'OUT-OF-SEASON' PRODUCTION OF 17,20□-DIHYDROXYPREGN-4-EN-3-ONE CHALLENGES THE DOGMA THAT IT IS SOLELY A 'MATURATION-INDUCING HORMONE' IN FISH

Scott, Alexander P. and Ellis, Tim

Centre for Fisheries, Environment and Aquaculture Research (Cefas), Barrack Road, Weymouth, Dorset, DT4 8UB, UK. e-mail: Alexander.Scott@cefas.co.uk

The two main progestins in teleost fish, 17,20β-dihydroxypregn-4-en-3-one (17,20β-P) and 17,20β,21-trihydroxypregn-4-en-3-one (17,20β,21-P), are widely believed to be solely involved in the very final stages of the reproductive cycle (i.e. final oocyte maturation/ovulation in females and spermiation in males). However, we have discovered two peaks of production (i.e. high levels in blood and water) of these two steroids in male and female roach (*Rutilus rutilus*; a cyprinid), one around the time of spawning in early summer and the other in the late summer and early autumn, when the gonads are at a relatively early stage of development (early vitellogenesis in females and primary spermatocyte formation in males). Although the coincidence of elevated 17,20β-P levels and primary spermatocyte formation in males favours a proposed role in initiation of the first meiotic division [1], there is no such correlation in another cyprinid, the tench *Tinca tinca* (in which a late summer peak of 17,20β-P was also observed; [2]). The secretion of these steroids at times of the year other than spawning highlights how much more there is to learn about the function of progestins in teleosts.

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References:

[1] MIURA, T., HIGUCHI, M., OZAKI, Y., OHTA, T., MIURA, C., 2006. Progestin is an essential factor for the initiation of the meiosis in spermatogenetic cells of the eel. Proc. Natl. Acad. Sci. U S A., 103: 7333-7338.

[2]ANTONOPOULOU, E., TSIKLIRAS, A. C., KOCOUR, M., ŽLÁBEK, V., FLAJŠHANS, M., GELA, D. PIAČKOVÁ, SCOTT, A. P. (2011). Teleost maturation-inducing hormone, 17,20β-dihydroxypregn-4-en-3-one, peaks after spawning in *Tinca tinca*. Gen. Comp. Endocrinol., 172: 234–242.