

## Antimicrobial activity of dithiocarbamate sodium salts and their Zn (II) and Ni (II) complexes

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**Background and Aims:** The growing interest in the chemistry of sulphur donor ligands such as dithiocarbamates are due to their biological activities as well as their widespread industrial application. In our previous studies, some dithiocarbamate ligands and metal complexes were synthesized. In this study, these compounds were screened for their antimicrobial activity against various microbes in the hope of finding a new antimicrobial agent.

**Methods:** 15 different ligands of dithiocarbamate (as sodium salts) and their Zn (II) and Ni (II) complexes have been characterized by elemental analysis, molar conductance, IR, electronic and <sup>1</sup>H NMR spectroscopic studies. All compounds were evaluated for their in vitro antimicrobial activities against human pathogens (12 bacterial and 3 fungal strains) by disk diffusion method. The MICs of compounds were also determined by agar dilution method.

**Results:** Although antimicrobial activity was highly dependent on the different compound's structure, concentration and type of microb, but all synthesized compounds showed significance antimicrobial activity. Among the ligands, octyldithiocarbamate and morpholine dithiocarbamate showed the most favorable antibacterial activity. Also the best results between the metal complexes have been obtained with Bis (octyldithiocarbamate) Nickel (II), Bis (hexyldithiocarbamate) Nickel (II), Bis (hexyldithiocarbamate) Zinc (II), and Bis (morpholineddithiocarbamate). In the case of antifungal activity; nonyldithiocarbamate, Bis (Octyldithiocarbamate) Nickel (II), Bis (hexyldithiocarbamate) Nickel (II) and Bis (etyldithiocarbamate) Zinc (II) showed a high potent against *C.albicans*. All of the synthesized compounds were found to have remarkable bacterial and fungicidal activity, but the biological activity is enhanced upon complexation with the metal ion.

**Conclusions:** The studied compounds were found to have the potential in biological activity especially antibacterial and antifungal activity, where this possibly can be used for clinical trials after further research.

**Keywords:** Dithiocarbamate; Antibacterial; Antifungal