



Endocrine disruption, oxidative stress, and testicular damage induced by 4-nonylphenol in *Clarias gariepinus*: the protective role of *Cydonia oblonga*

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Abstract:

Exposure to xenoestrogens like 4-nonylphenol (NP) is recognized by disrupting endocrine functions and causes reproductive dysfunction in male fish. The present study aimed at investigating the 4-nonylphenol propensity to induce oxidative stress and hormonal disturbances in male catfish and at studying the protective role of quince (*Cydonia oblonga*). To fulfill this aim, catfish *Clarias gariepinus* were exposed to pure 100 µg/L 4-NP and to quince the leaf extract added to 4-NP, both for 15 days. The 4-NP exposure induced a marked increase in 17β-estradiol (E2), LH, and cortisol, while thyroid hormone (TSH, T3), testosterone (T), and FSH levels noticeably decreased; however, 4-NP had no effect on T4 level. Moreover, 4-NP exposure was accompanied by histological impairments in testes. Existence of 4-NP was associated with oxidative damage as evidenced by the significant increase (p

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