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SYNTHESIS, CHARACTERIZATION OF SOME NEWER ANTIBACTERIAL AND ANTHELMINTIC CARBAZOLE DERIVATIVES

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ABSTRACT

Carbazole is a very important entity that has a wide spectrum of therapeutic importance[1] Carbazole is a tricyclic compound which has total 12 carbon atoms in which two side rings are 6 carbon benzene ring which are fused with a five membered ring having one nitrogen atom.[2] Many potent medicinal compounds that have carbazole nucleus, are used as antidepressant[3], antibacterial[4], anticonvulsant[5], antidiabetic[6], antidiarrhoel[7], antifungal[8], antihypertensive[9], anti-inflammatory[10], antioxidant[11], antitubercular[12], antitumour[13], prove the therapeutic importance of carbazole. Carbazole nucleus is also found in many naturally occurring medicinal compounds; For example, the carbazomycins are an unprecedented class of antibiotics with a carbazole framework. Carbazomycins A and B inhibit the growth of phytopathogenic fungi and have antibacterial and anti-yeast activities.[14] In this study, synthesis of some new derivatives of carbazole had been planned by incorporation of some benzaldehyde derivatives compounds at its 9th position further react with aniline that gave some new N-[(9H-Carbazol-9-yl)(substituted phenyl)methyl]benzenamine derivatives.

KEYWORDS: Anthelmentic, Antibacterial, Open capillary method.

INTRODUCTION

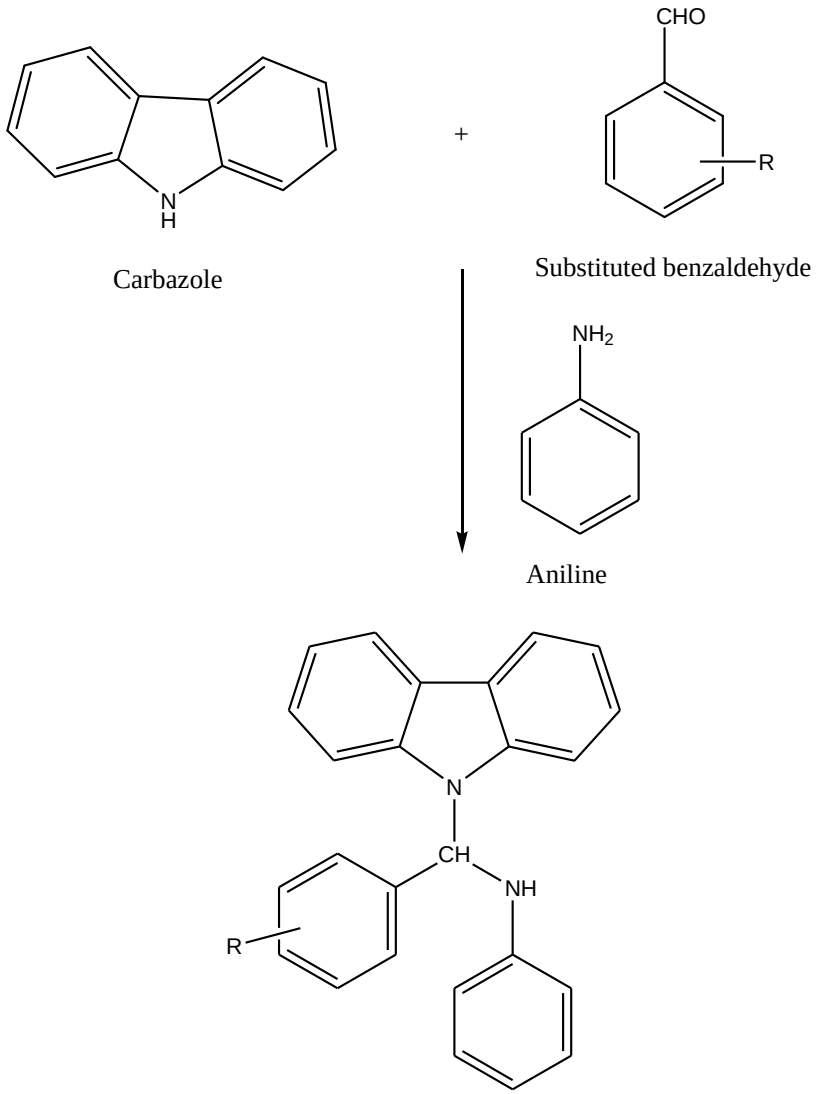
Carbazole and its derivatives is a crucial sort of nitrogenous aromatic heterocyclic compounds possess desirable electronic and charge-transport properties and also have large π-conjugated system, due to this, the various functional groups are easily introduced into the structurally rigid carbazol ring.[2] These characteristics results in the extensive potential applications of carbazole-based derivatives in the field of medicinal chemistry Such as antidepressant[3], antibacterial[4], anticonvulsant[5], antidiabetic[6], antidiarrhoel[7], antifungal[8], antihypertensive[9], anti-inflammatory[10], antioxidant[11], antitubercular[12], antitumour[13] agent etc. Carbazole nucleus is also found in many biologically important naturally occurring compounds, isolated from the Rutaceae-family. The stem bark of Murraya koenigii contains dimeric carbazole alkaloids alongside six carbazole alkaloids. Traditionally, this plant is employed as stimulant, stomachic, febrifuge, analgesic and for the treatment of diarrhoea, dysentry and bug bites.[15] Carbazole ring are also present in a variety of naturally occurring medicinally active substances. For example, the carbazomycins are an unprecedented class of antibiotics with a carbazole framework. Carbazomycins A and B inhibit the expansion of phytopathogenic fungi and have antibacterial and anti-yeast activities.[16]

