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Newer Heterocyclic Molecules Act as Antifungal

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ABSTRACT

Benzimidazoles and pyrazole are heterocyclic compound which have shown potential for application in a variety of pharmacological targets. They are of wide interest because of their diverse biological activity and clinical applications. Biologically active benzimidazoles and pyrazole have been known for a long time and they can act as bacteriostats or bactericides, as well as fungicides. This rings system was proved to be very important as it is involved in numerous antiparasitic, antitumoral and antiviral drugs. It is also well known that these molecules are present in a variety of antioxidant and anti allergic agents. Many derivatives of benzimidazole as well as pyrazole show antiparasitic and antiprotozoal activities.

KEYWORDS: Benzimidazole, Pyrazole, antiparasitic, antitumoral and antiviral drugs, bactericides, fungicides

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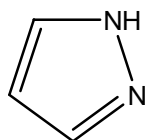
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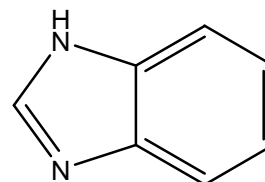
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INTRODUCTION

Drugs are chemicals that prevent disease or assist in restoring health to the diseased individuals as such they play an indispensable role in modern medicine. Heterocyclic compounds having five or six member ring with at least one hetero atom as the ring member, that are relatively stable and exhibit aromatic character.¹



Pyrazole



Benzimidazole

Benzimidazoles and pyrazole are heterocyclic compound which have shown good for use in a variety of pharmacological targets. They are of wide interest because of their different biological activity and clinical applications. Benzimidazoles and pyrazole have been known for a long time and they can act as antibacterial and antifungal. This rings system was proved to be very important as it is involved in numerous antiparasitic, antitumoral, antiinflammatory as well as antiviral drugs. It is also well known that these molecules are present in a variety of antioxidant and anti allergic agents. Many derivatives of benzimidazole and pyrazole show antiprotozoal activities.^{1,2,3,4,5,6,7,8}

Benimidazole: Molecular formula is $C_7H_6N_2$, Molecular weight is 118 gm/mol and Pk_a Value is 12.8.

Pyrazole: Molecular formula is $C_3H_4N_2$, Molecular weight is 68 gm/mol and Pk_b Value is 11.5.

NEWER HETEROCYCLIC MOLECULES⁹

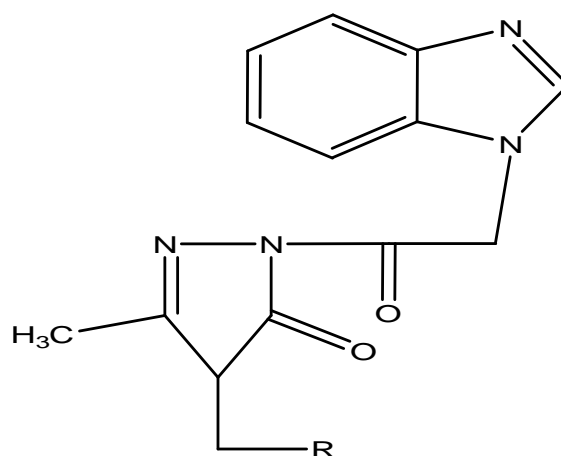
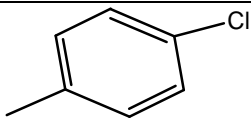
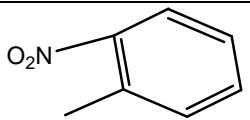
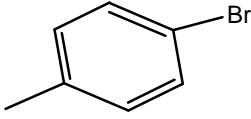
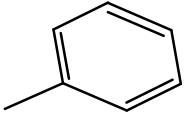
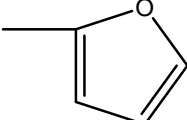
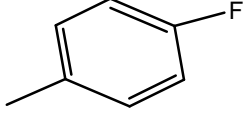
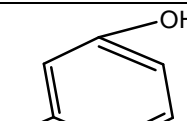
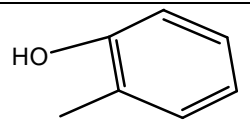
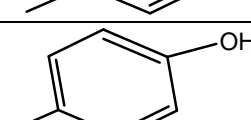
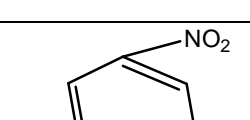


