

PCDD and PCDF detection in sturgeon spawn in the VOLGA river

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A heavy anthropogenic pollution of the Volga river negatively affects biota. A great part of the sturgeons spawning in the lower part of the river are ill and cannot spawn normally. It is of interest to determine the contents of some highly toxic substances such as PCDD/PCDF in fishes to evaluate if they affect the ecosystem of lower Volga. Sturgeons usually live long and have a low rate of toxicants excretion, therefore they are a good object for such evaluations and can be an indicator of river contamination.

We have studied some samples of sturgeon spawn, water and sediments and food for fishes collected at fish stations.

PCDD/PCDF determination was carried out using a GC-HRMS system consisting of a gas chromatograph HP 5890A with fused silica capillary column HB-5 (60 m x 0.25 mm, 0.33 μ m), mass spectrometer Finnigan HS Q 30 and data system SS 300. Temperature was raised from 140 °C (holding 1 min) to 220 °C (10 °C/min) and then to 280 °C (2 °C/min) and holding it at this temperature until all PCDD/PCDF were eluted. ^{13}C -labelled PCDDs were added to the samples. Mass spectra were registered by electron impact ionisation at 70 eV and resolving power of about 6000.

Of the spawn samples studied PCDD and PCDF congeners were found only in a large 5-year old sturgeon with not fertilized spawn. Of 2,3,7,8-substitutes PCDD and PCDF it contained 2,3,7,8-TCDD (18 pg/g of fat), 2,3,4,7,8-PnCDF (16 pg/g), 1,2,3,4,6,7,8-HpCDD (9 pg/g), OCDD (230 pg/g).

Conclusion

The river Volga is contaminated by PCDD and PCDF and further study is needed to estimate contaminated regions and degree of contamination. PCDD/PCDF were not detected in spawn of younger fishes nor in water, sediments and fish food.