International Journal of Advanced Research in Chemical Science (IJARCS)
Volume 1, Issue 1, March 2014, PP 70-86
www.arcjournals.org

Synthesis, Characterization & Antimicrobial Activities of Substituted 2, 5-Disubstituted Phenyl-6-Substituted Phenyl Sulfonamide / Azomethine / Azo / Phenylthiourea-Pyrimidines

Meghasham N. Narule
Vidya Vikas Art, Commerce & Science College,
Samudrapur, Dist-Wardha, Maharashtra, INDIA.
meghasham_n@rediffmail.com

Abstract: *Synthesis of substituted 2, 5-Disubstituted phenyl-6-substituted phenyl sulfonamide-pyrimidines **(2a-m)**, 2, 5-Disubstituted phenyl-6-substituted Azomethine-pyrimidines **(3a-m)**, substituted 2, 5-Disubstituted phenyl-6-azo-pyrimidines **(4a-m)**, substituted 2, 5-Disubstituted phenyl-6-N-phenylthiourea-pyrimidines **(5a-m)** from 2, 5-Disubstituted phenyl-6-amine-pyrimidines **(1a-m)** is reported in this paper. The structures of synthesized **products have been characterized on the basis of FT-IR, ^{1}HNMR, FAB-MS and elemental analysis. The** title compounds are found to have antibacterial and antifungal activities.*

Keywords: *Sulfonamide, Azomethine, Phenylthiourea, Pyrimidines, etc.*

1. INTRODUCTION

Heterocyclcs are their analogs in which one or more ring carbons have been replaced by a heteroatom, such as nitrogen, oxygen, sulfur, phosphorus, silicon, a metal, and so on. The most-common heterocyclic systems contain nitrogen or oxygen or both. The Chemistry of heterocyclic compounds is a vast subject and it is not possible to discuss whole of them. Heterocyclic compounds have played an important role in the evolution of life, as dyes, drugs and are also used in many commercially important species. Nitrogen and oxygen containing heterocyclic compounds have received considerable attention due to their wide range of pharmacological activity. The pyrimidine derivatives have been reported to possess a variety of biological activity, notable among which are the analgesic[1], antihypertencive[2], antipyretic[3], antiviral[4] and anti-inflammatory activity[5]. These are also associated with nucleic acid, antibiotic, antimalarial and anticancer drugs[6]. Many of the pyrimidine derivatives are reported to possess potential CNS depressant properties[7]. Pyrimidines are of great importance in fundamental metabolism[8-11], that is uracil, thiamine and cytosine the important bases found in the nucleotide. Many derivatives of pyrimidines have been used as therapeutic agents and possess analgesics and anti-inflammatory activity. It is used as calcium channel blockers. 4-Amino-5-oxopyrido [2, 3-d] pyrimidines riboside was found to be very potent inhibitors of cancer cell proliferation. Pyrimidine ring is present in the large number of biologically important compounds[12-15] such as alkaloids, drugs, agrochemicals or antimicrobial agents and, since the early years of this century numerous studies on the synthesis and structure- activity relationship of pyrimidine derivatives have been reported. Pyrimidine is a class of chemical compound exhibits antibiotic activity. They inhibit the activity of bacterial forms of some enzymes in a stronger way than the human forms and therefore kill bacteria[16-18].

2. RESULT AND DISCUSSION

In view of these observations, it was thought worthwhile to synthesize several compounds in which 2, 5-Disubstituted phenyl-6-amine-pyrimidines**,** 2, 5-Disubstituted phenyl-6-substituted phenyl sulfonamide-pyrimidines,2, 5-Disubstituted phenyl-6-substituted Azomethine-pyrimidines and substituted 2, 5-Disubstituted phenyl-6-azo-pyrimidines have been linked with new moiety

The reaction sequence leading to the formation of desired heterocyclic compounds are outlined in **Scheme-I**. The starting material 2, 5-Disubstituted phenyl-6-amine-pyrimidines **(1a-m)** was prepared by the reaction of substituted chalcones with guanidine carbonate in presence of ethanol.

Synthesis of substituted 2, 5-Disubstituted phenyl-6-substituted phenyl sulfonamide-pyrimidines **(2a-m)** by reaction of 2, 5-Disubstituted phenyl-6-amine-pyrimidines **(1a-m)** with different sulphonil chlorides in presence of ethanol. The substituted 2, 5-Disubstituted phenyl-6-substituted-azomethine-pyrimidines **3(a-m)** was prepared by condensation of 2, 5-Disubstituted phenyl-6-amine-pyrimidines **1(a-m)** with different aldehydes. The compound **1(a-m)** which on coupling with different aromatic hydroxyl compounds in presence of $NaNO_2$ and HCl at 0-5^{0}C yielded substituted 2, 5-Disubstituted phenyl-6-azo-pyrimidines **(4a-m)**. Synthesis of substituted 2, 5-Disubstituted phenyl-6-N-phenylthiourea-pyrimidines **5(a-m)** by the reaction of phenyl thio-cyanide with 2, 5-Disubstituted phenyl-6-amine-pyrimidines. The UV-Vis-spectra of the azo dyes **(4a-m)** were recorded and the values of absorptions (λ max) and fastness properties are shown in **Table –I**. It is apparent that the wavelength of maximum absorptions azo compound was observed at 200-500nm in EtOH solutions. Variation in λmax is being attributed to structural variation of electron–rich aromatic compounds with N=N linkage used for the preparation of these azo compounds.

Table I. *UV-VIS Section of Azo compound (4a –m) and colour fastness properties.*

Code	Colour	max	Fastness properties			
			Silk		Wool	
			Light[a]	Wash[b]	Light[a]	Wash[b]
4a	Red	475	4	3	2-3	3-4
4b	Brown	456	3-4	2-3	3-4	2
4c	Red	442	2	4	2	3
4d	Brown	411	2-3	3-4	2-3	2-3
4e	Red	422	4	2-3	3	3-4
4f	Orange	445	2-3	3-4	2-3	2-3
4g	Red	470	3-4	2-3	3-4	2
4h	Red	474	2	4	3	3-4
4i	Red	473	2	2-3	3-4	4
4j	Orange	457	3-4	3	2-3	2-3
4k	Red	420	2	3	4	2-3
4l	Purple	483	4	3-4	2-3	3
4m	Orange	437	3-4	4	3-4	2-3

- IN EtOH solution (4a-m)
- Light-fastness: 1-minimum, 2-poor, 3-moderate, 4-fairly good, 5-good, 6-very good.
- Wash-fastness: 1-Poor, 2-fair, 3-good, 4-very good and 5-excellent.

