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A clean bill of health for our waters?

Experts concerned about malformations in marine organisms -
Cause study in North and Baltic Seas necessary

The reproductive organs of female eelpout (*Zoarces viviparus*) in the North and Baltic Seas have been damaged, according to tests conducted for the Federal Environmental Specimen Bank (German: *UPB*) by the Institute for Applied Ecology (IFAÖ) on the reproductive organs (gonads) of these seafish. The *UPB* has been collecting thousands of environmental and human samples every year since 1985. The samples are stored and available to scientists for the purpose of carrying out analyses of pollutant contamination. Stored samples of female eelpout allow for drawing representative conclusions about the chemical contamination of this fish prevalent in the coastal waters of the North and Baltic Seas.

The *UPB* has now had the gonads of an annual female eelpout catch tested for changes in tissue. The Rostock-based Institute for Applied Ecology commissioned by the *UPB* came up with worrying results: obviously female gonad cells had formed in the testes of male eelpout. Experts see such malformations as an indicator of contamination with endocrine-active pollutants that interfere with the reproductive system. These so-called endocrine substances can be input to the sea through production and use of industrial chemicals, use of household products, plant protection agents, or pharmaceutical drugs. There has long been indications of feminisation in male fish in the Baltic Sea, and the IFAÖ has now discovered this malformation in female eelpout in the German North Sea.

The Rostock experts also discovered malformations in female eelpout gonads, with massive degeneration apparent in the egg cells in the ovaries weeks before sexual maturity and the onset of the mating season. This phenomenon is known as a non-specific indicator of stress, for chemicals as well as other factors may trigger it. What is new though is the extent of the changes: nearly every female eelpout sampled revealed moderate to severe egg cell degeneration.

What is the impact of these damages to the reproductive organs on the reproductive success of female eelpout? The presence of a few egg cells in male testes is not likely to affect male reproductive ability significantly; however, based on the clear findings, there is reason to believe that female eelpout fertility has been disrupted.

The causes of these degenerative changes have not been conclusively explained at present. The *UPB* is currently taking more samples from female eelpout, also from non-contaminated areas in the North and Baltic Seas. The studies aim to demonstrate whether or not, and to what extent, chemicals are responsible for the gonadal changes, and what other causes may exist.

The *Biologisches Effektmonitoring mit Aalmuttern aus Nord- und Ostsee* [*Biological Effect Monitoring in Female Eelpout in the North and Baltic Seas*] research report can be downloaded from <http://www.umweltbundesamt.de/umweltproben/aktuelles/index.htm>.

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