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Fertility of females of sturgeon hybrids obtained from species with different levels of ploidy (*Acipenser ruthenus* and *A. dauricus*) and their cloning

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Abstract

Main purpose of this work is the identification of females of artificial sturgeon hybrids capable to produce unreduced oocytes. The importance of this task is due to the ability to receive clonal all-female lines. Experiments were performed on the previously obtained reciprocal hybrids of sterlet, *Acipenser ruthenus* (S) with ~120 chromosomes and kaluga, *Acipenser dauricus* (K) with ~260 chromosomes. Karyotypes of backcross hybrids of (S × K) female (obtained by crossing sterlet female with kaluga male) and sterlet male included 180 – 190 chromosomes. This means that (S × K) female produced eggs with ~125 chromosomes and its karyotype consisted of ~250 chromosomes. This number was confirmed by a comparative analysis of erythrocyte size in this female and species with different ploidy. Karyotype with ~250 chromosomes can occur in (S x K) female only as a result of fertilization of a diploid sterlet egg (120 chromosomes) with kaluga haploid sperm (~130 chromosomes). Eggs of hybrid fertile (S × K) female, inseminated with inactivated sperm of Amur sturgeon and sterlet, developed into viable gynogenetic offspring, confirmed by the analysis of five microsatellite loci in this progeny, (S x K) female, and males used for UV-inactivated sperm. These data allow us to propose a method for obtaining fertile females of sturgeon hybrids from species with different ploidy. For this, experimentally obtained diploidized eggs from diploid 120-chromosome species must be fertilized by 250–270-chromosome male. Karyotypes of backcross hybrids of (K × S) female (obtained by crossing kaluga female with sterlet male) and sterlet male included ~250 chromosomes and hybrids of this female with kaluga male had ~320 chromosomes. These results proved an ability of hybrid (K × S) female to produce unreduced eggs, resulting in triploid backcrosses. The absence of reduction during egg development is well known in clonal forms (species) of vertebrates, which are of hybrid origin, and in artificially created fish hybrids. However, this has not been reported previously for sturgeons. Insemination of eggs of (K × S) female with UV-inactivated sperm of sterlet and Amur sturgeon led to offspring generation for which the genetic identity to their mother was proved using microsatellite analysis. That is, clonal inheritance was observed. These results suggest the possibility of developing a technology to

