

Title: Delineating the effects of spironolactone on two small fish species

Authors:

LaLone, CA¹, Villeneuve, DL¹, Kahl, MD¹, Durhan, EJ¹, Makynen, EA¹, Jensen, KM¹, Cavallin, JE², Stevens, KE¹, Severson, MN¹, Berninger, JP³, Skolness, SY⁴, Ankley, GT¹

¹U.S. EPA, Duluth, MN

²ORISE Program, Duluth, MN

³National Research Council, Duluth, MN

⁴University of Minnesota Duluth, Duluth, MN

Abstract:

Spironolactone is a pharmaceutical that acts as an anti-androgen in humans to treat certain conditions such as hirsutism and female pattern hair loss. This drug is also used to treat hypertension, various dermatologic conditions, and as a diuretic. With its common usage for various maladies in humans it is conceivable that this drug could enter the aquatic environment, and was indeed detected downstream of a pharmaceutical manufacturer. To assess unintended effects of this drug to aquatic organisms, 21-d reproduction studies were conducted with two fish species, *Pimephales promelas* (fathead minnow) and *Oryzias latipes* (Japanese medaka). Both species showed significant reductions in fecundity at 50 µg spironolactone/L. The fathead minnow also showed complete cessation of reproduction on day 2 of the exposure at concentrations ≥ 5 µg spironolactone/L. Masculinization of females was observed at 5 µg/L and 0.5 µg/L as evidenced by development of papillary complexes on medaka and tubercle formation on fathead minnows, respectively. These effects occurred at concentrations below those reported in the environment. These results suggest that spironolactone has the potential to act adversely on certain fish species and should be included as a chemical for environmental monitoring. *The contents of this abstract neither constitute nor reflect official US EPA policy.*

Keywords: Spironolactone, fathead minnow, medaka, masculinization

Contact information:

Carlie LaLone; U.S. Environmental Protection Agency

6201 Congdon Blvd.

Duluth, MN, 55804

LaLone.Carlie@epa.gov

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