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Influence of Cooling Rate, Developmental Stage and Addition of Sugar on Cryopreservation of Pearl Oyster (*Pinctada Fucata Martensii*) Larvae

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This study was conducted to investigate cryopreservation of pearl oyster, *Pinctada fucata martensii* larvae. Four cooling rates (-0.25, -0.5, -0.75 and -1.0℃ /min.) were used to examine a proper cooling rate during cryopreservation of trochophores before seeding temperature (-12℃). Seven developmental stages (early and late trochophores, early and late D-shaped larvae and early, middle and late umbo stage larvae) and different sugars (fructose, glucose and sucrose) were used to investigate optimal larval stage and effective sugar in cryopreservation of larvae.

The survival rates of frozen-thawed trochophores increased at cooling rate of -1.0℃/min. As larval developing, survival rate of frozen-thawed larvae increased, except umbo stage larvae, and especially late D-shaped larvae highly survived as 91%. Addition of sugar revealed positive effect on cryopreservation in this experiment and 0.2 M glucose and sucrose mixed with 2.0 M dimethyl sulfoxide significantly enhanced survival rate of larvae ($P<0.05$).

The results of our study indicate that desirable cooling rate, developmental stages of larvae and effective sugar for cryopreservation of pearl oyster, *P. fucata martensii* larvae are -1℃/min, late D-shaped larvae and 0.2 M glucose and sucrose, respectively.

Keywords) ***Pearl oyster, Pinctada fucata martensii, cooling rate, developmental stage, sugar***