



The biological activity of new thieno[2,3-c]pyrazole compounds as anti-oxidants against toxicity of 4-nonylphenol in *Clarias gariepinus*

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Abstract:

Synthesis of bi functionally substituted thieno[2,3-c]pyrazole compounds was carried out by a new method. The substituted group at position five is namely (carbonitrile, carboxamide, N-(substitutedphenyl) carboxamide and benzoyl group). Chloroacetylation of the amino thieno[2,3- c]pyrazolecarboxamide compound afforded the chloroacetyl amino derivative. The chemical structure of the newly synthesized compounds was established by elemental and spectral analysis including IR, ¹H NMR spectra in addition to ¹³C NMR and mass spectra for most of them. In the present work, we assessed the role of the new synthesized thieno[2,3-c]pyrazole compounds as antioxidants against the toxicity of the 4-nonylphenol on the red blood cells of the most economically important Nile fishes namely African catfish (*Clarias gariepinus*). The erythrocytes alterations were used as biological indicators to detect those effects. After exposure to 4-nonylphenol, the erythrocytes malformations (swelled cells, sickle cells, tear drop like cells, acanthocytes, and vacuolated cells) were recorded in highest number in comparison with other groups control and those injected with thieno[2,3-c]pyrazole compounds. So, the new thieno[2,3-c]pyrazole compounds can be used as antioxidants against toxicity of 4-nonylphenol on fishes.

Keywords:

Synthesis Thienopyrazole Thienopyrazolopyrimidine RBCs *Clarias gariepinus*

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