3. BIOLOGICAL ACTIVITIES

Comparative study of 2, 5-Disubstituted phenyl-6-amine-pyrimidines **(1a-m)** and 2, 5-Disubstituted phenyl-6-substituted phenyl sulfonamide-pyrimidines **(2a-m)**, 2, 5-Disubstituted phenyl-6-substituted Azomethine-pyrimidines **(3a-m)**, substituted 2, 5-Disubstituted phenyl-6-N-phenylthiourea-pyrimidines **(5a-m)** have been observed by using Norfloxacine and Griseofulvine as standards. The enhancement in biological activity of compound as compared with the newly synthesized has been observed. The synthesized compounds were tested at 100g/ml concentration against *Escherichia coli, Staphylococcus aureus, Ps. acruginosa*, *P.vulgaris*, *A. niger* and *C. albicans* for its antibacterial and antifungal screening as shown in **Table-I**.

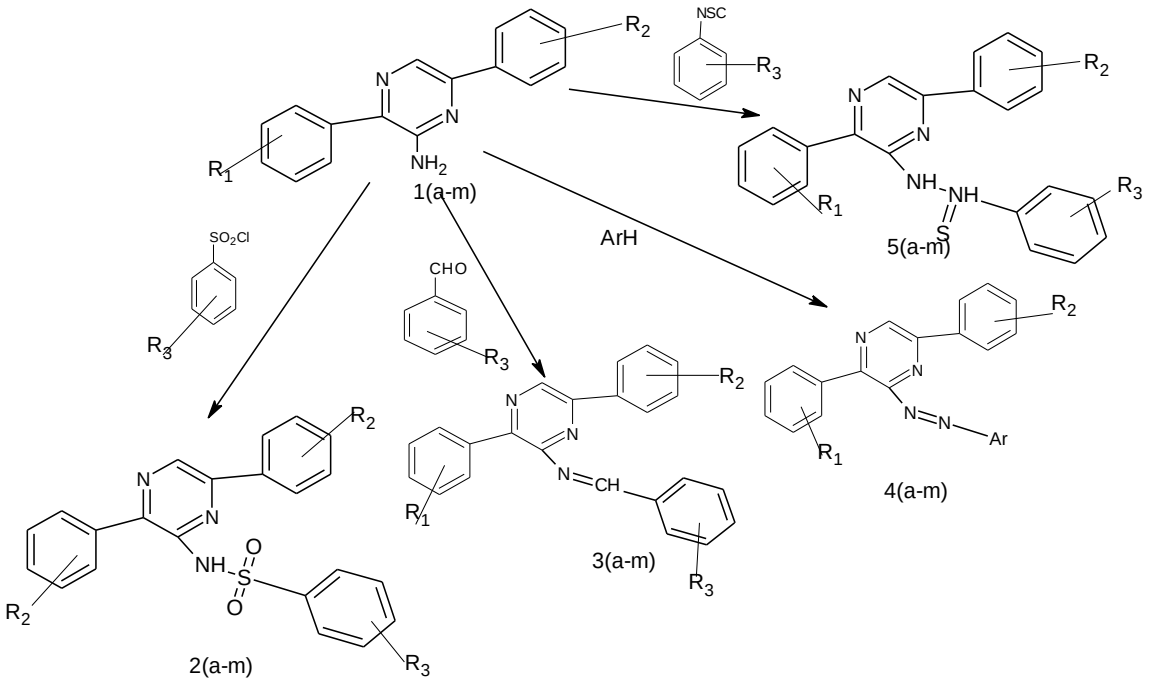
Table – I – Data for in vitro antibacterial and anti Fungal activities (in mm) (NA=not active**, --=**no inhibition of growth **)**

Comp.	**Minimum inhibitory concentration's g/ml**					
	E. *Coli*	**S. *aurous***	**Ps. *aeruginoa***	**P. *Vulgaris***	**A.*niger***	**C. *albicans***
2a	14	10	15	14	16	15
2b	11	15	10	12	22	12
2c	16	10	11	13	19	NA

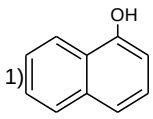
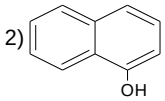
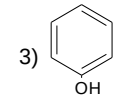
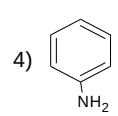
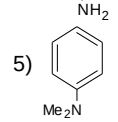
2d	13	9	10	11	17	NA
2e	14	12	13	16	12	22
2f	15	11	16	9	15	21
2g	9	13	11	17	16	17
2h	17	10	5	8	NA	11
2i	12	9	16	10	18	NA
2j	17	15	15	14	12	18

2k	18	10	15	14	16	15
2l	11	9	10	12	22	12
2m	16	10	11	13	19	NA
3a	18	10	15	14	16	15
3b	11	9	10	12	22	12
3c	16	10	11	13	19	16
3d	13	22	10	11	17	16
3e	14	12	13	17	12	22
3f	15	11	23	9	-	21
3g	9	22	13	16	16	13
3h	15	10	5	8	NA	11
3i	12	9	16	10	18	17
3j	17	7	-	14	12	16

3k	-	10	15	14	16	15
3l	11	9	10	12	22	12
3m	-	10	15	14	16	15
5a	11	9	10	12	22	12
5b	16	10	11	13	19	18
5c	13	9	10	11	17	NA
5d	14	12	13	13	12	22
5e	15	11	16	9	17	21
5f	13	9	10	11	17	18
5g	14	12	13	17	12	22
5h	13	9	10	11	17	15
5i	14	12	13	-	12	22
5j	13	9	10	11	17	22
5k	13	9	10	11	17	22
5l	12	14	12	16	15	16
5m	14	12	13	15	12	20



