

EFFECTS OF TWO PROGESTINS, NORETHINDRONE AND LEVONORGESTREL, ON REPRODUCTION IN A MARINE FISH, *Tautogolabrus adspersus*

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Endocrine-active pharmaceuticals that enter the aquatic environment through sewage effluent may have unintended impacts on reproduction in fish, which in turn may affect the sustainability of exposed populations. Laboratory experiments were conducted with the marine fish cunner (*Tautogolabrus adspersus*) to evaluate whether norethindrone (NOR) and levonorgestrel (LNG) affected reproduction in spawning adults. Both progestins are used in human contraceptive formulations and have been detected in low (ng/L) concentrations in aquatic environments. Synthetic progestins in aquatic environments are of special concern because some fish use natural progesterones as pheromones to coordinate reproduction, and evidence suggests progestins may be selectively taken up through the gills in some species. Reproductive endpoints of egg production, viability and fertility were assessed daily in spawning cunner treated with NOR or LNG (nominal concentrations of 0, 0.075 or 0.75 mg/kg) by oral gavage on days 0, 4, 8, 12 and 16 of the experiment. All fish were sacrificed on day 17 and gonadosomatic index (GSI) was determined. In NOR-treated fish, egg production per gram female was significantly reduced relative to controls at both concentrations, while egg fertility and viability was notably decreased, although not significantly, only in the 0.75 mg/kg treatment. GSI was significantly reduced in both males and females from the 0.75 mg/kg treatment. Female mortality in this treatment group was more than twice that in controls, indicating an increase in male aggression. In LNG-treated cunner, no significant effect was seen on egg production, fertility, viability, or GSI compared to control fish. Results indicate some progestins can impact fish reproduction, even in short-term exposures. Research is planned to determine if these fish selectively take up progestins from the aquatic environment. This abstract does not reflect U.S. EPA policy.

Previously reviewed as ORD-002414.