OLFACTORY SENSITIVITY TO STEROIDS IN THE FRESHWATER CYPRINID, *Tinca tinca*

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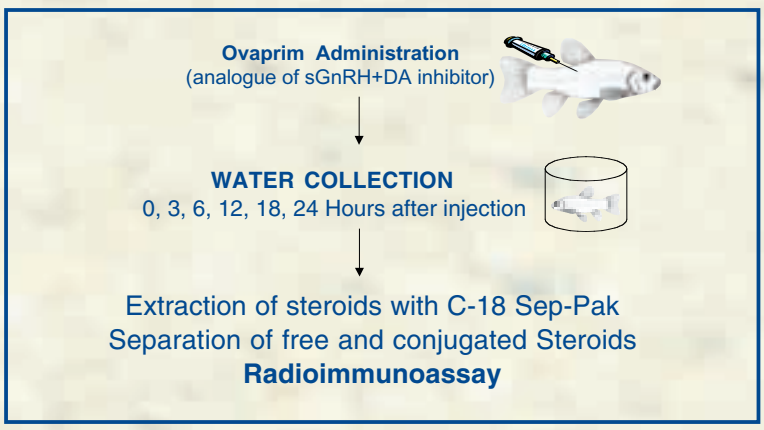
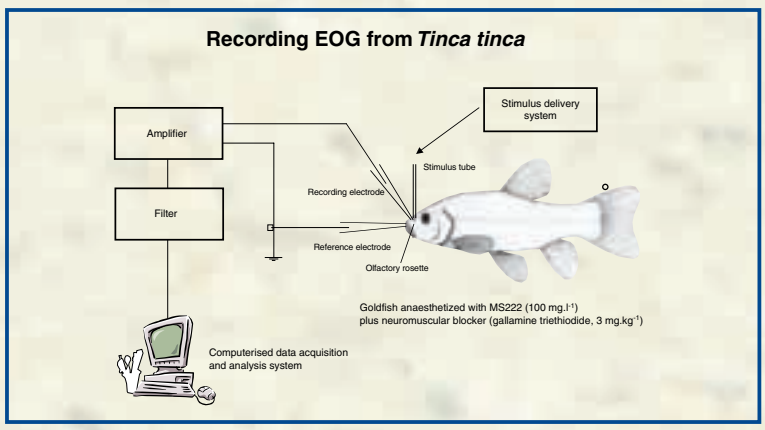
Aims:

The aims of the present work were:

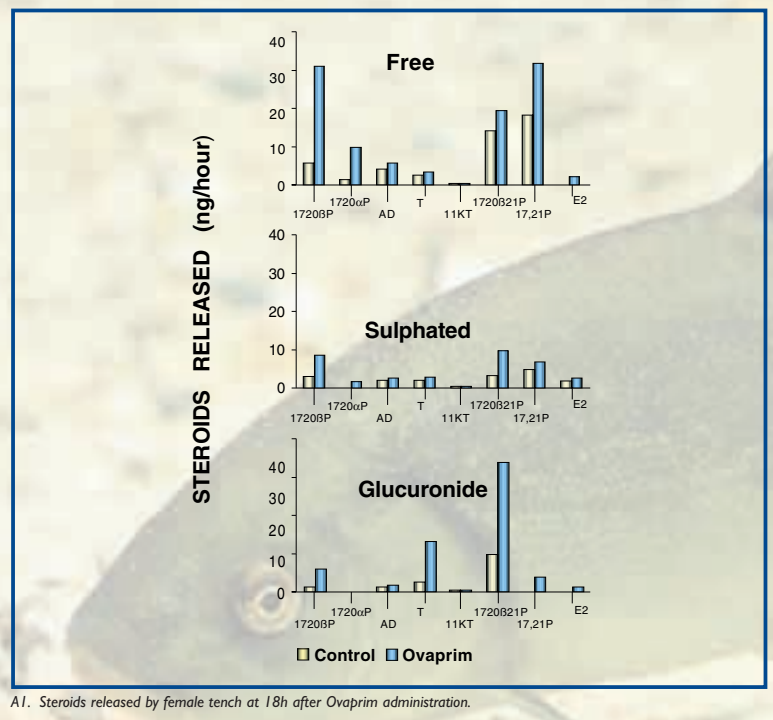
1. To determine which sex steroids are release into the water by sexually mature female tench after hormonal induction of final oocyte maturation.
2. Which of these steroids can be detected by the olfactory epitheliun of male tench.