Where,

	R_1	R_2	R_3	Ar
1)	H	$-N(CH_3)_2$	-H	
2)	2-OH	3-CL	-H	
3)	3-OH	2-CL	-H	
4)	4-OH	-H	$4\text{-}NO_2$	
5)	$2\text{-}NO_2$	2-OH	$4\text{-}NO_2$	
6)	$3\text{-}NO_2$	3-OH	$4\text{-}NO_2$	
7)	$4\text{-}NO_2$	4-OH	-H	
8)	2-CL	$2\text{-}NO_2$	4-OH	
9)	3--CL	$3\text{-}NO_2$	4-OH	
10)	$3\text{-}OCH_3$	$4\text{-}NO_2$	4-OH	
11)	$4\text{-}OCH_3$	-H	4-OH	
12)	$3, 4, 5\text{-}(OCH_3)_3$	-H	$4\text{-}NO_2$	
13)	$-N(CH_3)_2$	-H	$4\text{-}NO_2$	

Scheme-I

4. SYNTHESIS OF 2, 5-DISUBSTITUTED PHENYL-6-AMINE-PYRIMIDINES (1A-M)

Substituted chalcones (0.05 mole), guanidine carbonate (0.05 mole), and ethanol (20mL) were taken in a 100mL round bottom flask. The reaction mixture was refluxed for 4hr.on water bath. The reaction was checked by thin layer chromatography. The mixture was evaporated to its half and left over night. The product precipitated was filtered, washed with water, dried and crystallized from ethanol.

1**a:** Yield 70%: M.P.216°C: IR (KBr): 3153(NH), 1621, 1712, 1322:^{1}HNMR (300MHz DMSO) δ 7.82−7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54;^{13}C NMR(300MHz, DMSO-d_6), 11.3,

13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.0.

1b: (M. P. 212° yield 62%). IR(KBr): 3342.6(N – H),3324 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1552, 1332, 785; H^1NMR (300MHz DMSO) δ 7.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 170.0.

1c :(M. P. 267° yield 68 %.). IR(KBr): 3346.(N – H),3324 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1553, 1336, 785; H^1NMR (300MHz DMSO) δ 7.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54;^{13}C NMR(300MHz, DMSO-d_6) 11.3, 13.4, 16.9, 27.0, 38.9, 34.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 164.6.

1d: (M. P. 238° yield 70 %.). IR(KBr): 3442.6 (N – H),3327 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785, 706; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54;^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 34.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 168.2, 177.3.

1e: (M. P. 245° yield 58 %.). IR(KBr): 3342.6 (N – H),3320 (N-H), 2960 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785; H^1NMR (300MHz DMSO) δ δ 8.62–7.91 (m, 3H, NH_2), 9.1(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 166.2, 169.1.

1f: (M. P. 217° yield 55 %.). IR(KBr): 3348.6, 3326 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785,726; H^1NMR (300MHz DMSO) δ 8.12–7.91 (m, 3H, NH_2), 9.1(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 12.9, 25.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 123.2, 137.3, 166.2, 170.3.

1g: (M. P. 209° yield 66 %.). IR(KBr): 3452.6 (N – H),3352 (N-H), 2969 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785; H^1NMR (300MHz DMSO) δ δ 7.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56(6H, s, 2 x CH_3), 4.28(5H, q, $COOCH_2CH_3$), 3.54 (1H, s, -CONH); ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.0.

1h: (M. P. 251° yield 92 %.). IR (KBr): 3362.6, 3390 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1339, 785 ; H^1NMR (300MHz DMSO) δ 7.82–7.91, 8.9(1H, s, -NH), 2.56, 4.28,
3.54;^{13}CNMR(300MHz,DMSOd_6),11.3,13.4,13.9,27.0,38.9,39.2,39.5,39.7,40.0,40.3,58.5,6.8,77.2,77.6,111.8,119.1,126.2,137.3,162.2..

1i: (M. P. 218^0 yields 71 %.). IR(KBr): 3362.6, 3332 (N-H), 2961 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785, 518; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9, 2.56, 4.28,
3.54;^{13}CNMR(300MHz,DMSOd_6),11.3,13.4,13.9,7.0,38.9,9.2,39.5,39.7,40.0,40.3,58.5,76.8,77.2,77.6,111.8,119.1,126.2,137.

1j :(M. P. 224° yield 65 %.). IR(KBr): 3342.6(N – H),3323 (N-H), 2965 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1555, 1514, 1332, 785; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6) 14.3, 13.5, 13.6, 22.0, 37.9, 38.2, 34.5, 39.4, 40.0, , 58.5, 76.8, 77.2, 77.6, 111.8, 159.1, 126.2, 137.3, 162.2, 162.1.

1k: (M. P. 212° yield 62%). IR(KBr): 3342.6, 3324 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1552, 1332, 785; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.0.

1l: (M. P. 267° yield 68 %.). IR(KBr): 3346.(N – H), 3324 (N-H), 2967 (C-H-Aromatic stretch), 1722.1, 1711, 1650, 1553, 1336, 785; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54;^{13}C NMR(300MHz, DMSO-d_6) 11.3, 13.4, 13.9, 27.0, 38.9, 34.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 164.6.

1m: (M. P. 238° yield 70 %.). IR(KBr): 3442.6 (N – H),3327 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785, 706; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54;^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 34.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.3.

5. SYNTHESIS OF SUBSTITUTED 2, 5-DISUBSTITUTED PHENYL-6-SUBSTITUTED PHENYL SULFONAMIDE-PYRIMIDINES (2A-M).

A mixture of 2, 5-Disubstituted phenyl-6-amine-pyrimidines **(1)** (0.01 mole) and different sulphonil chloride in appropriate amounts in excess of DMF was magnetically stirred for 8 hours. The resulting mixture was allowed to stand for 1 hour keeping the internal temperature between 5 – 10°C. The mixture was refluxed for 3 hours. The solvent was removed under vacuum to obtain the crude product which was washed with water followed by ethanol (10ml) and crystallized from appropriate solvents (70% aqueous ethanol).

2a: M.P. 187°, yield 72%. ; IR (KBr): 3342.6(NH), 1792.9, 1712, 1650. !649, 1322; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR (300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.0.

2b: (M. P. 212° yield 62%). IR(KBr): 3342.6,3324 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1552, 1332, 785; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.0.

2c :(M. P. 267° yield 68 %.). IR(KBr): 3346, 3324 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1553, 1336, 785; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54;^{13}C NMR(300MHz, DMSO-d_6) 11.3, 13.4, 13.9, 27.0, 38.9, 34.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 164.6.

