Results and Discussion

Antibacterial Activity

The antibacterial activity of various pyrimidine and quinoline derivatives has been reported and therefore it was thought interesting to club both the moieties with an object of ascertaining whether they show either additive antibacterial effect or mutually opposing effect or partial activity is retained.

The antibacterial activity of 4-(substituted phenyl)-6-(substituted phenyl)-2-pyrimidinamine (A-17 to A-32), N4-[4,6-diaryl substituted phenyl-2-pyrimidinyl]-substituted-4-quinolinamine (A-37 to A-100) and the compounds (A-101 to A-112) obtained by condensing 4-(substituted phenyl)-6-(substituted phenyl)-2-pyrimidinamine with cold brand reactive dye was carried out using the following organisms.

- *Escherichia coli* [Gram negative] MTCC – 443
- *Pseudomonas aeruginosa* [Gram negative] MTCC – 424
- *Staphylococcus aureus* [Gram positive] MTCC – 96
- *Streptococcus Pyogenes* [Gram positive] MTCC – 442

The results of these compounds showing antibacterial activity against gram positive and gram negative bacteria are given in Tables-37 to 42.
The results indicate the bacteriostatic effect of the parent 4-(substituted phenyl)-6-(substituted phenyl)-2-pyrimidinamine (A-17 to A-32). It appears that all the compounds are active against selected bacteria and show appreciable antibacterial activity against the selected organisms. It is evident from the results that the compound A-18 and A-24 show maximum activity against all the selected organisms.

It is evident from table-38 that the highest antibacterial activity is exhibited by the compound A-38 against all the test organisms. Almost all the compounds show appreciable activity against all the test organisms.

Comparing the antibacterial activity of these compounds with the parent compounds (A-17 to A-32), it is seen that in most of the compounds the antibacterial activity is increased. It is surprising to note that the compound A-46 and A-48 show appreciable additive antibacterial activity against the test organisms. Surprisingly the compound A-43 and A-51 show decrease in antibacterial activity against the test organisms.

The results indicate that the highest antibacterial activity is exhibited by the compounds A-54 and A-60 against all the test organisms. It also appears that all the compounds are active against the test organisms selected.

Comparing the antibacterial activity of these compounds with the parent compounds (A-17 to A-32), it is seen that in most of the compounds antibacterial activity is increased. The compound A-62 and A-63 show appreciable additive
antibacterial activity against all the test organisms. Surprisingly the compound A-67 shows decrease in antibacterial activity against all the test organisms.

**TABLE-40**

It would be seen from table-40 that the highest antibacterial activity is exhibited by the compound A-70 and A-76 against all the test organisms.

Comparing the antibacterial activity of these compounds with the parent compounds (A-17 to A-32), it would be seen that the compound A-78 shows fairly good additive antibacterial activity against Gram positive bacteria while compound A-72 and A-74 towards *Pseudomonas aeruginosa* and *Escherichia coli* respectively. It is surprising to note that the compounds A-75, A-82 and A-83 show decrease in antibacterial activity against all the test organisms.

**TABLE-41**

The results indicate that the highest antibacterial activity is exhibited by the compounds A-86, A-87 and A-89 against all the test organisms.

Comparing the antibacterial activity of these compound with the parent compounds (A-17 to A-32), it is found that the compounds A-94 and A-95 show appreciable additive activity against Gram positive bacteria while the compound A-85 towards Gram negative bacteria and compound A-88 and A-90 towards *Pseudomonas aeruginosa* and *Escherichia coli* respectively. Surprisingly the compound A-91, A-93 and A-99 show decrease in antibacterial activity against all the test organisms.

**TABLE-42**
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It is evident from the table-42 that surprisingly all the compounds (A-101 to A-112) do not show any antibacterial activity against all the selected test organisms.

Most of the products employed for experimentation show the bacteriostatic activity. The effect of these products on different four organisms is not uniform. Each product has its specific maximum or minimum bacteriostatic effects depending upon the specific species of the bacteria. For the sake of brevity, the effect of each product is explained in a consolidated form.

As seen from the above discussion, each product acts differently over specific species of bacteria as far as its bacteriostatic effect is concerned. Choice regarding specific product as most effective for particular species has been limited under such condition; because physical property such as rate of diffusion of each chemical in the medium may differ and hence such conclusion may be erroneous.
Antifungal Activity

Most of the pyrimidine and quinoline derivatives show antifungal activity against different fungi. Therefore, these compounds were also screened for their antifungal activity.

The fungi selected were,

1) Aspergillus niger
2) Candida albicans

The results of these compounds showing antifungal activity are given in table-43 to 48.

TABLE-43

The data presented in table-43 shows the antifungal activity of the parent compound 4-(substituted phenyl)-6-(substituted phenyl)-2-pyrimidinamine. It appears that all the compounds are active against selected fungi. The highest antifungal activity is exhibited by compound A-24 against C. albicans and A. niger. The lowest antifungal activity is exhibited by compound A-17 (A. niger) and A-32 (C. albicans)

TABLE-44

It is evident from table-44 that the highest antifungal activity is exhibited by compound A-44 against both the fungi and compound A-39 against A. niger. It also appears that all the compounds show variable antifungal activity.
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Comparing the antifungal activity of these compounds with the parent compounds (A-17 to A-32), it is found that compound A-39 and A-50 show fairly good additive antifungal activity against both fungi. In most of the compounds the antifungal activity is moderately increased decreased or retained.

**TABLE-45**

It would be seen from the table-45 that the highest antifungal activity is exhibited by compound A-57, A-64 against *C. albicans* and A-54 against *A. niger*. It also appears that the rest of the compounds show variable antifungal activity.

Comparing the antifungal activity of these compounds with the parent compounds (A-17 to A-32), it appears that the compound A-59 show significantly additive antifungal activity against both fungi. It is surprising to note that A-58, A-61 and A-65 show decrease in antifungal activity against both fungi.

**TABLE-46**

The data presented in table-46 indicates that the highest antifungal activity is exhibited by the compounds A-70 against both the fungi while A-73 and A-76 against *C. albicans*.

Comparing the antifungal activity of these compounds with the parent compounds (A-17 to A-32), it appears that compound A-84 show appreciable additive antifungal activity against both fungi. Surprisingly the compounds A-77, A-81 and A-83 show decrease in antifungal activity.

**TABLE-47**

It is evident from table-47 that the highest antifungal activity is exhibited by the compounds A-86 against both fungi and A-89 against *C. albicans*. 
Comparing the antifungal activity of these compounds with the parent compounds (A-17 to A-32), it is seen that compound A-95 show significant additive antifungal activity against both fungi. It is surprising to note that the compound A-92, A-93 and A-99 show decrease in antifungal activity.

**TABLE-48**

It is evident from the table-48 that surprisingly all the compounds (A-101 to A-112) do not show any antifungal activity against all the selected fungi.

Most of the products employed for experimentation show the antifungal activity. The effect of these products on both the fungi is not uniform. Each product has its specific maximum or minimum antifungal activity depending upon the specific species of the fungi. For the sake of brevity, the effect of each product is explained in a consolidated form.

As seen from the above discussion, each product acts differently over specific species of fungi as far as its antifungal activity is concerned. Choice regarding specific product as most effective for particular species has been limited under such condition; because physical property such as rate of diffusion of each chemical in the medium may differ and hence such conclusion may be erroneous.