ANTIMICROBIAL ACTIVITY OF THIAZOLIDINONES DERIVATIVES OF 2-AMINO THIOPHENES

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Summary

The present study is done to evaluate antimicrobial activity of some novel thiazolidinones derivatives of 2-amino thiophene. All the synthesized compounds were subjected to antimicrobial screening involving two bacterial strains *Escherichia coli* and *Streptococcus pneumoniae* and two fungal strains *Pseudomonas aeruginosa* and *Candida albicans* using Ampicillin as standard at the same concentration. The results were compared with that of standard drug. All the synthesized compounds have shown low to moderate activity against standard drugs.

Keywords: Thiazolidinone, Antibacterial Activity, Antifungal Activity.

Introduction

Substituted thiophenes and their biheterocycles have received considerable attention during last two decades as they are endowed with wide range of therapeutic properties. A number of thiophene derivatives and Schiff bases have been reported to possess significant and diverse biological activities such as analgesic (1), antibacterial (2), antifungal (3), antioxidant & anti-inflammatory (4), anticancer activity (5) and local anesthetic activity (6). Thiophene can be fused with various heterocyclic nuclei giving rise to newer compounds having enhanced biological activities. Thienopyrimidines occupy special position among these compounds. Many of these derivatives exhibit antiallergic (7), antibacterial (8), antidepressant (9), antidiabetic (10), analgesic and anti-inflammatory (11) activities. In present study, a novel series of 2-amino thiophene was synthesized adopting Gewald Reaction (12) and were screened for antibacterial activity and antifungal activity.

Materials and Methods

In our current study, the antimicrobial activity was carried out by the Agar disc diffusion method (13). Here responses of organisms to the synthesized compounds were measured in terms of zone of inhibition and compared with the response of the standard drug.

All the synthesized compounds were subjected to antimicrobial screening at a concentration of 100µg/ml involving a Gram-ve bacteria *Escherichia coli*; a Gram+ve bacteria *Streptococcus pneumoniae* and two fungal strains *P. aeruginosa* and *C. albicans*. The standard drug used in the present work was Ampicillin.

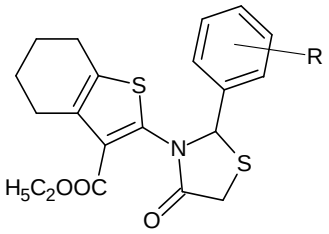
Mueller Hinton Agar Media was used for antimicrobial screening and its composition is as follows:

Casein Acid Hydrolysate	17.50gm
Beef Heart Infusion	2.00gm
Starch, soluble	1.50gm
Agar	17.00gm
Distilled water	1lt.

Inoculums were added to the prepared media plates and allowed to solidify. The previously prepared discs of synthesized derivatives were carefully kept on the solidified media by using sterilized forceps. These petridishes were kept for one- hour diffusion at room temperature and then for incubation at 37°C for 24 hours in an incubator. The zones of inhibition after 24 hours were measured in millimeters.

Results and Conclusions

The antimicrobial activity of some novel thiazolidinones derivatives of 2-aminothiophes were studied by employing Agar disc diffusion method against two bacterial and two fungal strains at 100 µg/ml using Ampicillin as a standard drug. The results of antimicrobial activity are shown in Table.



RSB_1- RSB_6

Sample	Structure	*E. coli*	*S. pneumoniae*	*P. aeruginosa*	*C. albicans*
RSB_1	2-OH	-	10	9	13
RSB_2	4-OCH_3	13	15	8	13
RSB_3	3,4-OCH_3	14	13	13	14
RSB_4	4-$N(CH_3)_2$	10	13	11	11
RSB_5	4-Cl	12	13	12	11
RSB_6	H	11	11	8	9
Ampicillin		22	22	19	21
DMF		-	-	-	-

Antimicrobial Activity of synthesized thiazolidinones (RSB_1- RSB_6)

From the screening results it was observed that the presence of electron withdrawing group and ester linkage made the compounds to exhibit moderate to significant activity in comparison to standard drug Ampicillin. Compound RSB_4 which is having a dimethyl amino substitution on benzene ring has shown best activity as when compared to other derivatives. However other compounds of the series also exhibited moderate to significant activity against the microorganisms as mentioned above. The above results established the fact that thiophene substituted with various aldehydes (substituted) can be studied further to explore out newer antimicrobial compounds.

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