2d: (M. P. 238° yield 70 %.). IR(KBr): 3442.6 (N – H),3327 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785, 706; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2),

8.9(1H, s, -NH), 2.56, 4.28, 3.54;^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 34.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.3.

2e: (M. P. 245° yield 58 %.). IR(KBr): 3342.6 (N – H),3320 (N-H), 2960 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785, 736; H^{1}NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.1.

2f: (M. P. 217° yield 55 %.). IR(KBr): 3348.6(N – H),3326 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785,726; H^{1}NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 12.9, 25.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 123.2, 137.3, 164.2, 165.3.

2g: (M. P. 209° yield 66 %.). IR(KBr): 3452.6 (N – H),3352 (N-H), 2969 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785; H^{1}NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.0.

2h: (M. P. 251° yield 92 %.). IR (KBr): 3362.6, 3390 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1339, 785. H^{1}NMR (300MHz DMSO) δ 8.82–7.91, 8.9(1H, s, -NH), 2.56, 4.28,
3.54,^{13}CNMR(300MHz,DMSOd_6),11.3,13.4,13.9,27.0,38.9,39.2,39.5,39.7,40.0,40.3,58.5,6.8,77.2,77.6,111.8,119.1,126.2,137.3,162.2.

2i: (M. P. 218^0 yields 71 %.). IR(KBr): 3362.6, 3332 (N-H), 2961 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785, 518 H^{1}NMR (300MHz DMSO) δ 8.82–7.91, 8.9(1H, s, -NH), 2.56, 4.28,
3.54;^{13}CNMR(300MHz,DMSOd_6),11.3,13.4,13.9,7.0,38.9,9.2,39.5,39.7,40.0,40.3,58.5,76.8,77.2,77.6,111.8,119.1,126.2,137.

2j :(M. P. 224° yield 65 %.). IR(KBr): 3342.6(N – H),3323 (N-H), 2965 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1555, 1514, 1332, 785; H^{1}NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6) 14.3, 13.5, 13.6, 22.0, 37.9, 38.2, 34.5, 39.4, 40.0, , 58.5, 76.8, 77.2, 77.6, 111.8, 159.1, 126.2, 137.3, 162.2, 162.1.

2k: (M. P. 212° yield 62%). IR(KBr): 3342.6(N – H),3324 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1650, 1552, 1332, 785; H^{1}NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.0.

2l: (M. P. 267° yield 68 %.). IR(KBr): 3346, 3324 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1553, 1336, 785; H^{1}NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54;^{13}C NMR(300MHz, DMSO-d_6) 11.3, 13.4, 13.9, 27.0, 38.9, 34.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 164.6.

2m: (M. P. 238° yield 70 %.). IR(KBr): 3442.6 (N – H),3327 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785, 706; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54;^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 34.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.3.

6. SYNTHESIS OF 2,5-DISUBSTITUTED PHENYL-6-SUBSTITUTED AZOMETHINE-PYRIMIDINES (3A-M)

A mixture of 2, 5-Disubstituted phenyl-6-amine-pyrimidines (1) (0.05mole) and different aromatic aldehydes (0.05mole) in absolute ethanol (100ml) was heated under reflux in the presence of con. H_2SO_4 (1-2dropes) for 3 hr. on a water bath. On cooling a solid mass separated out which was washed repeatedly with acidified water to remove inorganic materials. It was filtered off, dried and crystallized from ethanol

3a: (M. P. 170° yield 72 %.); IR (KBr): 3393.0, 3306.3 (N-H), 1693.8, 1682 (C=N, Azomethine), 1573.5; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH),2.10, 3.31, 3.42, 8.93, 8.1(4H, ArH); ^{13}C NMR(300MHz, DMSO-d_6) 36.93, 39.20, 39.48, 39.76, 40.03, 77.74, 78.18, 78.62, 116.13, 117.4, 118.9, 131.09, 132.51, 158.60, 163.02.

3b: (M. P. 217° yield 55 %.). IR(KBr): 3348.6(N – H),3326 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785 (C-S),726; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54(1H, s, -NH); ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 12.9, 25.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 123.2, 137.3, 164.2, 165.3.

3c: (M. P. 209° yield 66 %.). IR(KBr): 3452.6 (N – H),3352 (N-H), 2969 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.0.

3d: (M. P. 251° yield 92 %.). IR (KBr): 3362.6, 3390 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1339, 785; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9, 2.56,4.28,3.54,^{13}CNMR(300MHz,DMSOd_6),11.3,13.4,13.9,27.0,38.9,39.2,39.5,39.7,40.0,40.3,58.5,6.8,77.2,77.6,111.8,119.1,126.2,137.3,162.2..

3e: (M. P. 218^0 yields 71 %.). IR(KBr): 3362.6, 3332 (N-H), 2961 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785, 518; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9, 2.56,4.28,3.54;^{13}CNMR(300MHz,DMSOd_6),11.3,13.4,13.9,7.0,38.9,9.2,39.5,39.7,40.0,40.3,58.5, 76.8,77.2,77.6,111.8,119.1,126.2,137.

3f: (M. P. 224° yield 65 %.). IR(KBr): 3342.6, 3323 (N-H), 2965 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1555, 1514, 1332, 785; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6) 14.3, 13.5, 13.6, 22.0, 37.9, 38.2, 34.5, 39.4, 40.0, , 58.5, 76.8, 77.2, 77.6, 111.8, 159.1, 126.2, 137.3, 162.2, 162.1.

3g: (M. P. 212° yield 62%). IR(KBr): 3342.6, 3324 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1552, 1332, 785; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -

NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.0.

3h :(M. P. 267° yield 68 %.). IR(KBr): 3346.(N – H),3324 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1553, 1336, 785; H^{1}NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54;^{13}C NMR(300MHz, DMSO-d_6) 11.3, 13.4, 13.9, 27.0, 38.9, 34.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 164.6.

3i: (M. P. 238° yield 70 %.). IR(KBr): 3442.6, 3327 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785, 706; H^{1}NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54;^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 34.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.3.

3j: (M. P. 245° yield 58 %.). IR(KBr): 3342.6, 3320 (N-H), 2960 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785 736; H^{1}NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.1.

3k: (M. P. 217° yield 55 %.). IR(KBr): 3348.6(N – H),3326 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785,726 ; H^{1}NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 12.9, 25.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 123.2, 137.3, 164.2, 165.3.

