

Transition metal complex of chemically modified Osthole and zinc salt as effective antimicrobial agent

Zubaid ul Khazir, Mehraj Ud Din Bhat, Gulam Nabi Yattoo , Javid Ahmad Banday

Department of Chemistry, National Institute of Technology, Srinagar, 190006, India.

Abstract: Osthole isolated from *Presngass Pebularia* was hydrolysed to its acid derivative followed by complexation with Zinc salt. A milky polycrystalline precipitate of Zn-Osthole acid complex was obtained in appreciable yields. The formation of the complex was confirmed by adopting various spectral techniques viz FTIR, XRD. The synthesised complex was subjected to antimicrobial screening and the complex showed appreciable potency against bacterial and fungal pathogens.

Intoduction: Natural products and their derivatives contribute greatly to the global medicine. Over the last 34 years natural products and their derivatives contribute near about 50 % of all the drugs approved by FDA from 1981 to 2014 [1]. The synthetic modification of Natural Products by complexation with different metals is an efficient way by which we can tune the pharmacological activity of Natural Products.

Interaction of Metal salt with the NP derivative ligand: To a methanolic solution of Acid derivative of Osthol (0.02 mol, 100 ml) , excess of K_2CO_3 was added, followed by gradual addition of methanolic solution of Zinc salt (0.01 mol, 100 ml). The resulting solution was refluxed for about 3 hrs at 40 °C. A white precipitate was formed, which was filtered and separated through Whatman filter paper no. 1 and washed with methanol followed by water. The complex was finally dried in vaccum oven.

Results and Discussion:

Spectral Analysis: The IR spectra of the complexes were recorded from STIC Kerala in the range of 4000-500 cm^{-1} .

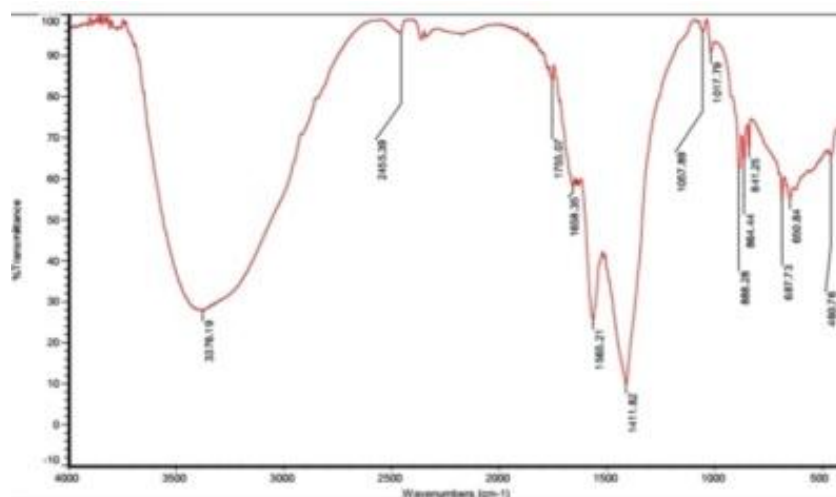
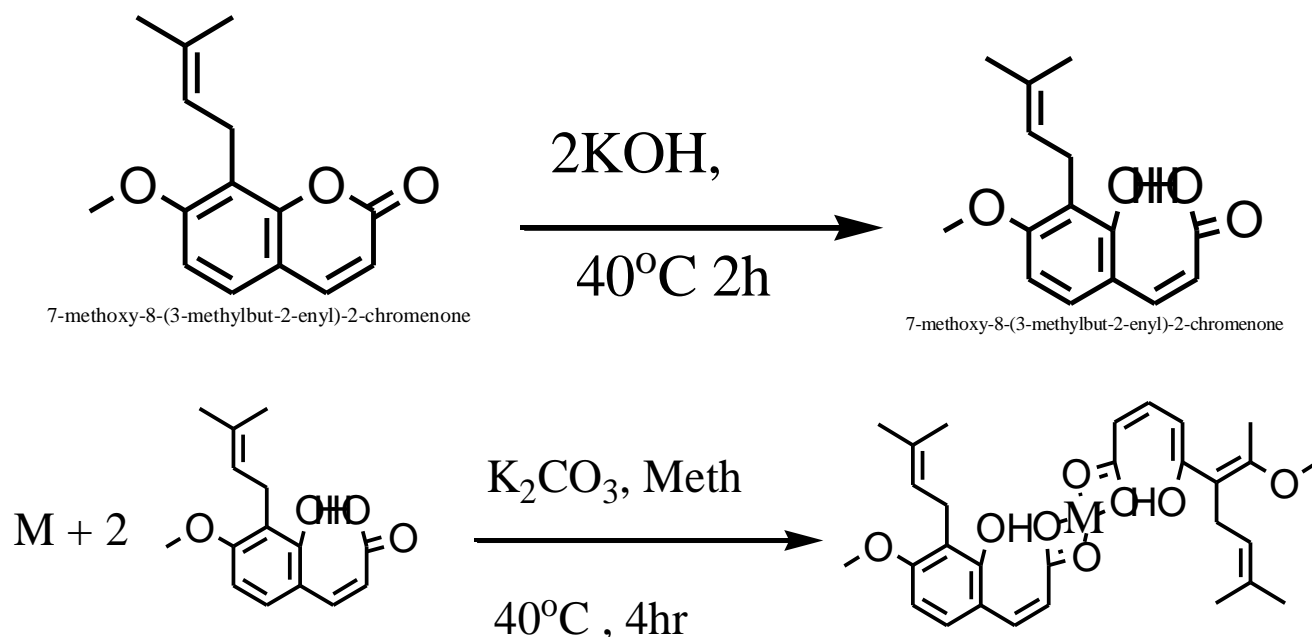


Figure (1): represents the IR spectra of the complex.

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The resulting complex showed appreciable decrease in the vibrational frequency of the carbonyl group from 1672 cm^{-1} to 1613 cm^{-1} suggesting the possible involvement of the carbonyl group in Metallation. The M-O band was observed at about 454 cm^{-1} characteristic of Zn-O bond. The complex showed sharp peaks in PXRD spectra indicating polycrystalline nature of the complex. Due to its less solubility in water and most of the organic solvents actual crystalline form was not obtained. The TGA of the complex were performed from physical chemistry lab of our department and the complex were found to be thermally stable.

Proposed Reaction



Biological Activity The complex showed enhanced antifungal potential towards both the tested fungal strains: *Candida Albicans* and *Aspergillus fumigatus* with MIC values of 2.5 and 1.75 respectively. However it showed less potency towards the bacterial pathogen *E. coli* with MIC value of 4.75 and showed slightly better potency against *S. typhi* with mic value of 3.5. Moreover it was confirmed that piperic acid showed less potency against both bacterial and fungal pathogens than its synthesised analog

Key words: Osthole, Complexation, Sprctral analysis, Antimicrobial screening.