

## PHYTOCHEMICAL STUDIES OF TRANSITION METAL COMPLEXES OF DIMEDONEBIS(THIOSEMICARBAZONE) and NEEM PRODUCTS

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Thiosemicarbazides are of considerable interest because of their mode of bonding, stereochemistry and potentially beneficial biological activity against bacteria, fungi, virus, amoeba and tumor. The biological activity of many drugs is found to be increased on complexation with metal ions. Thiosemicarbazones and their metal complexes exhibit a wide range of applications that stretch from their use in analytical chemistry through Pharmacology to Nuclear medicine.

Multi resistant bacterial strains are a growing public health concern worldwide. The existing bacterial populations have developed resistance to the compounds found in nature. The advantage of new synthetic chemicals is that the bacterial population would not have found an opportunity to develop resistance by prior exposure.

The neem (*Azadirachta Indica*) is one of the most useful traditional medicines in India as a source of many therapeutic agents. It grows well in tropical and semitropical countries. Scientific research is being conducted to explore the medicinal properties of *A. Indica*. Recently research is going on to find out the synergistic antibacterial activity of herbal products and synthesized medicines.

The ligand dimedonebis(thiosemicarbazone), Ni(II) and Cu(II) complexes were synthesized and characterized and tested for antimicrobial activity against *Salmonella typhi*, *Vibrio cholera*, *Escherichia Coli* and *Pseudomonas*. The ligand is found to be tetra coordinated. The Ni(II) ion formed octahedral monomeric complex  $NiL(H_2O)_2$ . Cu(II) complex was found to be dimeric as  $Cu_2L_2$ .

The results of antimicrobial studies of ligands and complexes revealed that the free ligand( $LH_2$ ) does not have effective antimicrobial activity against the selected microorganisms, while Ni(II) and Cu(II) complexes have antimicrobial activity. The Ni(II) complex shows more activity than Cu(II) complex. The Ni(II) complex was found to be more active towards the *Salmonella typhi* and least to *Vibrio cholera*. The chelation with metal ions induced significant changes in the biological activity of the ligand.

The leaf extract and the neem oil extract in ether were analyzed for the antimicrobial activity against the same bacterial strains *Salmonella typhi*, *Vibrio Cholera*, *E.coli* and *Pseudomonas* by measuring the inhibition area on agar plates by disc diffusion method. The leaf extract is more effective than oil towards *Salmonella typhi*, *Vibrio cholera* and *E.Coli*. Neem oil is more effective towards *Pseudomonas* than leaf extract.

The combined antibacterial activity of the synthesized ligand and complexes with neem leaf extract and neem oil were found out by disc diffusion method. The antimicrobial activity of *A.Indica* is enhanced by mixing with the Ni(II) complex of dimedonebis(thiosemicarbazone).The free ligand and the cu(II) complex are not much effecting the activity of *A.Indica*. The synergistic antibacterial activity of Ni(II) and neem products against *Salmonella typhi* is remarkable.