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Title: **Effects of GnRHa (D-Ala^6, Pro^9-NEt) combined with domperidone on ovulation induction in wild loach *Misgurnus anguillicaudatus***

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Abstract: The effects of a single intramuscular injection of gonadotropin releasing hormone analogue (GnRHa) alone or in combination with the dopamine antagonist domperidone (DOM) on ovulation induction of loach *Misgurnus anguillicaudatus* broodstocks collected from the wild were tested under routine hatchery conditions. The ovulation ratio, latency period, ovulation index, fertilization success and hatching rate were evaluated. The following hormone treatments were tested: 2 mg kg^{-1} BW of CPE as a positive control (PC), GnRHa alone at doses of 10 μg (G10), 20 μg (G20), 40 μg (G40) and 60 μg (G60) kg^{-1} BW and combinations of GnRHa and DOM at doses of 5 μg + 2.5 mg (GD5), 10 μg + 5 mg (GD10), 20 μg + 10 mg (GD20) and 40 μg + 20 mg (GD40) kg^{-1}, respectively. Physiological saline injected fish were used as a negative control (NC). The results showed that the combination of 20 μg + 10 mg (GD20) and 40 μg + 20 mg (GD40) kg^{-1} of GnRHa and DOM, respectively, injection led to higher ovulation ratio and shorter latency periods in comparison with the control and the other hormone treatments ($P<0.05$), and there was no significant difference between the two ovulating groups with respect to ovulation ratio and latency period ($P>0.05$). There was a significant difference between the GnRHa alone groups and the GnRHa + DOM combined groups on the ovulation index (the former < the latter, $P<0.05$),while no significant differences in the fertilization success and hatching rate were found in any of the hormone treatments ($P>0.05$). Only 20% of the fish ovulated in group G10 and G20, and no fish ovulated in group NC, suggesting a dopaminergic inhibitory action on gonadotropin (GtH) secretion in this fish at the preovulatory stage. Therefore, it can be concluded that like many other cyprinids, dopamine inhibitory action was operating in loach and it was necessary to combine GnRHa

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with a dopamine antagonist for ovulation induction. As a result, ovulation can be induced successfully in loach broodstocks with 20 μg kg^{-1} GnRHa + 10 mg kg^{-1} DOM treatment in a single injection without any negative effect on egg quality. Application of this combination could be beneficial for hatchery and broodstock management in loach culture.

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