Table-1 Series of molecules

Comp. No.	-R	Comp. No.	-R
1		2	
3		5	
6		7	
8		9	
10		11	

ANTIFUNGAL ACTIVITY¹⁰

Organisms Used: A.flavus (871), A.fumigatus (2250), A.fumigatus (2250) C.albidus (2661) and C.albicans (183)

Chemicals Used: RPMI (Rosewell Park memorial institute)-1640 medium, Glutamine, Phenol red, 3-(N-morpholino) propanesulfonic acid (MOPS) and Sodium hydroxide

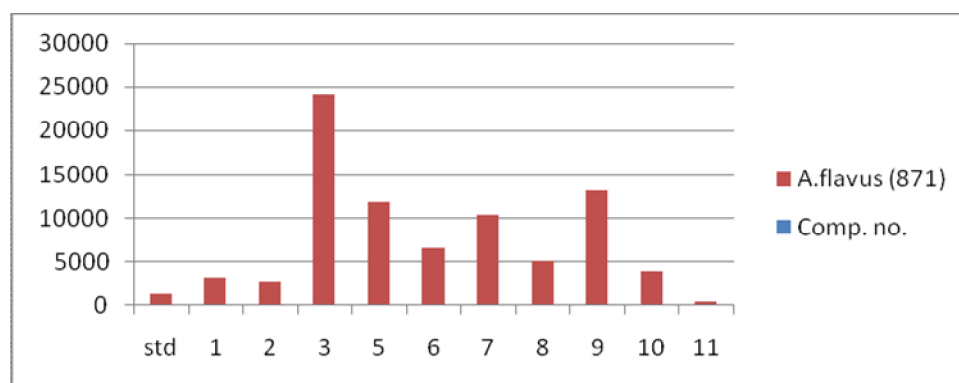


Figure-1 Graph-I for the IC₅₀ of all compound against A. flavus (871)

From the graph I conclude that compound 11 and compound 2 gives better activity against A.flavus (871). whereas compound 11 gives better activity then compound 2 because it contain nitro

group at m position with giving stable compound compare to compound 2 contain nitro group at o position.

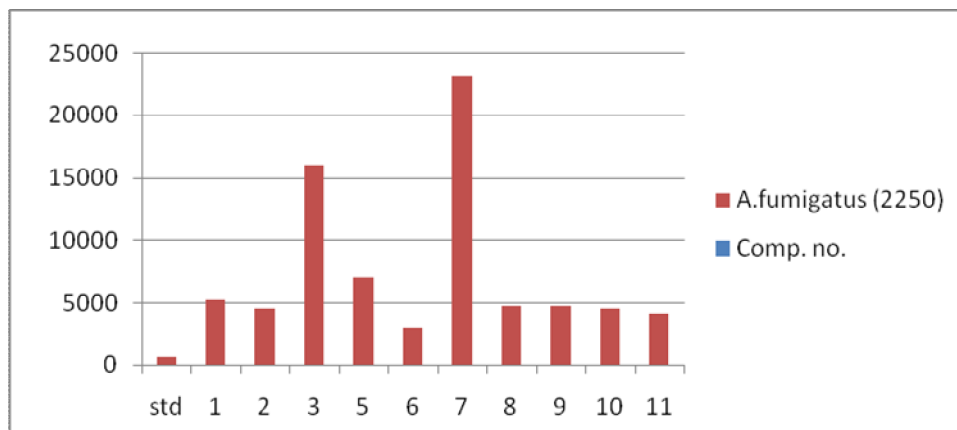


Figure-2 Graph-II for the IC50 of all compound against A.fumigatus (2250)

From the graph II we conclude that compound 11 and compound 2 gives better activity against A.fumigatus (2250). Whereas compound 11 gives better activity then compound 2 because it contain nitro group at m position with giving stable compound compare to compound 2 contain nitro group at o position.

