
International Scientists Examine the Complete Genome of Prussian Carp and Its Invasive Abilities

By [Paw Mozter](#) Jul 20, 2022 04:01 PM EDT

One of the fish species that has invaded Europe with the greatest degree of success is the Prussian carp. Its capacity for asexual reproduction offers it a significant edge over other species.

The whole genome of the Prussian carp has now been described for the first time by an international scientific team.

This also helps us comprehend its unusual reproduction strategy much better.

The research, which was headed by Dunja Lamatsch from the University of Innsbruck's Research Department for Limnology, was released in the journal *Nature Communications*.

Invasive fish



(Photo : Adam Rhodes/Unsplash)

An invasive species in Europe is the Prussian carp (*Carassius gibelio*), which is native to Asia. It is a close relative of the goldfish and fights for the same environment as the critically endangered native crucian carp.

The Prussian carp, however, has a significant evolutionary advantage over goldfish and crucian carp in that females may avoid the time-consuming quest for a partner.

Instead, male crucian carps or other carp species' sperm is used by female Prussian carps. They achieve this by mixing with a school of crucian carp, where the males fertilize the eggs they have placed.

The Prussian carp's egg cell is stimulated to divide by the kidnapped sperm. The male's genetic material is then degraded in the egg cell without being used.

This process is known as virgin production or sperm-dependent parthenogenesis. The female clones of the Prussian carp are present in every progeny created in this manner.

Males only sometimes appear in Prussian carp populations, which are consequently completely female.

According to Dunja Lamatsch of the Research Department for Limnology of the University of Innsbruck, located in Mondsee, Austria, monosexual, or exclusively female reproduction allows for quick colonization of new ecosystems and gives invading species a significant advantage over their native rivals. Her research focuses on understanding

The genome, or complete heritable information of an organism, is broken down into many chromosomal groups.

The majority of sexually reproducing animals have a twofold (diploid) pair of chromosomes.

Only one single (haploid) pair of chromosomes are passed on at a time during meiosis, the process by which male and female chromosomes are separated into germ cells for reproduction.

Finally, a diploid creature is created when a haploid egg and haploid sperm fuse.

The Prussian carp contains six pairs of chromosomes, making it hexaploid. The other two were added by crossing with a fish that was closely similar. Four of them were created by crossing unrelated fish species.

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Prussian carp

The silvery-brown Prussian carp closely resembles goldfish in appearance. They have a lifespan of five to ten years and reproduce frequently each year.

They have the ability to reproduce asexually through a process called gynogenesis, which uses the sperm of other fish species in the water column to trigger the development of eggs and create new females that are basically clones of the original.

The native fish species may suffer negative impacts from this interference with reproduction.

Extremely resilient and tolerant to a variety of environmental factors are Prussian carp. This species has been discovered in aquatic habitats that are unsuitable for native fish species due to low oxygen levels and poor water quality.

It can outcompete native species for food and habitat since it is a generalist when it comes to habitat and eating.

It is a prolific intruder and a hazard to the ecological integrity of aquatic environments because of its life-history traits.

Currently, only Alberta and Saskatchewan in North America are home to Prussian Carp. Avoid transporting or releasing live fish into any body of water, and always wash your equipment after using it in the water to help stop the spread of Prussian carp.

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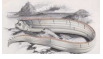
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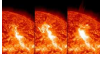
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