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A Glance over the Last Decade of Literature about Animal Sperm Banks

Isabel Casas*

Biotechnology of Animal Reproduction (TechnoSperm), Department of Biology, University of Girona, Campus Montilivi, s/n, 17071 Girona, Catalonia, Spain

Commentary

Global population growth threatens the diversity of AnGRs (Animal Genetic Resources), which is critical for livestock and wild animal viability, food safety and rural development. The AnGRs are also fundamental to preserve the natural heritage for the future [1-3]. In this sense, animal sperm banks are tools to secure the genetic diversity [4]. A retrospective analysis of the bibliography in this area was performed to unveil the most recurrent topics in animal sperm bank research in the last decade.

A total of 692 published journal articles that related to the animal (non-human) sperm repositories from 2004 to 2014 were screened using the Pubmed® searching engine. Descriptive statistics were implemented using SPSS® v15.0.1 software after classifying the journal articles according to four different parameters: country, species, research goal, and preservation method.

Results showed that five countries (Australia, Brazil, Japan, Spain and USA) authored the 53.14% of the articles about animal sperm banks that were sampled. Also, the 63% of the articles focused on the domestic species, and certain research topics in these articles were tested more recurrently than others. These were the optimization of the preservation protocol and the test of the sperm viability; these topics accounted 70.58% of the articles in the sample.

Conventional cryopreservation has been the main preservation model adopted in the last ten years (90.08% of publications in the sample). It consists in rapid or slow immersion of sperm in liquid nitrogen before packing sperm into a straw, bag, tube or vial [5,6]. Despite of such predominance, alternative models were also tested for storage of sperm at low temperatures, understanding low temperatures as those below refrigeration (15°C): pellet cryopreservation (equilibrating in dimethylamide for few minutes, and then dropping raw sperm into liquid nitrogen), cryomicroscopy, directional freezing, suspension of sperm in EGTA-Tris-HCl buffered solution, unique freezing technology, storage in ultra-freezer at -80°C or -150°C, freezing without cryoprotectant or using special freezing device, drying (freeze-drying, evaporative /convective /heat /vacuum drying, and spin drying), cooling (4-5°C) and vitrification (freezing at high cryoprotectant concentrations) [7-10].

The contribution of new and more optimized techniques to the conservation of AnGRs would not be possible without the establishment of global consortiums and collaborative networks (e.g. the Frozen Zoo, the Frozen Ark Project, Reef Recovery, WAZA, etc.) [11-13], whose main challenge consists in scaling up practices in animal sperm banks to the organizational level of plant and human repositories.

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***Corresponding author:** Isabel Casas, Biotechnology of Animal Reproduction (TechnoSperm), Department of Biology, University of Girona, Campus Montilivi, s/n, 17071 Girona, Catalonia, Spain, Tel: +34 972 41 80 46; E-mail: isabel.casas@hotmail.com

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