3l: (M. P. 209° yield 66 %.). IR(KBr): 3452.6 (N – H),3352 (N-H), 2969 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785; H^{1}NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.0.

3m: (M. P. 251° yield 92 %.). IR (KBr): 3362.6, 3390 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1339, 785. H^{1}NMR (300MHz DMSO) δ 8.82–7.91, 8.9(1H, s, -NH), 2.56, 4.28,3.54;^{13}CNMR(300MHz,DMSOd_6),11.3,13.4,13.9,27.0,38.9,39.2,39.5,39.7,40.0,40.3,58.5,6.8 ,77.2,77.6,111.8,119.1,126.2,137.3,162.2.

7. SYNTHESIS OF 2, 5-DISUBSTITUTED PHENYL-6-AZO-PYRIMIDINES (4A-M)

A mixture of Aniline (0.1mol) was dissolved in (20ml) 4% HCl and the solution was cooled to 0-5°C. To this saturated sodium nitrite solution was added drop wise followed by addition of 2, 5-Disubstituted phenyl-6-amine-pyrimidines (1) (0.1mol) in 20ml of 7% NaOH for a period of 10min till the coloured solution is obtained. The solution was stirred for 30min and then neutralized to pH 7 by adding 10% HCl, the solid separated out, filtered dried and crystallized from suitable sovent.

4a: Yield 65%:M.P.83°C: IR (KBr): 3385(-OH), 3130(NH), 1618, 1520(N=N), 1577cm^{-1} (C-N), 3144cm^{-1}; ^{1}H NMR (DMSO-d_6); δ 8.82–7.91, 8.9(1H, s, -NH), 5.3, 6.8–8.2(Ar-H), 8.1;^{13}CNMR(300MHz,DMSOd_6),11.3,13.4,13.9,7.0,38.9,9.2,39.5,39.7,40.0,40.3,58.5,76.8,77.2,77.6,111.8,119.1,126.2,137.

4b: (M. P. 224° yield 65 %.). IR(KBr): 3342.6(N – H),3323 (N-H), 2965 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1555, 1514, 1332, 785; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6) 14.3, 13.5, 13.6, 22.0, 37.9, 38.2, 34.5, 39.4, 40.0, , 58.5, 76.8, 77.2, 77.6, 111.8, 159.1, 126.2, 137.3, 162.2, 162.1.

4c: (M. P. 212° yield 62%). IR(KBr): 3342.6(N – H),3324 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1552, 1332, 785; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.0.

4d: (M. P. 267° yield 68 %). IR(KBr): 3346.(N – H),3324 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1553, 1336, 785; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54;^{13}C NMR(300MHz, DMSO-d_6) 11.3, 13.4, 13.9, 27.0, 38.9, 34.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 164.6.

4e: (M. P. 238° yield 70 %.). IR(KBr): 3442.6 (N – H),3327 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785 , 706; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54;^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 34.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.3.

4f: (M. P. 245° yield 58 %.). IR(KBr): 3342.6 (N – H),3320 (N-H), 2960 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785 736; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.1.

4g: (M. P. 217° yield 55 %.). IR(KBr): 3348.6(N – H),3326 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785,726; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 12.9, 25.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 123.2, 137.3, 164.2, 165.3.

4h: (M. P. 209° yield 66 %.). IR(KBr): 3452.6 (N – H),3352 (N-H), 2969 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.0.

4i: (M. P. 251° yield 92 %.). IR (KBr): 3362.6 (N – H), 3390 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1339, 785; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H,s,NH), 2.56,4.28,3.54;^{13}CNMR(300MHz,DMSOd_6),11.3,13.4,13.9,27.0,38.9,39.2,39.5,39.7,40.0,40.3,58.5,6.8,77.2,77.6,111.8,119.1,126.2,137.3,162.2..

4j: (M. P. 218^0 yields 71 %.). IR(KBr): 3362.6(N – H),3332 (N-H), 2961 (C-H-Aromatic stretch), 1792.9(CONH), 1714 (COO CH_2CH_3), 1650(-C=O, ester), 1332(-CH_3), 785 (C-S), 518 (-Br); H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54(1H,s,CONH);^{13}CNMR(300MHz,DMSOd_6),11.3,13.4,13.9,7.0,38.9,9.2,39.5,39.7,40.0,40.3,58.5,76.8,77.2,77.6,111.8,119.1,126.2,137.

4k: (M. P. 224° yield 65 %.). IR(KBr): 3342.6(N – H),3323 (N-H), 2965 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1555, 1514, 1332, 785; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6) 14.3, 13.5, 13.6, 22.0, 37.9, 38.2, 34.5, 39.4, 40.0, , 58.5, 76.8, 77.2, 77.6, 111.8, 159.1, 126.2, 137.3, 162.2, 162.1.

4l: (M. P. 212° yield 62%). IR(KBr): 3342.6, 3324 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1552, 1332, 785; H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.0.

4m: (M. P. 267° yield 68 %.). IR(KBr): 3346.(N – H-pyrrole),3324 (N-H-phenothiazine), 2967 (C-H-Aromatic stretch), 1792.9(CONH), 1714 (COO CH_2CH_3), 1650(-C=O, ester), 1553 (-NO2), 1336(-CH_3), 785 (C-S); H^1NMR (300MHz DMSO) δ 8.82–7.91 (m, 3H, NH_2), 8.9(1H, s, -NH), 2.56(6H, s, 2 x CH_3), 4.28(5H, q, COO CH_2CH_3), 3.54(1H, s, -CONH);^{13}C NMR(300MHz, DMSO-d_6) 11.3, 13.4, 13.9, 27.0, 38.9, 34.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 164.6.

8. SYNTHESIS OF 2, 5-DISUBSTITUTED PHENYL-6-N-PHENYLTHIOUREA-PYRIMIDINES (5):

2, 5-Disubstituted phenyl-6-amine-pyrimidines (0.05 mole), phenyl thiocynete (0.05 mole), and ethanol (20mL) were taken in a 100mL round bottom flask. The reaction mixture was refluxed for 4hr.on water bath. The reaction was checked by thin layer chromatography. The mixture was evaporated to its half and left over night. The product precipitated was filtered, washed with water, dried and crystallized from ethanol.

5a: Yield 70%: M.P.216°C: IR (KBr): 3153(NH), 1621, 1712, 1322:^{1}HNMR (300MHz DMSO) δ 7.82–7.91, 8.9, 2.56, 4.28, 3.54; ^{13C} NMR (300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 34.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.3.

