Effects of methyltestosterone, letrozole, triphenyltin and fenarimol on histology of reproductive organs of the copepod Acartia tonsa - DTU Orbit (06/12/2018)

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The marine calanoid copepod Acartia tonsa was exposed to methyltestosterone (MET, 1.6–126μgL−1), letrozole (LET, 10–1000μgL−1), triphenyltin chloride (TPT, 0.0014–0.0088μgL−1 TPT-Sn) and fenarimol (FEN, 2.8–105μgL−1) for 21d covering a full life-cycle. All four compounds investigated are known to act as androgens in vertebrates. The digestive tract, musculature, nervous system, reproductive organs, gonad and accessory sexual glands were examined by light microscopy after routine staining and immune-labelling for detection of apoptosis and determination of proliferation activities. MET induced an inhibition of oogenesis, oocyte maturation and yolk formation, respectively, which was most pronounced at the lowest concentrations tested. In LET exposed males, spermatogenesis was enhanced with very prominent gamete stages; in some stages apoptosis occurred. The spermatophore was hypertrophied and displayed deformations. In females, LET induced a disorder of oogenesis and disturbances in yolk synthesis. TPT stimulated the male reproductive system at 0.0014 and 0.0035μg TPT-SnL−1, whereas inhibiting effects were observed in the female gonad at 0.0088μg TPT-SnL−1. In FEN exposed females proliferation of gametes was reduced and yolk formation showed irregular features at 2.8–105μgL−1. In FEN exposed males an elevated proliferation activity was observed. No pathological alterations in other organ systems, e.g. the digestive tract including the hindgut acting as respiratory organ, the nervous system, or the musculature were seen. This indicates that the effects on gonads might be caused rather by disturbance of endocrine signalling or interference with hormone metabolism than by general toxicity.

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