Methods:

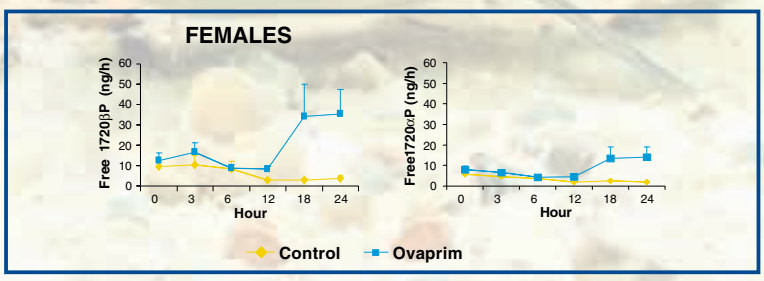




Results:

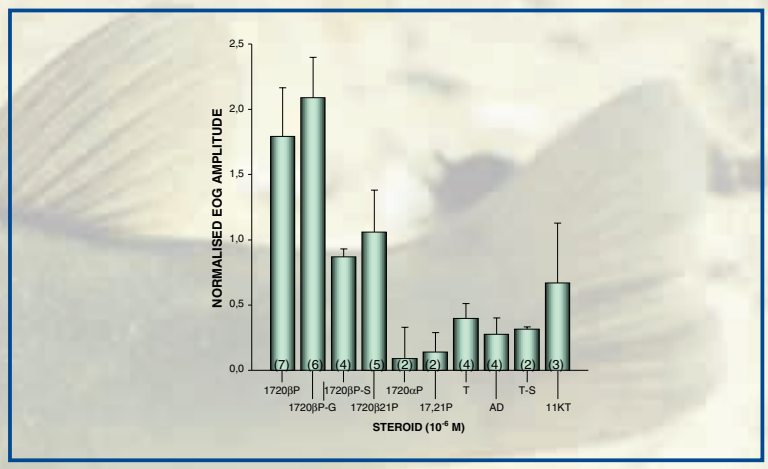


A1. Steroids released by female tench at 18h after Ovaprim administration.

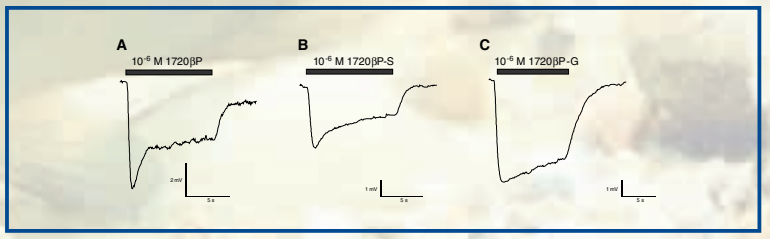


A2. Profile of release of 1720βP and 1720αP at different times after Ovaprim administration.

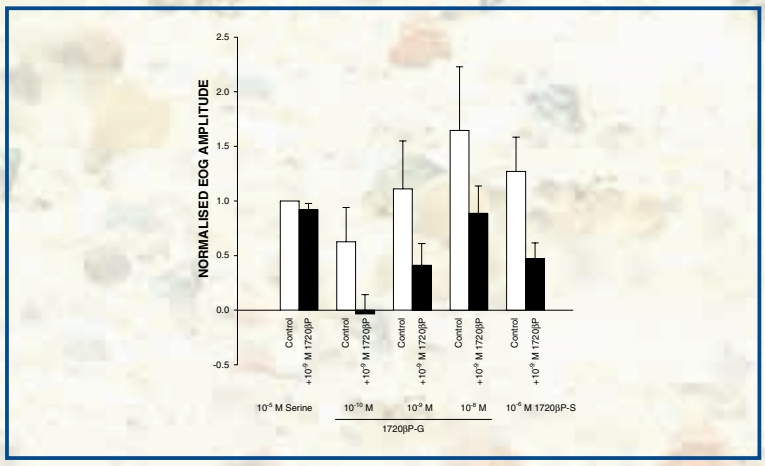
1720βP : 17α,20β-dihydroxy-4-pregnen-3-one
1720βP-S : 17,20β-P 20-Sulphate
1720βP-G: 17,20β-P 20-Glucuronide
1720αP : 17α,20α-dihydroxy-4-pregnen-3-one
AD : Androstenedione
T : Testosterone
T-S : T-Sulphate
11-KT : 11-ketostestosterone
1720β21P : 17α,20β-21-trihydroxy-4- pregnen-3-one
1721-P : 11-deoxycortisol



B1. Relative olfactory sensitivity of male tench to C_{21} and C_{19} steroids using EOG (electroolfactography).



B2. Typical EOG recordings from male tench in response to free, sulphated and glucuronidated 1720βP.



B3. Cross-adaptation of tench olfactory receptors to 1720βP and its conjugates.

Conclusions:

A.
- At 18 h after Ovaprim administration there was an increase in the rate of release of sex steroids into the water.
- Free 1720βP and 1720α-P were the steroids which showed the sharpest increase.

B.
- Male tench are much more sensitive to C21 steroids (e.g. 1720βP and 1720β,21P) than C19 steroids (e.g. testosterone and androstenedione)
- The male tench is equally sensitive (up to 8 mV at 10^{-6}M) to free and glucuronidated 1720βP.
- The olfactory sensitivity to free and glucuroninated 1720βP appears to be mediated by the same receptor.
- Despite the fact that the female releases 1720αP into the water, the male is not able to detect it.
- The olfactory system of male tench is also highly sensitive to prostaglandin $F_{2\alpha}$ and its metabolite, 15-keto PG $F_{2\alpha}$ (data not shown).