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Title:	Solvent induced distortion in a square planar copper(II) complex containing an azo-functionalized Schiff base: Synthesis, crystal structure, in-vitro fungicidal and anti-proliferative, and catecholase activity
Authors:	Joshi, Mayank (/jspui/browse?type=author&value=Joshi%2C+Mayank) Choudhury, Angshuman Roy (/jspui/browse?type=author&value=Choudhury%2C+Angshuman+Roy)
Keywords:	Copper(II) Electrochemical analysis Catechol oxidation activity Schiff base
Issue Date:	2021
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Citation:	Journal of Molecular Structure, 1245, 131057.
Abstract:	<p>This research work reports the synthesis, single crystal X-ray structure, catechol oxidation, fungicidal and antiproliferative activity of a newly synthesized copper(II) complex, $[\text{Cu}(\text{L})_2]\text{H}_2\text{O} \cdot \text{CH}_3\text{OH}$ (1) containing an azo-functionalized Schiff base, HL = 2-methoxy-6-((Z)-((4-((E)-phenyldiazenyl)phenyl)imino)methyl)phenol. The crystal structure analysis reveals that the Cu(II) centre exists in a highly distorted square planar geometry. The crystallize water and methanol form a strong intermolecular association through H-bonding. More importantly, the H atoms of the lattice water interact with the O atoms of ligand units leading to 5- and 6-membered cycles through the H-bonding network and distort the square planar geometry. The copper(II) complex has emerged as a bioinspired catalyst in the oxidative transformation of 3,5-di-tert-butylcatechol (DTBC) to o-benzoquinone in methanol with a high turnover number, $4.75 \times 10^2 \text{ h}^{-1}$. Electrochemical analysis of the copper(II) complex in presence of DTBC recommends the generation of catechol/o-benzosemiquinone redox couple in the course of oxidation. The EPR spectral analysis of 1 in presence of DTBC was found silent and suggested the antiferromagnetic interaction between copper centre and benzosemiquinone species. The copper(II) complex turns out to be a potential fungicidal agent against clinical candida albicans and scanning electron microscope studies confirm the destruction of the fungal cell membrane with the deposition of copper. The IC₅₀ value of the copper complex was determined as 15 $\mu\text{g/mL}$ which suggests the excellent antiproliferative potency of the synthetic compound against the breast cancer cell lines, MCF-7.</p>
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URI:	https://doi.org/10.1016/j.molstruc.2021.131057 (https://doi.org/10.1016/j.molstruc.2021.131057) http://hdl.handle.net/123456789/4938 (http://hdl.handle.net/123456789/4938)
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