Available online at www.scholarsresearchlibrary.com

Scholars Research Library

Der Pharmacia Lettre, 2016, 8 (11):140-142
(http://scholarsresearchlibrary.com/archive.html)

Scholars Research Library
ISSN 0975-5071
USA CODEN: DPLEB4

Antifungal, Antibacterial and Antioxidant activities of substituted Morpholinylbenzothiazine

[*] Praveen Kumar Sharma and Chandeep Kaur

Department of Chemistry, School of Physical Science, Lovely Professional University, Phagwara, Punjab, India

---

ABSTRACT

In this study, we have synthesized bioactive N and S containing heterocyclic compounds of probabletherapeutic attention. Synthesized compounds were tested for their antioxidant and antimicrobial activities.

INTRODUCTION

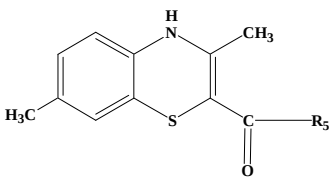
The N- and S- based heterocycles composed an interesting division of heterocycles[1-7]and drawing the attention of the medicinal and synthetic chemists owing to their structural range and biological activities.

The bioactivity of heterocyclic compounds mainly based on the structural specificity and the power of interaction among a receptors and drug present in biological systems. Incurrent work, we synthesized N- and S- containing heterocycles of potential therapeutic interest especially with heterosystems; Morpholine, benzothiazines[8-26], morpholinylbenzothiazines, mainly due to their unique structural features, which make them to show a number of biological and medicinal activities.

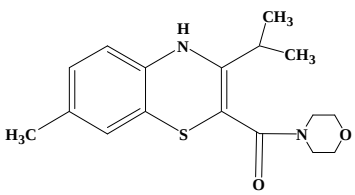
Research methodology
The purity of both synthesized compounds (**a** and**b**) were ensured by TLC using various solvents (non-aqueous). Electric melting point apparatus were used for determination of Melting points.

Synthesis of Morpholinyl-benzothiazine
Compound (**a** and **b**) were synthesized by the use of process present in literature[27].

a. 3,7-dimethyl-2-(4'-morpholinylcarbonyl)-4H-1,4-benzothiazine
b. 3- isopropyl -7-methyl-2-(4'-morpholinylcarbonyl)-4H-1,4-benzothiazine



a



b

Antimicrobial activity: The media utilize for this function are Nutrient agar media and potato dextrose media. Both synthesized compounds (a and b) were inspected for their biological activity aligned with bacterial and fungal strains.

Media preparation: - Potato dextrose agar (39g) and Nutrient agar (28g) was added to the 1 liter of water (double distilled) alone and mixed systematically and pH was regulated at 7.5 ± 0.2. Increase the temperature of solution to dissolve the component totally than for 45 minutes media was autoclaved at 121^{o}C at 15lbs pressure. After that 15-20 ml of autoclaved media was added into petri dish for learning antimicrobial activities.

Method and Material required: - The anti-microbial activity tests were conducted against fungal species *Aspergillus fumigatus*(NCIM no 902) and bacterial species *Salmonella typhimurium*(NCIM no 2501) by the use of standard literature reported procedure related to disk-diffusion method[28]. Disks (Whattman no. 1 filter paper) were sterilized by autoclaving at 160^{0}C for one hour. Then the sterile disks were soaked with the examine compounds of different concentrations. Cultures having 10^{5}CFU per mL were used beside each concentration levels. The saturated disks were positioned on the medium separated from each other, and the plates were developed at 37^{0}C for 24 h for bacterial species and 28^{o}C for fungal species. Methanol was used as control and the zones of inhibition were considered in mm scale. Experiment materials (Media culture) were arranged from NCIM Pune (India).The results of antimicrobial activities are précised in **table 1, 2 and 3.**

RESULTS AND DISCUSSION

Both the synthesized compounds **a** and **b** were monitored for antimicrobial activity against different microbial species. Both the compounds confirmed antibacterial activities at different concentrations. Compounds **a** exhibit antifungal activity at different concentrations but **b** not exhibit antifungal activity. Result given in **table 1, 2 and 3.**

Table:-1 Antimicrobial activities of compound (a andb).

Compounds	Bacterial species(*Salmonella typhimurium*) (Zone of inhibition in mm)					
	0ppm	62.5ppm	125ppm	250ppm	500ppm	1000ppm
a	X	2mm	3mm	3mm	3mm	4mm
b	X	3mm	3mm	3mm	4mm	5mm

Table:-2 Antibacterial activities of Standard antibacterial drugs.

Compounds/Concentration	(Zone of inhibition in mm)
Cefotaxime (CTX)/30ppm	2mm
Erythromycin (E)/15ppm)	15mm
Clindamycin (CD)/2ppm)	12mm
Amoxyclav /(30ppm)	0mm
Gentamycin/(10ppm)	10mm

Table:-2 Antifungal activities of compound (a).