5b :(M. P. 245° yield 58 %.). IR(KBr): 3342.6 (N – H),3320 (N-H), 2960 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785 736 ; H^1NMR (300MHz DMSO) δ 7.82–7.91, 8.9, 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.1.

5c: (M. P. 217° yield 55 %.). IR(KBr): 3348.6(N – H),3326 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785,726; H^1NMR (300MHz DMSO) δ 7.82–7.91, 8.9, 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 12.9, 25.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 123.2, 137.3, 164.2, 165.3.

5d: (M. P. 209° yield 66 %.). IR(KBr): 3452.6 (N – H),3352 (N-H), 2969 (C-H-Aromatic stretch), 1792.9, 1714 1650, 1332, 785; H^1NMR (300MHz DMSO) δ 7.82–7.91, 8.9, 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.0.

5e :(M. P. 251° yield 92 %.). IR (KBr): 3362.6 (N – H), 3390 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1339, 785. H^1NMR (300MHz DMSO) δ 7.82–7.91, 8.9, 2.56, 4.28,

3.54;^{13}CNMR(300MHz,DMSOd_6),11.3,13.4,13.9,27.0,38.9,39.2,39.5,39.7,40.0,40.3,58.5,6.8,77.2 ,77.6,111.8,119.1,126.2,137.3,162.2..

5f: (M. P. 218^0 yield 71 %.). IR(KBr): 3362.6(N – H),3332 (N-H), 2961 (C-H-Aromatic stretch), 1792.9(CONH), 1714, 1650, 1332, 785, 518; H^{1}NMR (300MHz DMSO) δ 7.82–7.91, 8.9, 2.56, 4.28,

3.54(1H,s,CONH);^{13}CNMR(300MHz,DMSOd_6),11.3,13.4,13.9,7.0,38.9,9.2,39.5,39.7,40.0,40.3,5 8.5,76.8,77.2,77.6,111.8,119.1,126.2,137.

5g: (M. P. 224° yield 65 %.). IR(KBr): 3342.6(N – H),3323 (N-H), 2965 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1555, 1514 1332, 785; H^{1}NMR (300MHz DMSO) δ 7.82–7.91, 8.9, 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6) 14.3, 13.5, 13.6, 22.0, 37.9, 38.2, 34.5, 39.4, 40.0, , 58.5, 76.8, 77.2, 77.6, 111.8, 159.1, 126.2, 137.3, 162.2, 162.1.

5h: (M. P. 212° yield 62%). IR(KBr): 3342.6(N – H),3324 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1552, 1332, 785; H^{1}NMR (300MHz DMSO) δ 7.82–7.91, 8.9, 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.0.

5i: (M. P. 267° yield 68 %.). IR(KBr): 3346.(N – H),3324 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1553, 1336, 785; H^{1}NMR (300MHz DMSO) δ 7.82–7.91, 8.9, 2.56, 4.28, 3.54;^{13}C NMR(300MHz, DMSO-d_6) 11.3, 13.4, 13.9, 27.0, 38.9, 34.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 164.6.

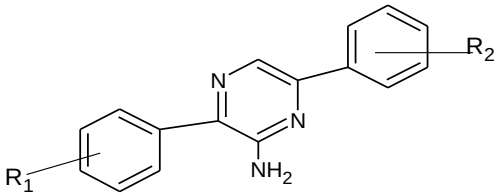
5j: (M. P. 238° yield 70 %.). IR(KBr): 3442.6 (N – H),3327 (N-H), 2967 (C-H-Aromatic stretch), 1792.9 (CONH), 1714, 1650 , 1332, 785, 706; H^{1}NMR (300MHz DMSO) δ 7.82–7.91, 8.9, 2.56, 4.28, 3.54;^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 34.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.3.

5k: (M. P. 245° yield 58 %.). IR(KBr): 3342.6 (N – H),3320 (N-H), 2960 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785, 736; H^{1}NMR (300MHz DMSO) δ 7.82–7.91, 8.9, 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.1.

5l: (M. P. 217° yield 55 %.). IR(KBr): 3348.6(N – H),3326 (N-H), 2967 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785,726; H^{1}NMR (300MHz DMSO) δ 7.82–7.91, 8.9, 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 12.9, 25.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 123.2, 137.3, 164.2, 165.3.

5m: (M. P. 209° yield 66 %.). IR(KBr): 3452.6 (N – H),3352 (N-H), 2969 (C-H-Aromatic stretch), 1792.9, 1714, 1650, 1332, 785; H^{1}NMR (300MHz DMSO) δ 7.82–7.91, 8.9, 2.56, 4.28, 3.54; ^{13}C NMR(300MHz, DMSO-d_6), 11.3, 13.4, 13.9, 27.0, 38.9, 39.2, 39.5, 39.7, 40.0, 40.3, 58.5, 76.8, 77.2, 77.6, 111.8, 119.1, 126.2, 137.3, 162.2, 165.0.

