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Synthesis of coumarin derivatives and its Ru(II) complexes encompassing pyrazole ring as a potent antidiabetic agents – A biochemical perspective(Article)

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Abstract

A series of two new organoruthenium complexes have been synthesized incorporated by 4-chloro-3-formyl coumarin with 4-aminoantipyrine and morpholine respectively. The ligands (CumAP and MorcumAP) were synthesized through the new route like substitution as well as condensation method. Spectral and analytical techniques such as elemental analysis, IR, UV–vis, 1H NMR and 13C NMR and XRD provided proof of the formation of the ligands and complexes. To evaluate the antidiabetic activity of synthesized ligands and their Ru(II) complexes were subjected in both in vivo and inslico approach. The results indicated that the supplementation with MorcumAP, CumAP and $(CumAP)_2Ru(II)$ complex to diabetic-induced group, activities of superoxide dismutase, catalase and glutathione peroxidase were found to be nearer to control. LPO (Lipid peroxidation) levels were analyzed in serum, liver and kidney of mice. On comparing with organic moiety ruthenium complex shows enhanced effectiveness towards anti diabetic cells. In silico studies also support the experimental results. Overall the results of revealed that the element Ru which enhance the druggability properties of the coumarin derivatives.

Author keywords

4-Aminoantipyrine | 4-Chlorocoumarin aldehyde | Anti diabetic agents | Histopathology | LPO | Morpholine

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