

# UNRAVELLING THE CAUSES AND CONSEQUENCES OF INTERSEXUALITY IN WILD FISH

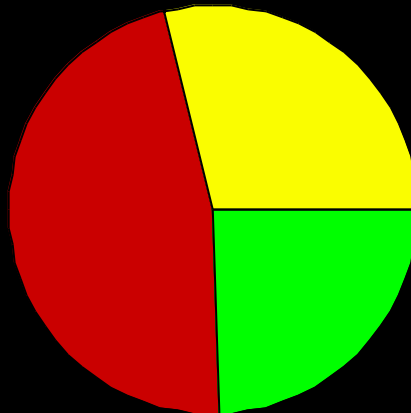


Susan Jobling

# ***Estrogens in the U.K. Aquatic Environment .....The History***

- ***1980s.....Treated sewage effluents throughout the u.k. are estrogenic to fish. (Purdom et al, 1994).***
- ***1993.....Alkylphenolic chemicals, (breakdown products of industrial detergents) are estrogenic and inhibit testicular growth and development in male fish. (Jobling et al 1993, and 1996).***
- ***1996.....The estrogenic activity of treated sewage effluent persists in rivers (downstream of discharges). (Harries et al 1996 and 1997)***
- ***1997.... More culprit chemicals: Natural and synthetic hormones(ethynylestradiol, estradiol and estrone). Desbrow et al 1998***
- ***1998....Widespread sexual disruption in wild fish living in rivers contaminated by effluents. (Jobling et al 1998)***

***Wild roach living in rivers that receive STW effluents exhibit disruption of both the reproductive ducts and the germ cells.***



**■ oocytes**  
**■ ovarian cavity**  
**■ Oocytes & ovarian cavity**



# *When Are Fish Most Vulnerable To the Effects Of Endocrine Disrupting Chemicals?*

**Fertilised Egg**

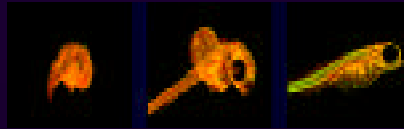
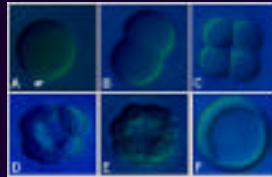
**Embryo**

**Larval Stage**

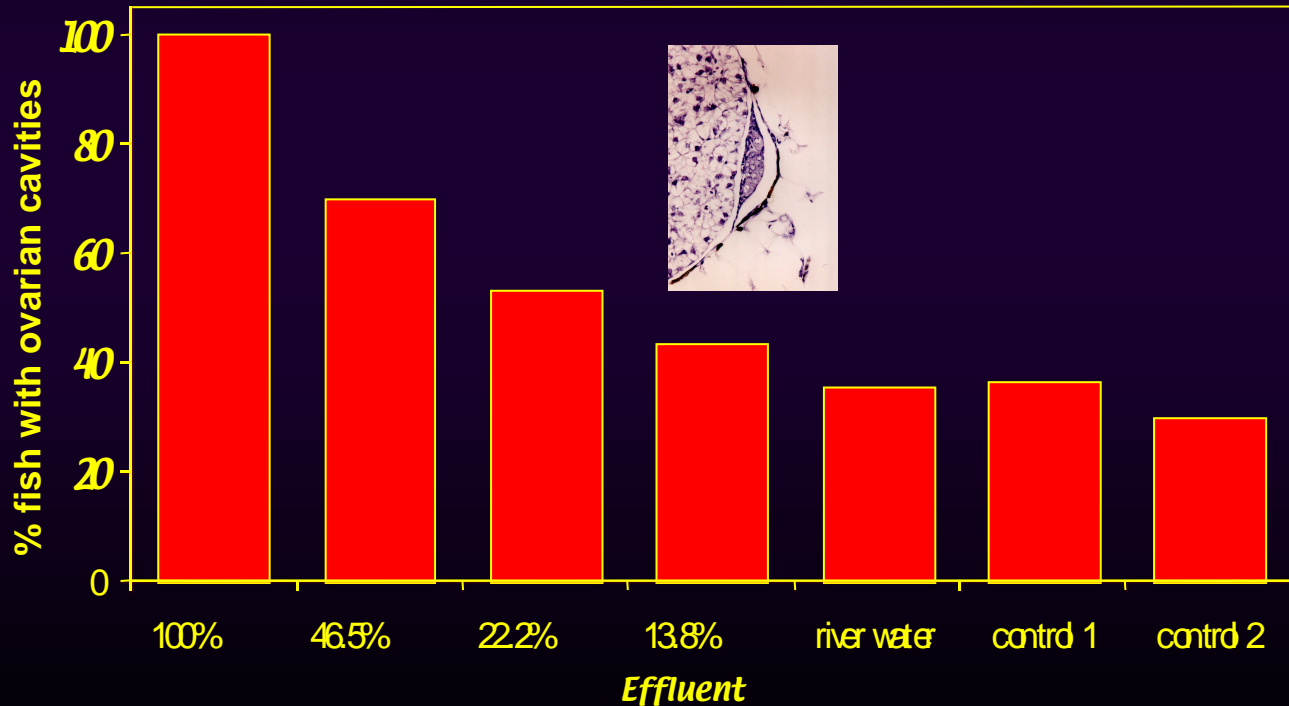
**Juvenile Stage**

**Puberty**

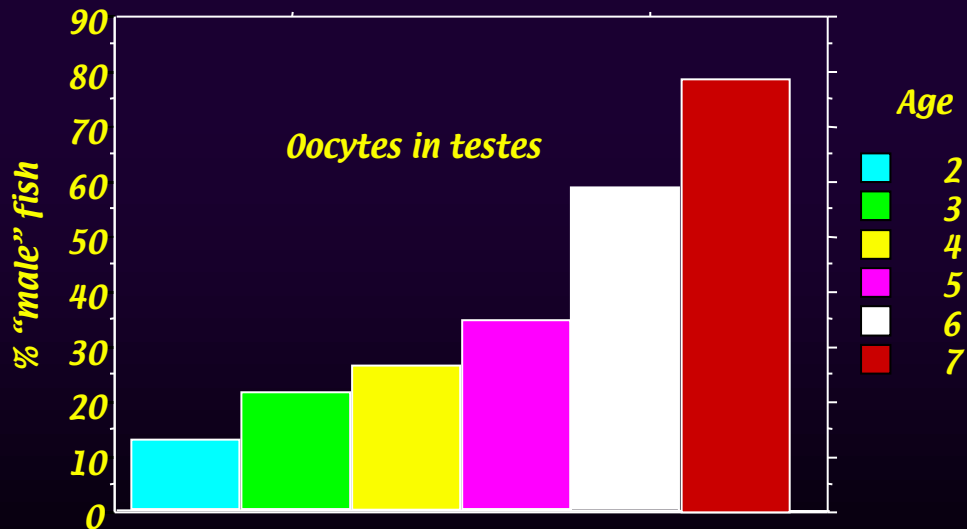
**Mature Adult**



***Exposure of roach to estrogenic STW effluents during early life causes dose-dependent disruption of the reproductive ducts, but NOT the germ cells.***



*Preliminary studies suggest that the induction of oocytes in the testes of intersex roach may occur throughout life ?*



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