Table – I - *Characterization data of newly synthesized compounds 1a-m.*

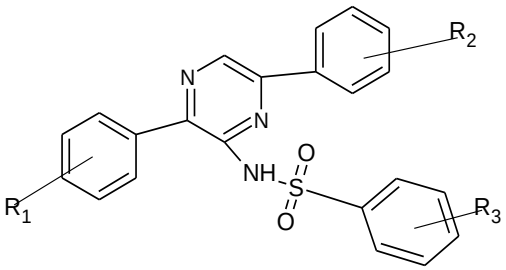


1a-m

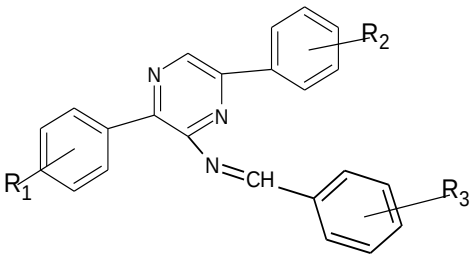
Compound	Molecule Formula	Wt.	RF Value	R	M.P. (°C)	Yield (%)	Analysis (Cal) (found)		
							C	H	N
1a	$C_{18}H_{18}N_4$	434.06	0.36	H	216°	62%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
1b	$C_{16}H_{12}ON_3Cl$	434.06	0.36	2-OH	212°	62%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
1c	$C_{16}H_{12}ON_3Cl$	434.06	0.36	3-OH	267°	68%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
1d	$C_{16}H_{13}ON_3$	434.06	0.36	4-OH	238°	70%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
1e	$C_{16}H_{11}O_3N_4$	434.06	0.36	2-NO_2	245°	58%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
1f	$C_{16}H_{11}O_3N_4$	434.06	0.36	3-NO_2	217°	55%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
1g	$C_{16}H_{11}O_3N_4$	434.06	0.36	4-NO_2	209°	66%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
1h	$C_{16}H_{211}O_2N_4Cl$	434.06	0.36	2-Cl	251°	92%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
1i	$C_{16}H_{211}O_2N_4Cl$	434.06	0.36	3-Cl	218°	71%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
1j	$C_{17}H_{14}O_3N_4$	434.06	0.36	3-OCH_3	224°	65%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
1k	$C_{17}H_{13}ON_3$	434.06	0.36	4-OCH_3	112°	62%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
1l	$C_{19}H_{16}O_3N_3$	434.06	0.36	3, 4, 5-$(OCH_3)_3$	267°	68%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
1m	$C_{18}H_{18}N_4$	434.06	0.36	-$N(CH_3)_2$	238°	70%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
* Eluents for TLC : ethyl acetate – acetone (6 : 4) for **1a, 1b, 1c,1e**; ethyl acetate – chloroform									

(8:2) for **1d, 1f, 1g , 1h, 1i, 1j, 1k, 1l, 1m**.
★ Solvent for crystallization; aq. ethanol for **2a –m &3a-m.**

Table – II. *Characterization data of newly synthesized compounds 2a-m & 3a-m.*



2a-m



3a-m

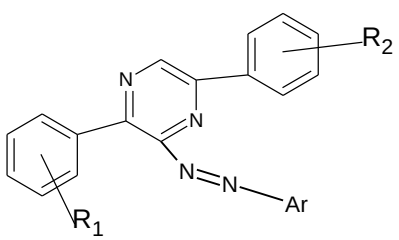
Compound	Molecule Formula	Wt.	RF Value	R	M.P. (°C)	Yield (%)	Analysis (Cal) (found)		
							C	H	N
2a	$C_{24}H_{22}O_2N_4S$	434.06	0.36	H	211°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
2b	$C_{22}H_{22}O_2N_3SCl$	434.06	0.36	2-OH	222°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
2c	$C_{22}H_{22}O_2N_3SCl$	434.06	0.36	3-OH	225°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
2d	$C_{22}H_{22}O_4N_4S$	434.06	0.36	4-OH	232°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
2e	$C_{22}H_{21}O_7N_5S$	434.06	0.36	2-NO_2	235°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
2f	$C_{22}H_{21}O_7N_5S$	434.06	0.36	3-NO_2	215°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
2g	$C_{22}H_{22}O_5N_5S$	434.06	0.36	4-NO_2	235°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
2h	$C_{22}H_{21}O_5N_3SCl$	434.06	0.36	2-Cl	216°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
2i	$C_{22}H_{21}O_5N_3SCl$	434.06	0.36	3-Cl	265°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
2j	$C_{23}H_{24}O_6N_4S$	434.06	0.36	3-OCH_3	217°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
2k	$C_{23}H_{25}O_4N_4S$	434.06	0.36	4-OCH_3	275°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
2l	$C_{25}H_{28}O_7N_4S$	434.06	0.36	3, 4, 5-$(OCH_3)_3$	221°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)

2m	$C_{24}H_{21}O_4N_5S$	434.06	0.36	-N$(CH_3)_2$	223°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
3a	$C_{25}H_{22}N_4$	434.06	0.36	H	214°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
3b	$C_{23}H_{22}ON_3Cl$	434.06	0.36	2-OH	216°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
3c	$C_{23}H_{22}ON_3Cl$	434.06	0.36	3-OH	212°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
3d	$C_{23}H_{22}O_3N_4$	434.06	0.36	4-OH	218°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
3e	$C_{23}H_{21}O_5N_5$	434.06	0.36	2-NO_2	285°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
3f	$C_{23}H_{21}O_5N_5$	434.06	0.36	3-NO_2	275°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
3g	$C_{23}H_{22}O_3N_4$	434.06	0.36	4-NO_2	277°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
3h	$C_{23}H_{22}O_3N_4Cl$	434.06	0.36	2-Cl	291°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
3i	$C_{23}H_{22}O_3N_4Cl$	434.06	0.36	3-Cl	245°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
3j	$C_{24}H_{25}O_4N_4$	434.06	0.36	3-OCH_3	254°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
3k	$C_{24}H_{24}O_2N_3$	434.06	0.36	4-OCH_3	224°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
3l	$C_{26}H_{28}O_5N_4$	434.06	0.36	3, 4, 5-$(OCH_3)_3$	266°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)

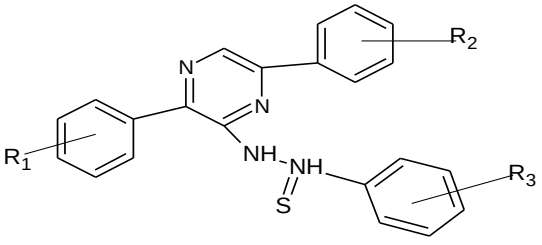
* Eluents for TLC : ethyl acetate – acetone (6 : 4) for **2a, 2b, 2c,2e,3a,3b,3c,3d,** ; ethyl acetate – chloroform (8:2) for **2d, 2f, 2g , 2h, 2i, 2j, 2k, 2l, 2m, 3e, 3f, 3g, 3h, 3i, 3j, 3k, 3l, 3m**.

