



Protective effect of *Nigella sativa* on 4-nonylphenol-induced nephrotoxicity in *Clarias gariepinus* (Burchell, 1822)

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Abstract:

The aim of this study was to examine the protective effects of *Nigella sativa* (*N. sativa*) on 4-Nonylphenol-induced nephrotoxicity in *Clarias gariepinus*. 30 fishes were divided into five groups: control, 4-nonylphenol-treated, 1% *N. sativa* treated, 2.5% *N. sativa* treated, and 5% *N. sativa* treated. *N. sativa* and 4-Nonylphenol were given for 3 weeks. 4-NP and 4-NP-*N. sativa* treated fishes were compared with the control group. Kidney histology, immunochemistry, and electron microscope were assessed after 4-NP exposure. In the African catfish, 4-NP is mainly excreted through the kidney causing nephrotoxicity. Our results showed that 4-NP administration significantly disturbed the kidney structure and function. 4-NP treated fishes showed dilated glomerular vessels, fewer glomerular cells content, decreased expressions of glomerular proteins, and increased level of autophagy compared to control group ($P < 0.05$). As *N. sativa* has different immunological and pharmacological effects such as anti-apoptotic and anti-oxidant, therefore, the administration of *N. sativa* with 4-Nonylphenol significantly minimize the nephrotoxic effect of 4-NP and maintain the normal kidney structure and function. Our novel study demonstrated for the first time that *N. sativa* could protect the kidney against 4-NP induced-nephrotoxicity.

Keywords:

Catfish, Nephron, 4-NP, *Nigella sativa*, Glomerulus

Published In:

Science of the Total Environment , 17;619-620 , 692-699