supported by COMETT AUEF Bretagne and the Regional Council of Brittany.
CRYOPRESERVATION OF RAINBOW TROUT SPERM AND EGGS

The freezing of reared-fish gametes has a double interest: this is a tool necessary for the diffusion of genetic advance and the freezing of eggs would allow a staggering of the production, which is especially difficult for species which spawn once a year.

Few works have been carried out on fish-egg cryopreservation and scientists have not gone beyond the preliminary study.

The tests have shown that the rainbow trout eggs resistance to cold (-10°C) can be improved with propanediol (20 %) for the "epiboly" and "eyed" development stages with a cooling rate of 0.1°C/mn.

Many studies on sperm freezing have been made showing a high variability of results. The ability to freezing depends on the sperm membrane quality which varies from one ejaculate to another one. A plasma membrane was isolated, allowing scientists to analyze it and to study its composition variations according to the male feeding and the rearing temperature. The main results are as follow:

1) the external membrane leaflet is more rigid than the internal one
2) the membrane fluidity does not adapt to temperature (from 4°C to 24°C)
3) the membrane lipid composition can be modified by the food and the rearing temperature
4) the fitness for cryopreservation is higher when the spermatogenesis has been made at 18°C, compared with 8°C, which could be linked to a lower cholesterol/proteins ratio, a higher quantity of 18:0 or a lower monoinsaturated fatty acids ratio.