★ Solvent for crystallization; aq. ethanol for **2a –m &3a-m.**

Table – III. *Characterization data of newly synthesized compounds 4a-m & 5a-m.*



4a-m



5a-m

4a-m Compound	Molecule Formula	Wt.	RF Value	R	M.P. (°C)	Yield (%)	Analysis (Cal) (found)		
							C	H	N
4a	$C_{28}H_{23}ON_5$	434.06	0.36	H	253°	80%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
4b	$C_{26}H_{17}O_2N_4Cl$	434.06	0.36	2-OH	237°	73%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
4c	$C_{26}H_{17}O_2N_4Cl$	434.06	0.36	3-OH	162°	81%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
4d	$C_{26}H_{18}O_2N_4$	434.06	0.36	4-OH	174°	73%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
4e	$C_{26}H_{17}O_4N_5$	434.06	0.36	2-NO_2	261°	77%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
4f	$C_{26}H_{17}O_4N_5$	434.06	0.36	3-NO_2	249°	62%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
4g	$C_{26}H_{17}O_4N_5$	434.06	0.36	4-NO_2	268°	65%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
4h	$C_{26}H_{17}O_3N_5Cl$	434.06	0.36	2-Cl	188°	88%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
4i	$C_{26}H_{17}O_3N_5Cl$	434.06	0.36	3-Cl	263°	71%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
4j	$C_{27}H_{20}O_4N_5$	434.06	0.36	3-OCH_3	155°	56%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
4k	$C_{27}H_{21}O_4N_4$	434.06	0.36	4-OCH_3	225°	92%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
4l	$C_{29}H_{23}O_4N_4$	434.06	0.36	3, 4, 5-$(OCH_3)_3$	143°	88%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
4m	$C_{28}H_{23}ON_5$	434.06	0.36	-$N(CH_3)_2$	176°	55%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
5a	$C_{23}H_{22}O_3N_4S$	434.06	0.36	H	111°	66%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
5b	$C_{23}H_{22}O_3N_4S$	434.06	0.36	2-OH	291°	53%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
5c	$C_{23}H_{22}O_3N_4S$	434.06	0.36	3-OH	135°	70%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
5d	$C_{23}H_{22}O_3N_4S$	434.06	0.36	4-OH	177°	62%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
5e	$C_{23}H_{22}O_3N_4S$	434.06	0.36	2-NO_2	244°	50%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
5f	$C_{23}H_{22}O_3N_4S$	434.06	0.36	3-NO_2	264°	57%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
5g	$C_{23}H_{22}O_3N_4S$	434.06	0.36	4-NO_2	222°	81%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
5h	$C_{23}H_{22}O_3N_4S$	434.06	0.36	2-Cl	215°	87%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
5i	$C_{23}H_{22}O_3N_4S$	434.06	0.36	3-Cl	166°	60%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)

5j	$C_{23}H_{22}O_3N_4S$	434.06	0.36	3-OCH_3	232°	50%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
5k	$C_{23}H_{22}O_3N_4S$	434.06	0.36	4-OCH_3	211°	83%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
5l	$C_{23}H_{22}O_3N_4S$	434.06	0.36	3, 4, 5-$(OCH_3)_3$	225°	86%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
5m	$C_{23}H_{22}O_3N_4S$	434.06	0.36	-$N(CH_3)_2$	113°	70%	65.70 (65.8)	5.0 (5.95)	12.9 (12.0)
* Eluents for TLC : ethyl acetate – acetone (6 : 4) for **5a, 5b, 5c,5e** ; ethyl acetate – chloroform (8:2) for 5d, 5f, 5g , 5h, 5i, 5j.									
★ Solvent for crystallization ; aq. ethanol for **5a –j.**									

9. CONCLUSION

A series of 2, 5-Disubstituted phenyl-6-substituted phenyl sulfonamide - pyrimidines **(2a-m)**, 2, 5-Disubstituted phenyl-6-substituted Azomethine - pyrimidines **(3a-m)**, substituted 2, 5-Disubstituted phenyl-6-azo-pyrimidines **(4a-m)**, substituted 2, 5-Disubstituted phenyl-6-N-phenylthiourea-pyrimidines **(5a-m)** from 2, 5-Disubstituted phenyl-6-amine-pyrimidines **(1a-m)**. These compounds were screened for their antibacterial activity against *S. aureus* and *E. coli* as well as for their antifungal activity against *C. albicans* and *A. niger* Showing good result.

10. ACKNOWLEDGEMENT

One of the author M. N. Narule is thankful to Dr. R. S. Bobhote, principal, VVACSC, Samudrapur for providing necessary facility for the completion of this research work. The authors are also thankful to the Head, Department of Pharmaceutical Science Nagpur University for screening anti-microbial activities, Head RSIC, CDRI, Lucknow for providing the spectral data of the compounds.

REFERENCES

[1] Pemmsin M, Lnu-Due C, Hoguet F, Gaultier C & Nareisse J, Eur J Chem, 23, 1988, 534.
[2] Cammito A, Pemmsin M, Lnu-Due C, Hoguet F, Gaultier C & Nareisse J, Eur J Chem, 25, 1990, 635.
[3] Smith P A S& Kan R O, J Org Chem, 29, 1964, 2261.
[4] Balzarini J& Me Guigan C,J Antimicrob Chemothr, 50, 2002, 5.
[5] Nega S, Aionso J, Diazj A & Junquere F, J Heterocycl Chem, 27, 1990, 269.
[6] Menon R G & Purushothaman E, J Indian Chem Soc, 75, 1996, 1185.
[7] Shishoo C J, Devani M B, Ullas G V, Ananhan S & Bhadti V S, J Heterocycl Chem, 18, 1981, 43.
[8] Joule J & Smith G in "Heterocyclic Chemistry" (ELBS Low price Edition, London), 1979, 126.
[9] Wierzehowski K L, Lifonskao E & Surger D, J Am Chem Soc, 87, 1965, 462.
[10] Garg H G & Prakash C, J Med Chem, 4, 1971, 175.
[11] Machon Z & Krystyna U, Acta Pol Chem, 42(b), 1985, 516.
[12] Sarangan S & Somshekara S, J Indian Chem Soc, 4, 1976, 53.
[13] Shishoo C J, Pathak U S, Rathod I S & Jain K S, Indian J Chem, 38B, 1999, 684.
[14] Atwal K S Swanson B N Unger S E, Floyd D M, Moreland S, Hedberg A, O'reelly B C & Corrie J E T, J Med Che, 34, 1991, 806.
[15] Pitrzkowki Z & Wang G, J Med Chem, 43, 2000. 3704.
[16] Duck W & Diercksen G H F, Computer Physics Communication, 87, 1995, 341.
[17] King R D, Srinivasan A & Slermberg M J E, "Relation Chemical Activity to Structure", 13, 1995, 411.
[18] Ingram V M, "The Biosynthesis of Macrimolecules" Benjamin W A, Inc, New York, 1965.