MATERIALS AND METHODS

TLC (Thin layer chromatography) was used for checking the purity of all newly synthesized compound and for visualization of spot, UV chamber and iodine vapors were used. Open capillary method is used for determination of sharp melting point. Mass spectra of compounds were recorded by LC-MS (2010 AT) Shimadzu. For identification of functional group, Infrared (FTIR) spectra were recorded by Fourier Transform Infrared Spectrophotometer (FTIR-8400S) Shimadzu. Proton (^{1}H)NMR spectra were recorded by ^{1}H NMR Spectrophotometer (DRX-400) Bruker.

General synthetic procedure for the synthesis of N-[(9H-Carbazol-9-yl)(substituted phenyl)methyl]benzenamine (1-10)

Scheme of Work



N-[(9*H*-Carbazol-9-yl)(substituted phenyl)methyl]benzenamine

Table 1: Different substitution on N-[(9H-Carbazol-9-yl)(substituted phenyl) methyl] benzenamine.

Compound No.	R	Compound No.	R
1.	*p*-chloro	6.	*o-chloro*
2.	*p-dimethyl amino*	7.	*3,4,5-trimethoxy*
3.	*o*-nitro	8.	*p-nitro*
4.	*m*-nitro	9.	*p-methoxy*
5.	*p*-fluro	10.	*m-chloro*

Euimolar quantity of various substituted benzaldehyde derivatives (0.03mol) was added in a solution of aniline (2.79gm, 0.03mol) and carbazole 5.01gm, (0.03mol) in a round bottom

flask. 45 ml of ethanol was also added in this solution. The reaction mixture was adjusted to the pH of 3.5 with hydrochloric acid slowly with constant stirring under ice cold condition for half an hour to avoid odor of benzaldehyde derivatives. This reaction mixture was refluxed on water bath for 3 hr. After refluxing, the reaction mixture was kept for cooling at 0°C for 2-3 days in deep freeze. The completion of reaction was monitored by TLC using benzene and methanol (7:3) as the mobile phase. The solvent was removed under vacuum pressure and the product was recrystallized from ethanol to give compound **(1-10)**.

Spectral data for newly synthesized compounds are given below-

***N*-[(9*H*-carbazol-9-*yl*)(4-chlorophenyl)methyl]benzenamine (1)**

Yield: 52%, m.p. 234-235 °C; **FTIR (KBr)**: 3419.79 (N-H str.), 3051.39 (Ar, C-H str.), 2866.41 (Ali, C-H), 1600.92 (Ar, C=C str.), 1327.03 (C-N str.), 748.38 (C-Cl); **^{1}H NMR** (δ, DMSO- d_6, ppm): 2.89 (s, 1H, CH), 6.90-7.69 (m, 17H, Ar-H), 11.34 (s, 1H, NH, exchangeable with D_2O); **EIMS (m/z): [**$M]^+$ 382.88 Fragments: 349.45, 306.79, 272.35, 291.77. **Elemental analysis calculated for** $C_{25}H_{19}ClN_2$: C, 78.42; H, 5.00; Cl, 9.26; N, 7.32. Found C, 78.41; H, 5.02; Cl, 9.25; N, 7.31.

