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Peer Review

Review of: "New Insight into Erythema Reduction Induced by Quercetin-Metal Ion Chelates"

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The manuscript of authors Alain Bolaño Alvarez et al. under the title "New Insight into Erythema Reduction Induced by Quercetin-Metal Ion Chelates" explores the interactions of quercetin (Q) with metal ions (Fe^{2+} and Cu^{2+}) to evaluate their combined anti-inflammatory effects in reducing skin erythema. Q-metal chelates were synthesized at a 1:1 stoichiometry, demonstrating distinct spectroscopic properties linked to specific coordination sites. Cu^{2+} preferentially binds to the benzoyl group (Ring A), while Fe^{2+} coordinates with the cinnamoyl group (Ring B). Both Q-Cu^{2+} and Q-Fe^{2+} chelates exhibited enhanced anti-inflammatory effects compared to quercetin alone, with Q-Fe^{2+} showing superior efficacy.

The authors claim that the Q-metal chelates were synthesized in a 1:1 stoichiometric ratio. How do the authors explain this claim in light of the fact that fisetin forms Fe complexes in a 2:1 stoichiometric ratio, see reference 10.1039/c0dt01834a?

Fe^{3+} is a harder Lewis acid compared to Fe^{2+}. It has a stronger tendency to form complexes with oxygen-containing ligands. It is known to form more stable complexes with quercetin than Fe^{2+} due to its higher oxidation state, which increases its affinity for electron-donating groups in quercetin. In light of this, how do the authors explain that they obtained Fe^{2+} complexes?

Declarations

Potential competing interests: No potential competing interests to declare.

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