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Cryopreservation of the sperm of the African giant catfish for the thriving aquaculture industry in Nigeria

Ofelia G Omitogun[1], O O Ilori[1], O O Olaniyan[2], P Amupitan[2], T J Oresanya[2] and **S Aladele[3]**
[1]Elizade University, Nigeria
[2]Obafemi Awolowo University, Nigeria
[3]National Centre for Genetic Resources and Biotechnology, Nigeria

Nigeria is the top Sub-Saharan country in catfish production by aquaculture. However, male brood stock is killed to obtain sperm cells used for artificial induced spawning of catfish. In this research paper, the ability of the African giant catfish (Clarias gariepinus Burchell 1822) semen cryopreserved from 4-8 months with different combinations of extender and cryoprotecting agents, dimethylsulphoxide (DMSO) and glycerol with two extenders: GFR (Ginzburg fish ringer) and PBS (Phosphate buffer saline) to fertilize various egg clutch weights were investigated to evaluate the optimum clutch of egg a milliliter of cryopreserved semen can fertilize. DMSO + glucose with PBS and DMSO + PBS only proved to be the best cryoprotectant-extender combination in maintaining viability of catfish semen. From this study it can be concluded that at further dilution of semen together with different cryopotecting agents, viability of the semen is still maintained but it varies depending on the type of cryoprotecting agents used. DMSO-dimethylsulphoxide proved to be more efficient than other cryopreservatives in preserving sperm viability. Its potential in cryopreservation can be increased when used in combination with a 5% glucose solution, i.e. DGP and DP proved to be the best even for both trials. Also, viability of African catfish *C. garieprinus* semen cryopreserved in liquid nitrogen can be maintained for a relatively long time provided ideal protocols are strictly followed. From economic feasibility perspective of cryopreservation of catfish semen, cryopreserved semen is economically feasible and profitable for the cryobank institute or company. The farmers are also assured of the viability of the sperm cells they are buying. In an effort to assist the subsistence fish farmers in Nigeria who may not be able to obtain the cryopreserved sperm, the viability of sperm preserved under ordinary refrigerated conditions is possible for a short period of time of 2-7 days depending on the amount of extender used. A culture medium like RPMI 1640 used in this study may give longer life span for sperm cells under refrigerated conditions.

aomitog@oauife.edu.ng, ofelia.omitogun@elizadeuniversity.edu.ng

Gonad tissue xenotransplantation a potential aproache to fertility preservation

Paulo Henrique Almeida Campos-Junior
Federal University of São João Del Rei, Brazil

Gonad tissue xenograft is a powerful approach developed in the last decade. In this technique, small fragments of testis or ovarian cortex from different mammalian donor species, are placed subcutaneously under the back skin of an immunodeficient mouse, where they respond to the rodent gonadotropins, initiating and leading to complete spermatogenesis. As expected, this approach became an attractive strategy to recapitulate and study gonad development in non-rodent species and, among several other important applications, could be used to preserve the germplasm of young individuals in which sperm collection is not an option or to preserve the fertility of aged womens. In this scenario, our group have been developed some studies using theses techniques. In relation to the testis xenograft, recently we showed the production of fertile sperm from collared peccary under the back skin os immunodeficient mice. Aditionally we are developing interesting studies aming preserve the female fertility using ovarian cortex tissue xenograft.

paulohenrique@ufsj.edu.br