***N*-[(9*H*-Carbazole-9-*yl*)(4-dimethylaminophenyl)methyl] benzenamine (2)**

Yield: 53%, m.p. 232-233 °C; **FTIR (KBr)**:3417.86 (N-H str.), 3147.83 (Ar, C-H str.), 2887.44 (Ali, C -H), 1543.05 (Ar, C=C str.), 1338.60 (C-N str.), 1327.03 (CH_3 bend.); **^{1}H NMR** (δ, DMSO- d_6, ppm): 2.93 (s, 1H, CH), 3.50 (s, 6H, CH_3), 8.24-9.32 (M, 17H, Ar-CH), 11.34 (s, 1H, NH, Exchangeable with D_2O); **EIMS (m/z): [**$M]^+$ 391.51, Fragments: 348.45, 346.4, 314.5, 299.40; **Elemental analysis** Calcd. For $C_{27}H_{25}N_3$: C, 82.83; H, 6.44; N, 10.73; Found: C, 82.80; H, 6.41; N, 10.72.

***N*-[(9*H*-Carbazole-9-*yl*)(2-nitrophenyl)methyl]benzenamine (3)**

Yield: 54%, m.p. 240-241 °C; **FTIR (KBr)**: 3419.79 (N-H str.), 3049.46 (Ar, C-H str.), 2887.44 (Ali, C-H), 1600.92 (Ar, C=C str.), 1492.9 (N-O str.), 1327.03 (C-N str.); **^{1}H NMR** (δ, DMSO- d_6, ppm): 2.59 (s, 1H, CH), 6.93-8.24 (m, 17H, Ar-CH), 11.32 (s, 1H, NH Exchangeable with D_2O); **EIMS (m/z): [**$M]^+$ 394.45 Fragments: 349.45, 317.34, 302.33, 272.35; **Elemental analysis:** Calcd. For $C_{25}H_{19}N_3O_2$: C, 76.32; H, 4.87; N, 10.68; O, 8.13 Found: C, 76.33; H, 4.85; N, 10.67; O, 8.11.

***N*-[(9*H*-Carbazole-9-*yl*)(3-nitrophenyl)methyl]benzenamine (4)**

Yield: 59%, m.p. 239-240 °C; **FTIR (KBr)**: 3419.79 (N-H str.), 3049.46 (Ar, C-H str.), 2887.44 (Ali, C-H), 1600.92 (Ar, C=C str.), 1525.697 (N-O str.), 1350.17 (C-N str.); **^{1}H NMR** (δ, DMSO- d_6, ppm): 2.11 (s, 1H, CH), 7.19-8.34 (m, 17H, Ar-CH), 10.84 (s, 1H, NH, Exchangeable with D_2O); **EIMS (m/z): [**$M]^+$ 395.45 Fragments: 349.45, 317.34, 302.34, 272.35; **Elemental analysis:** Calcd. For $C_{25}H_{19}N_3O_2$: C, 76.32; H, 4.87; N, 10.68; O, 8.13 Found: C, 76.30; H, 4.85; N, 10.67; O, 8.11

***N*-[(9*H*-Carbazole-9-*yl*)(4-flurophenyl)methyl]benzenamine (5)**

Yield: 64%, m.p. 226-227 °C; **FTIR (KBr)**: 3419.79 (N-H str.), 3049.46 (Ar, C-H str.), 2887.44 (Ali, C-H), 1600.92 (Ar, C=C str.), 1350.17 (C-N str.), 1327.03 (C-F); **^{1}H NMR** (δ, DMSO- d_6, ppm): 2.05 (s, 1H, CH), 6.92-7.69 (m, 17H, Ar-CH), 11.22 (s, 1H, NH Exchangeable with D_2O); **EIMS (m/z): [**$M]^+$ 367.44 Fragments: 349.45, 305.37, 274.32, 272.35; **Elemental analysis:** Calcd. For $C_{25}H_{19}FN_2$: C, 81.94; H, 5.23; F, 5.18; N, 7.64 Found: C, 81.92; H, 5.21; F, 5.20; N, 7.61

