

## Synthesis of Piperidine and P-Chloroaniline Mannich Bases and Investigation of their Antioxidant and Antimicrobial Properties

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This research was aimed at synthesizing Mannich bases of piperidine and p-chloroaniline derivatives and investigating their antioxidant and antimicrobial activities since report has it that Mannich bases possessing electron withdrawing group show good anti-oxidant, antimicrobial, anti-cancer and anti-tumour properties. The synthesized compounds were characterized by Nuclear Magnetic Resonance (NMR), Infra red (IR) and Ultra/Violet-Visible (UV-V) spectroscopy. 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical and Agar Well diffusion methods were used for the antioxidant and antimicrobial screening respectively. Eight Mannich bases namely N,3-diphenyl-3-(piperidin-1-yl)propanamide (MB1), 3-((4-chlorophenyl)amino)-2-hydroxy-1,2,3-triphenylpropan-1-one (MB2), 2-((3-((4-chlorophenyl)amino)-3-phenylpropanoyl)oxy)benzoic acid (MB3), 3-(((4-chlorophenyl)amino)(phenyl)methyl)-5,7-dihydroxy-2-(4-hydroxyphenyl)chroman-4-one (MB4), 3-((4-chlorophenyl)amino)-3-(4-hydroxy-3-methoxyphenyl)-1-phenylpropan-1-one (MB5), 3-((4-chlorophenyl)amino)-N,3-diphenylpropanamide (MB6), benzoic 2-((4-chlorophenylamino)methyl)benzoic peroxyanhydride (MB7) and 3-(4-chlorophenylamino)-1,3-diphenylpropan-1-one (MB8) were synthesized. NMR confirmed the presence of the N-H aromatic stretch, in the range  $\delta$  4.00. IR also confirmed the presence of C=O, O-H and N-H typical of the Mannich bases. The Ultra/Violet-Visible absorption spectra for the synthesized compounds revealed that the compounds are aromatic. In vitro antioxidant screening of the compounds by DPPH free radical scavenging method showed that the compounds possessed significant antioxidant activity when compared with standards vitamin C, and butylatedhydroxyanisole (BHA). MB3 (73.56%, 71.17%), MB4 (78.83%, 75.25%), MB5 (73.06%, 70.58%), MB6 (74.55%, 72.47%) and MB8 (78.73%, 74.65%) showed significant inhibition at 1.0 mg/mL and 0.5 mg/mL respectively. MB1, MB2 and MB3 shows potent antimicrobial activity while MB4 – MB8 showed moderate activity, against bacterial and fungal strains when compared with the standards, Gentamicin and Tioconazole for bacteria and fungi respectively. This research work has therefore provided information about the spectroscopic properties, anti-oxidant and antimicrobial activities of new Mannich bases.

### Recent Publications

- Oloyede, G.K., Onocha, P.A. and Oke, J.M. (2011): Mannich Synthesis of 2- (Thiazol-4-yl)-1H-benzimidazole-2-methylene Piperazinyl (2,5 -Diamino-1,3,4- thiadiazolyl) Oxamide and Evaluation of the Filaricidal Activity American-Eurasian Journal of Scientific Research Vol. 6, No. 2, 116-122,
- Oloyede, G.K. , Fisayo-Bambi. E. and Nwachukwu, T. E. (2014)Spectroscopic properties and antimicrobial activity of synthesized Mannich bases: 1-Phenylaminomethyl-naphthalen-2-ol and (2-{ [2 - hydroxy ethyl] amino} methyl}phenyl) phenyl peroxyanhydride American J. of Drug Discovery and Development Vol 4(2), 113-120.
- Oloyede, G. K. and Omisakin, O. O. (2014):Synthesis, ionization constant, toxicity, antimicrobial and antioxidant screening of 1-Phenyl-3-(phenylamino) propan-1-one and Phenyl (2-[phenyl amino)

methyl] phenyl) peroxyanhydride Mannich bases Chemistry and Materials Research Journal Vol 6 (2): 78-91

- Oloyede, G. K., Willie, I. E. and Adeeko, O. O. (2014) Synthesis of Mannich bases: 2-(3-Phenylaminopropionyloxy)-benzoic acid and 3-Phenylamino-1-(2, 4, 6-trimethoxy-phenyl)-propan-1-one, their toxicity, ionization constant, antimicrobial and antioxidant activities. Food Chemistry Journal Vol 165:515-521.
- Oloyede, G. K., Ali, M. S., Lateef M. Anyaele, G. C. and Adeniyi E.M. (2018). Classical and variant approaches to Synthesis of N-Mannich bases of phenyl hydroxyl ketones, their Characterization, Urease inhibition and Antioxidant activities, Journal of Chemistry and Materials Research, 10(5): 6-16

## Biography

Dr Ganiyat K. Oloyede had her PhD in Medicinal/Natural Products Chemistry in 2005 at the University of Ibadan Nigeria where she is currently a Senior Lecturer and PGDE from National Open University of Nigeria (2015). She obtained a Certificate in Conflict Analysis Course (Education and Training Online) from The United State Institute of Peace (2015). A recipient of many awards and member of many professional bodies, she has over 65 published journals to her credit. She has attended many workshops and conferences and delivered papers in fields ranging from food, pharmaceutical and Natural product chemistry both locally and internationally.

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