

Asexual modes of reproduction are usually based on the principle of copying (cloning) DNA from the female and passing it on to the offspring. For most asexually reproducing vertebrates the progeny develop from an unreduced and often unfertilised egg. This is driven by the mechanisms of parthenogenetic and gynogenetic reproduction. While in the former the clonal germ cell develops spontaneously and separately, in the latter a sexual partner is needed to activate the cleavage of the ovum, although without the fusion of the sperm and egg. Therefore in both cases there is no fertilization and the clonal progeny consist solely of daughters, hence the majority of previous studies have only focused on asexual female lineages. However, on rare occasions asexual clonal males can arise when the right fertilization occurs. Whilst these offspring are usually infertile, fertile diploid asexual males have been discovered in just three genera of hybrid origin in vertebrates. One of these unique cases is the European water frog complex of the genus *Pelophylax*, whose distribution includes the Czech Republic.

In areas around the upper Odra River populations of hybrid males were recently discovered who form stable all-male lineages, similar to those formed by asexual females. The results of this study show that males produce clonal sperm by hybridogenesis when the maternal genome is eliminated from the germ cells. By true fertilization, the recombinant egg from a sexual female is fertilized by a clonal sperm bearing half of the paternal genetic material in the form of a "hemiclone". The hemiclone is passed from generation to generation, and is shared by these hybrid individuals, suggesting that they also share a common ancestor. In the all-male populations males also exist who can simultaneously generate two types of clonal sperm, one carrying the maternal genome and the other the paternal. After mating with the sexual female, the offspring of sexual females arise alongside the hybrid offspring of hemiclonal male descendants. Their potential evolutionary role is also discussed here.

The study of the asexual lineages of hybrid male water frogs is the first step to general understanding of male asexuality, its origin and evolutionary development. The presented work highlights the common and differing features of male and female asexuality, studies the principal of persistence of all-male populations of the genus *Pelophylax* and expands the overall knowledge about the origin and reproductive strategies of vertebrates.