

Metal coordination and tyrosinase inhibition studies with Kojic- β Ala-Kojic.

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Streszczenie

Kojic acid is a natural antifungal and antibacterial agent that has been extensively studied for its tyrosinase inhibitory and metal coordination properties. Tyrosinase is a metalloenzyme with two copper ions in the active site. It is widely accepted that the tyrosinase inhibitory activity of kojic acid is related to its ability to coordinate metals. Over the past five years, we have used kojic acid to synthesize new and efficient bis-kojic acid chelators of iron and aluminium. In parallel, we investigated whether the de novo designed ligands could interfere with proper tyrosinase functioning. The present study combines our experience with inhibition and coordination studies of the new ligand: Kojic- β Ala-Kojic. Research aimed at the assembly of a new potent tyrosinase inhibitor was based on the well-known crystal structure of the enzyme. Two questions were whether two kojic acids could act better than one and to what extent the length and kind of linker could ameliorate metal coordination, and inhibitory activity. Our results show that Kojic- β Ala-Kojic has high affinity for Fe(III), Al(III), Zn(II), and Cu(II) and strong tyrosinase inhibitory effect and it can be proposed for use in industrial and pharmaceutical applications.

Słowa kluczowe

tyrosinase inhibitor, Kojic acid, synthesis, metal complexes

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