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Enemies of the Environment: Estrogen Mimics, Can They Be Stopped?

Around the world, excess hormones are being introduced into environments below wastewater treatment facilities and are beginning to poison organisms of any spectrum. This project was devised to test if an organic or activated carbon filter would effectively filter out an endocrine-disrupting chemical from water. The problem addressed in this project was whether an organic or activated carbon filter will preserve the survivorship, reproductive biology, appearance, or behavior of Daphnia magma abnormally being affected by trace amounts of 17beta-estrodial. The chemical was diluted until its concentration matched that found in effluent wastewater and then passed through either an organic or activated carbon filter. After baseline data were recorded, the Daphnia were placed into the filtered water, an untreated estrodial treatment, and a tap water control treatment. After three days, the survivorship, heart rate, reproduction rate, appearance, and behavior of the Daphnia were recorded again. The results supported the hypothesis in multiple ways and in some ways, they did not. The organic filter treatment had a healthy population of Daphnia with no affects on surviorship, behavior or heart rate. The birth rate and appearance of the Daphnia in the organic treatment were slightly altered. The activated carbon filter population of Daphnia had not affects of altered appearance or behavior and minor affects on the heart rate, birth rate and survivorship. This research raises questions on whether the wastewater treatment facilities are currently employing the correct technology to eliminate endocrine-disrupting chemicals, if these miniscule levels of chemicals can be completely eliminated and if they are harmful to larger vertebrates like humans.