RESULTS AND DISCUSSION

On the basis of the results obtained during the screening of various compounds (series I-V) for their antimicrobial activity against various gram (+ve) and gram (-ve) bacteria, the following conclusion could be drawn.

Series-I (Compounds IIa - VIa)

The compounds of series-I (IIa-VIa) were tested against gram +ve and gram -ve bacteria and the activity was measured in terms of zone of inhibition and it has been found that these compounds are active against gram +ve than gram -ve bacteria. The moderate growth inhibitor activity has been observed against Staph. aureus and Staph. albus while less activity against Staph. citreus. Only the compounds IVa, VIa were found to be moderately active against E. coli and P. aerugenosa bacteria respectively. The compounds IIIa was found to be less active against E.coli. All the compounds of this series were found to be inactive against K.pneumoniae.

Series - II (Compounds IIb - VIb)

Some of the compounds of this series exhibited moderate activity against gram +ve bacteria while no activity against gram -ve bacteria except the compound IVb. The compound IVb showed moderate antibacterial activity against Staph. citreus (+ve); Staph. aureus (+ve) and P. aerugenosa (-ve) bacteria. The compound IIb, Vb and VIb were found to be less active against Staph. citreus. While no activity against Staph. aureus except IIb which is found less active against the same type.

Series - III (Compounds IIc - VIc)

The compounds of this series in general are found to be inactive against gram (-ve) except compound IIIc which exhibited strong antibacterial activity against same species and less activity against gram (+ve) Staph. aureus and Staph. albus bacteria. The compound IVc exhibited less activity against Staph. citreus and Staph. aureus. The moderate activity has been observed in the case of compound VIc against Staph. citreus which exhibits less activity against E. coli (-ve).

Series IV (Compounds IId - VId)

Some of the compounds of this series exhibited moderate antibacterial activity against gram (+ve) as well as gram (-ve) bacteria. The compounds IVd and VId showed moderate activity against Staph. citreus(+ve) P. aerugenosa and E. coli (-ve) bacteria. Compound IId was moderately active against P. aerugenosa (-ve) while less active against Staph. citreus. Compound Vd was active moderately against E. coli (-ve) and Staph. albus (+ve) while inactive against other types of bacteria. Compound VId exhibited considerable activity against Staph. citreus, E. coli, P. aerugenosa and K. penunoniae.

In comparison among these series (I to IV) of the compounds the triazoles, oxadiazoles and thiadiazoles of N_{10}-substituted phenothiazine are found to be good antibacterial agents than corresponding thiosemicarbazides and hydrazides.

Series V (Compounds I_f - I_i)

In this series of the compounds sulphonimido moiety is attached to phenothiazine nucleus at N_{10}-position. All the compounds of this series have been found to be active against Staph. citreus and P. aerugenosa bacteria. Compound I_h and I_i are found to be more active against most of the gram +ve and gram -ve bacteria except Staph. albus.

In comparison with the compounds among the series, the alkyl substituent on the benzene ring of sulphonamido moiety slightly decreases the antibacterial activity perticularly at 2- and 3- positions with respect to sulphonamido group.

In comparison with N_{10}-substituted sulphonamido and N_{10}-heterocyclic phenothiazines; the sulphonamide derivatives are as potent as the triazole, oxadiazole and thiadiazole derivatives of the N_{10}-phenothiazine. Hence all of them have considerable medicinal value.