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Effects of effluent wastewater in developing zebrafish (*Danio rerio*)

Popular summary

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Popular summary

Whenever you wash your clothes, your dishes or your car, where does all the dirt go? That's right, down the drain into the sewage system and swirls away to your nearest wastewater treatment plant. After the wastewater has been treated it is released into a river or a lake nearby ...but what was really removed from the wastewater?

Swedish wastewater treatment plants receive millions of cubic metres every year that does not only contain bathroom business, but also household chemicals, personal care products, hospital wastewater, run-off from streets and much more. Wastewater treatment plants are designed to remove excess nutrients, as phosphorous and nitrogen, and not so much the chemicals, metals and left-over pharmaceuticals that also pass through the sewage system. Because of this, wastewater effluent is known to be quite polluted which causes a problem for aquatic wildlife and in extension also humans. Possible consequences of this kind of pollution have been seen in the UK where wastewater effluent caused hermaphrodite wild fish.

This study aimed to examine what kind of effects present day Swedish wastewater effluent could cause in wild fish. Effluent from five wastewater treatment plants were sampled and newly fertilized zebrafish eggs were placed in the effluent. Their development was then followed for a duration of six days while examining potential effects in early movements, heartbeat, hatching time and swimming behaviour.

The results of this study gave no clear signs that the development of the zebrafish was negatively affected by the wastewater. This was probably because the levels of pollutants in the water were too low to cause any detectable effects. This study was performed on undiluted wastewater effluent, which in the wild will be diluted many times in the receiving lakes and rivers. It can therefore be concluded that the risk for harm in Swedish wild fish is probably low. However, to further investigate the possible effects of wastewater treatment effluent in the environment, longer studies on effluent wastewater in fish ought to be performed as this study only lasted for six days. Wild fish are living their whole life with this constant input of pollutants via wastewater effluent and six days is not enough to truly mirror the conditions in the wild.