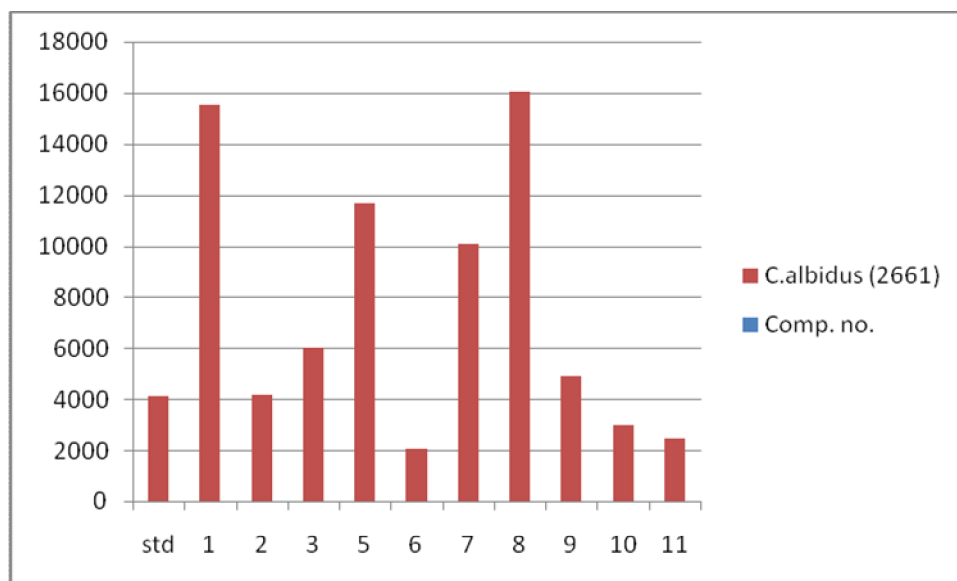


Figure-3 Graph-III for the IC50 of all compound against C.albidus (2661)

From the graph-III we conclude that compound 11 and compound 6 gives better activity against C.albicans (2661). Whereas compound 6 gives better activity then compound 11 because it contain furan moiety were compound 11 contain m-nitro benzene.

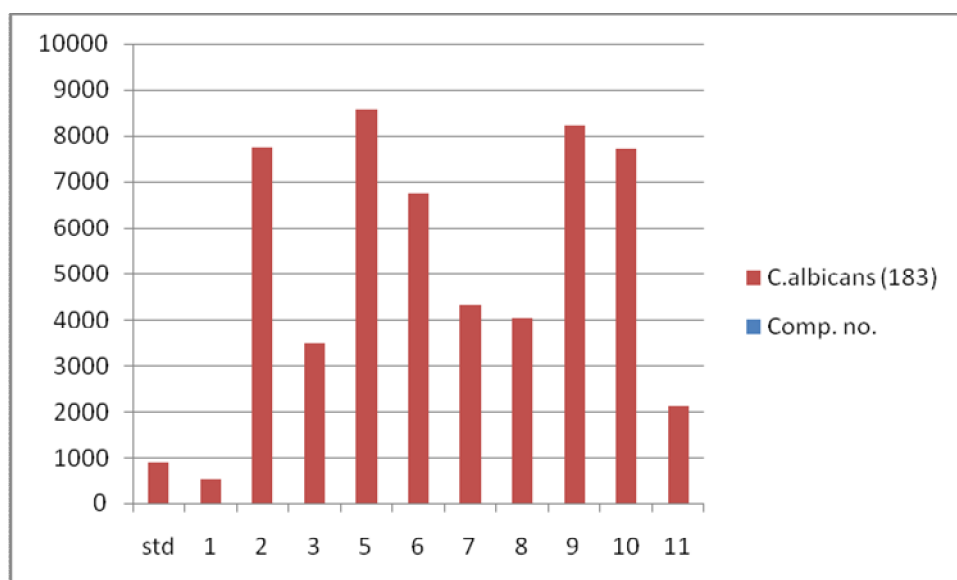


Figure-4 Graph-IV for the IC₅₀ of all compound against C.albicans (183)

From the graph-IV we conclude that compound 1 gives better activity against C.albicans (183). Compound 1 contains p-chloro benzene with stable structure.

CONCLUSION

From the graph-I-IV we conclude that compound 11 gives better activity against A.flavus (871), A.fumigatus (2250) and C.albicans (2661). Whereas compound 1 gives better activity against C.albicans (183).

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