

“Antibacterial investigation of α -Benzilmonoximehydrazone-N, N-dimethylaminobenzaldehyde and its Fe(II), Ni(II) and Pd(II) complexes”

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Abstract

The synthesis of α -Benzilmonoximehydrazone-N, N-dimethylamino-benzaldehyde and its Fe(II), Ni(II) and Pd(II) metal complexes. Each complex was prepared by the reaction of the ligand with appropriate metal salts (ML_2) composition, where M = metal and L = Ligand). The synthesized ligand and its metal complexes were screened for their biological activity against bacterial species, three gram positive bacteria (*B. subtilis*, *S. aureus*, *S. typhi*) and three gram negative bacteria (*E. coli*, *K. pneumoniae*, *P. aeruginosa*)

Keywords: Schiff bases, Antimicrobial, Antifungal, Antibacterial, Benzilmonoxime

1. Introduction:

Azomethine group containing (-C=N-) group known as Schiff bases prepared by the reaction between primary amines and aldehydes or ketones group¹⁻². They form a significant class of compounds in pharmaceutical and medical chemistry with several biological applications such as, antifungal³⁻⁶, antibacterial⁷⁻⁸, antioxidant⁹, anticancer⁸, neurological disorders¹⁰ and diuretic activities¹¹. They are the important compounds owing to their wide range of industrial applications in food industry, dye industry, analytical chemistry, catalysis, agrochemicals¹²⁻¹³. In our previous article¹⁴, we are synthesized title compounds and they are characterized by elemental analysis and some spectral data. Prepared compounds are one of the best examples of Schiff bases, because two Schiff bases are present.

After scanning of literatures, we are concluded that the Schiff bases are remarkably effective against various strains of microorganisms. The synthesis and characterization of title compounds are reported earlier. In view of this, we wish to antimicrobial evaluation of α -Benzilmonoximehydrazone-N, N-dimethylamino-benzaldehyde (HBOHPDB) and its Fe(II), Ni(II) and Pd(II) metal complexes¹⁴. Prepared compounds antibacterial activities check against six bacterial strains by Agar cup method.

Experimental:

Benzilmonoximehydrazone-N, N-dimethylamino-benzaldehyde and its Fe(II), Ni(II) and Pd(II) metal complexes are prepared by reported methods¹⁴.

Antibacterial Screening:

Antibacterial activity was carried out by agar cup method against *E. coli*(G-), *S. aureus*(G+), *S. typhi*(G+), *B. subtilis*(G+), *K. pneumoniqe*(G+), and *P. aeruginosa*(G+). Four different concentrations 50, 100, 200, 500ppm were used for determination of the activity. Zone of inhibition was measured in mm.

Results and Discussions:

Table-1 shows the antibacterial activity of the Benzilmonoximehydrazone-N, N-dimethylamino-benzaldehyde and its Fe(II), Ni(II) and Pd(II) metal complexes and. It was found that prepared compounds are effective in inhibiting the microbial growth. The minimum inhibitory concentrations of the all compounds are 50ppm. Similar kinds of observation were made in many previous studies. The possible reason behind this may be the interaction between Schiff bases group with lipoproteins of the cell and also the effects their higher stability at higher temperature may also allow them to use them as a potential antimicrobial agent.

Table-1: Antibacterial activities of Benzilmonoximehydrazone-N, N-dimethylamino-benzaldehyde and its Fe(II), Ni(II) and Pd(II)metal complexes

Compound	E. coli				S. aureus				S. typhi				B. subtilis				K. pneumoniq				P.aeruginosa			
	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500
HBOHPDB	-	18	20	24	7	15	19	21	9	12	13	17	12	13	15	20	-	9	12	14	10	12	14	20
Fe(BOHPDB) ₂	15	20	22	26	19	23	23	24	18	21	22	22	12	17	19	22	-	12	13	16	12	13	15	25
Ni(BOHPDB) ₂	16	22	29	30	18	21	22	25	17	18	19	20	17	19	20	21	-	10	16	18	17	19	20	23
Pd(BOHPDB) ₂	16	26	32	37	18	20	20	28	18	18	19	19	12	14	19	20	-	10	16	17	18	19	22	26

Conclusion:

The 'Benzilmonoximehydrazone-N, N-dimethylamino-benzaldehyde and Fe(II), Ni(II) and Pd(II) metal complexes' was evaluated for their antimicrobial activities. It was observed that effective antimicrobial activities and minimum inhibition concentrations is 50ppm. This concludes that certain processes of condensation dominantly affect the biological behavior of the compounds with higher potential against some bacterial and fungal strains.

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