***N*-[(9*H*-Carbazole-9-*yl*)(2-chlorophenyl)methyl]benzenamine (6)**

Yield: 57%, m.p. 216-217 °C; **FTIR (KBr)**: 3419.79 (N-H str.), 3049.46 (Ar, C-H str.), 2887.44 (Ali, C-H), 1600.92 (Ar, C=C str.), 1350.17 (C-N str.), 748.38 (C-Cl); **^{1}H NMR** (δ, DMSO- d_6, ppm): 2.19 (s, 1H, CH), 6.92-8.34 (m, 17H, Ar-CH), 11.17 (s, 1H, NH, Exchangeable with D_2O); **EIMS (m/z): [**$M]^+$ 382.88 Fragments: 349.45, 306.79, 291.77, 272.35; **Elemental analysis:** Calcd. For $C_{25}H_{19}ClN_2$: C, 78.42; H, 5.00; Cl, 9.26 N, 7.3 Found: C, 78.40; H, 5.05; Cl, 9.22 N, 7.31

***N*-[(9*H*-Carbazole-9-*yl*)(3,4,5-trimethoxyphenyl)methyl]benzenamine(7)**

Yield: 53%, m.p. 227-228 °C. **FTIR (KBr)**: 3417.86 (N-H str.), 3049.46 (Ar, C-H str.), 2887.44 (Ali, C-H), 1600.92 (Ar, C=C str.), 1327.03 (C-N str.), 1238.3 (C-O); **^{1}H NMR** (δ, DMSO- d_6, ppm): 2.1 (s, 1H, CH), 3.86 (s, 9H, OCH_3), 7.15-8.24 (m, 15H, Ar-CH), 11.26 (s, 1H, NH, Exchangeable with D_2O); **EIMS (m/z):** Fragments: 349.45, 365.5, 362.5, 272.35S; **Elemental analysis** Calcd. For $C_{28}H_{26}N_2O_3$: C, 76.69; H, 5.98; N, 6.39; O, 10.95**;** Found: C, 76.68; H, 5.96; N, 6.37; O, 10.93

***N*-[(9*H*-Carbazole-9-*yl*)(4-nitrophenyl)methyl]benzenamine (8)**

Yield: 54%, m.p. 233-234 °C; **FTIR (KBr)**: 3419.79 (N-H str.), 3049.46 (Ar, C-H str.), 2887.44 (Ali, C-H), 1600.92 (Ar, C=C str.), 1525.697 (N-O str.), 1350.17 (C-N str.); **^{1}H**

NMR (δ, DMSO- d_6, ppm): 2.54 (s, 1H, CH), 6.91-8.24 (m, 17H, Ar-CH), 11.27 (s, 1H, NH, Exchangeable with D_2O); **EIMS (m/z): [**$M]^+$ 394.45 Fragments: 349.45, 317.34, 302.33, 272.35 **Elemental analysis** Calcd. For $C_{25}H_{19}N_3O_2$: C, 76.32; H, 4.87; N, 10.68; O, 8.13 Found: C, 76.31; H, 4.85; N, 10.69; O, 8.16

***N*-[(9*H*-Carbazole-9-*yl*)(4-methoxyphenyl)methyl]benzenamine (9)**

Yield: 59%, m.p. 233-234 °C; **FTIR (KBr)**: 3419.79 (N-H str.), 3049.46 (Ar, C-H str.), 2887.44 (Ali, C-H), 1600.92 (Ar, C=C str.), 1525.697 (N-O str.), 1350.17 (C-N str.); **^{1}H NMR** (δ, DMSO- d_6, ppm): 2.51 (s, 1H, CH), 3.86 (s, 3H, OCH), 6.92-8.34 (M, 17H, Ar-CH), 11.26 (s, 1H, NH, Exchangeable with D_2O); **EIMS (m/z): [**$M]^+$ 378.18 Fragments: 349.45, 302.37, 287.36, 272.35; **Elemental analysis** Calcd. For $C_{26}H_{22}N_2O$: C, 82.51; H, 5.86; N, 7.40; O, 4.23; Found: C, 82.49; H, 5.83; N, 7.43; O, 4.2

