

In recent years there is a growing concern about environmental pollution with endocrine-disrupting compounds (EDCs). EDCs are substances that can mimic the action of endogenous hormones - such as estrogen, testosterone, or thyroid ones. They can disturb the hormonal balance, and thus the development and organ functions in animals, including humans. Most of the EDCs in the environment are of anthropogenic origin as a residue of e.g., plastics, personal care products, and drugs. In Europe, including Poland, significant amounts of EDCs are detected in surface waters. Unfortunately, regular monitoring of the presence of many of these compounds in reservoirs, and even in drinking water, is not carried out. There is a need for more research into the presence of EDCs in the environment and the impact they have on living organisms.

Amphibians are a group of animals that is particularly sensitive to endocrine-disrupting compounds. Their first stages of life, embryonic and larval development, take place in the aquatic environment. Amphibian eggshells are permeable to water chemicals, as is the skin of tadpoles and adult individuals. Given the precise developmental changes that occur in amphibians at these stages of life, including the development and differentiation of gonads, contact with EDCs can be harmful to them. Their high sensitivity to EDCs makes them excellent bioindicators of pollution in surface waters. However, surprisingly, there is still little scientific research on this topic.

In our project, we propose that among the features of amphibians that may indicate their contact with EDCs, the digit ratio (DR) may be particularly useful. DR represents the ratio of the length of the second to fourth digit in vertebrate limbs. In many animals, including humans, DR is a strongly sex-related trait. This is because the length of the second and fourth digits during embryonic development is influenced by sex hormones. DR can be very sensitive to any environmental endocrine disruptors and indicate EDCs pollution. The DR pattern in amphibians and its dependence on EDCs have not yet been well studied.

In our project, we plan to investigate the effect of endocrine-disrupting compounds on sex and phenotypical traits, including the digit ratio, in native species of amphibians: the pool frog (*Pelophylax lessonae*) and the common frog (*Rana temporaria*). The selected species have interesting differences in reproductive development and ecological differences that may influence their sensitivity to EDCs contamination.

The project will consist of two experiments, one for each frog species. The impact of 2 endocrine-disrupting compounds, in various concentrations, on the sexual development and DR of amphibians will be tested. Selected compounds include bisphenol A, known to have negative effects on the reproductive system in many species, and ethinylestradiol, a synthetic estrogenic hormone. The concentrations of compounds in the experiment will be adjusted to the levels observed in surface waters in Poland

The results of our project will provide important insights into the EDCs presence in the environment and their impact on endangered amphibian species. The obtained data will help to better understand the DR pattern in species with different ecology and adaptation and to see if it can be a useful tool in controlling EDCs pollution in the environment.