Compounds	Fungal species (*Aspergillus fumigatus*) (Zone of inhibition in mm)					
	0ppm	62.5ppm	125ppm	250ppm	500ppm	1000ppm
a	X	3mm	3mm	3mm	4mm	5mm

Antioxidant activities

Preparation of Sample required for the antioxidant activity of compound (a and b)

DPPH and compounds (a and b)solution (125ppm) was prepared with methanol. Then add 4ml of DPPH solution in 100 microliter of compound **a** and **b** sample solution separately. Determine the wave length of both of the sample solution independently by UV.

Calculation of Antioxidant activities

Formula used for calculation of anti-oxidant activities

Inhibition percentage =$(control - sample) \div control.$

Control = Absorbance for DPPH solution

Sample = DPPH+ sample

Compound (a)
Absorption (Control) at 517nm= 1.17522
Absorption (Sample) at same wavelength= 1.04150
Inhibition percentage = 11.37%

Compound (b)
Absorption (Control) at 517nm= 1.17522
Absorption (Sample) at same wavelength= 0.61667
Inhibition percentage = 47.527%

CONCLUSION

On the basis of above work Morpholinylbenzothiazines are fixed as chief class in heterocyclic compounds and their consequence are demanding in various diseases based on different verity of infections. Above work fixed that both the synthesized compounds (Sample a and b) exhibit antimicrobial activity against microbes as well as both compound illustrated antioxidant activity by DPPH method.

REFERENCES

[1] RR Gupta; "Heterocyclic Chemistry". **1999**; Vol. II, Springer-Verleg, Germany.
[2] RR Gupta; M Kumar; Gupta, V. "Heterocyclic Chemistry". **1998**; Vol. I, Springer-Verleg, Germany.
[3] RR Gupta; M Kumar; "Synthesis, Reactions and Properties of Phenothiazines" in "Phenothiazines and 1, 4 Benzothiazines" (Chemical and Biomedical Aspects).;**1988** Eds.: Elsevier, Amsterdam, pp. 1-161.
[4] CH Collins; "Microbiological Methods, Butterworths".**1968** London, p 364
[5] PK Sharma; M Kumar; *Res ChemIntermed* **2010**; 36(8):985-993.
[6] JJ Matysiak; *Bioorg Med Chem*.**2006**; 14; 2613.
[7] PK Sharma; M Kumar; *Res ChemIntermed* **2009**;35:35-41
[8] PK Sharma; M Kumar: *Res.Chem.Intermed*.**2015**; 41;6141-6148
[9] KR Cruickshank;" Medical Microbiology, A Guide to Diagnosis and Control of Infection". E.S. Livingston Ltd., Edinburgh and London **1968** vol. 2nd Eds.
[10] PK Sharma; *Journal of Chemical and Pharmaceutical Research* **2015**;7(11):462-473
[11] PK Sharma; *Journal of Chemical and Pharmaceutical Research* **2015**;7(3):819-822
[12] R Fringuelli; F Schiaffella; *Bioorg Med Chem*.**2002**; 10; 3415.
[13] R Fringuelli; F Schiaffella; *Review. J Chemother*. **2001**; 13; 9.
[14] BS Rathore; M Kumar; *Bioorg Med Chem*.**2006** 14; 5678.
[15] PK Sharma; *Der Pharma Chemica*, **2016**, 8(5):191-193
[16] PK Sharma; *Der Pharmacia Lettre* **2016**;8 (4):86-90
[17] PK Sharma; *Journal of Chemical and Pharmaceutical Research* **2015**;7(2):133-139
[18] VV Dabholkar; AKarekar; *Journal of Chemical, Biological and Physical Sciences*, **2013**; 3(3); 1690-1696.
[19] PK Sharma; *Journal of Chemical and Pharmaceutical Research* **2015**;7(1):710-714
[20] PK Sharma; M Kumar; *Synth Commun* **2010**; 40(16):2347-2352.
[21] PK Sharma; M Kumar; *Hetrocycl Commun* **2009**;15,(2):127-133
[22] CS Damanjit; *Pharmacophore*, **2013**;, 4(3); 70-88.
[23] I Yavari; Monatsheftefür *Chemie-Chemical Monthly*, **2010**; 141(2); 229-232.
[24] PK Sharma; M Kumar; *Hetrocycl. Commun* **2008**;14(3):155-160
[25] PK Sharma; *Res.Chem.Intermed*;37(8),1103-1111, **2011**
[26] SP Rathod.;APCharjan; *RasayanJ.Chem*., **2010**; 3(2); 363-367.
[27] PK Sharma; *Med. Chem. Res*., 21(8),2072-2078, **2012**
[28] NK Jain; MK Chourasia; *Indian J Pharm Sci* **2003**; 65: 113–121