***N*-[(9*H*-Carbazole-9-*yl*)(3-chlorophenyl)methyl]benzenamine (10)**

Yield: 61%, m.p. 231-232 °C; **FTIR (KBr)**: 3419.79 (N-H str.), 3049.46 (Ar, C-H str.), 2887.44 (Ali, C-H), 1600.92 (Ar, C=C str.), 1350.17 (C-N str.), 748.38 (C-Cl); **^{1}H NMR** (δ, DMSO- d_6, ppm): 3.86 (s, 1H, CH), 7.15-8.24 (M, 17H, Ar-CH), 1126 (s, 1H, NH, Exchangeable with D_2O); **EIMS (m/z): [**$M]^+$ 382.88 Fragments: 349.45, 306.79, 291.78, 272.35; **Elemental analysis:** Calcd. For $C_{25}H_{19}ClN_2$: C, 78.42; H, 5.00; Cl, 92.6; N, 7.32 Found: C, 78.40; H, 5.03; Cl, 92.7; N, 7.3

RESULT AND DISCUSSION

A series of N-[(9H-Carbazol-9-yl)(substituted phenyl)methyl]benzenamine were synthesized, completion of reaction was monitored by TLC on silica gel G plate and their Rf values were noted. Synthesized compounds were purified by recrystallization method and their melting points were analyzed by open capillary method and were noted. Synthesized compounds were screened for antibacterial activity by paper disc diffusion method[17] using nutrient agar medium against following microorganism: *S. aureus,* B.subtilis, (Gram positive) and *E. coli, P. aeruginosa,* (Gram negative). In the paper disc-diffusion method, paper disc impregnated with compounds dissolved in DMSO at concentration 25, 50 and 100 µg ml^{-1} were used. Disc impregnated with DMSO were used as solvent control for antibacterial activity because of free solubility of test compounds. The microorganism culture was spread over nutrient agar media in petri dishes and then the disc impregnated with the solution was placed on the surface of the media inoculated with the bacterial strain. The plates were incubated at 35°C for 24 hrs for bacterial cultures. After incubation, the zones of inhibition around the disc were

observed. The zones of inhibition indicate that the compounds inhibit growth of microorganism. Each testing is done in triplicate. Ciprofloxacin at conc. 100µg ml^{-1} were used as standard drug for antibacterial activity. Results were interpreted in terms of diameter (mm) of zone of inhibition (Table 2, Figure 1 and Table 3, Figure 2). Antibiotic zone reader was used for measuring of zone of inhibition. The results revealed that newly synthesized compounds 3 and 5 were possessed higher activity for ***E. coli*** and ***B. subtilis*** and compound 2.5, 6 and 10 possesed higher activity for ***P. aeruginosa*** and ***S. aureus*** in comparision to ciprofloxacin.

Table 2: Antibacterial Activity of The Synthesized Compounds Against *E.Coli* and *B. Subtilis* Bacteria.

Comp. No.	*E. coli*			*B. subtilis*		
	25µg/ml	**50µg/ml**	**100µg/ml**	**25µg/ml**	**50µg/ml**	**100µg/ml**
1.	9.76 ± 0.11	10.70 ± 0.23	14.45 ± 0.10	10.66 ± 0.30	11.16 ± 0.18	12.86 ± 0.21
2.	10.82 ± 0.28	11.46 ± 0.16	13.36 ± 0.25	10.02 ± 0.43	13.76 ± 0.32	17.92 ± 0.30
3.	8.45 ± 0.18	13.42 ± 0.30	16.53 ± 0.11	9.10 ± 0.28	13.11 ± 0.26	16.37 ± 0.25
4.	9.59 ± 0.19	11.5 7± 0.64	15.02 ± 0.42	10.28 ± 0.23	14.64 ± 0.46	16.22 ± 0.41
5.	10.36 ± 0.26	13.56 ± 0.20	15.85 ± 0.18	11.16 ± 0.20	13.26 ± 0.14	15.13 ± 0.20
6.	10.45 ± 0.35	11.20 ± 0.36	16.18 ± 0.48	10.40 ± 0.12	11.47 ± 0.26	12.95 ± 0.12
7.	8.92 ±0.30	10.12 ± 0.16	12.46 ± 0.11	9.02 ± 0.26	11.26 ± 0.21	13.21 ± 0.17
8.	9.35 ± 0.21	10.33 ± 0.05	13.37 ± 0.17	10.12 ± 0.72	13.06 ± 0.05	16.00 ± 0.11
9.	9.60 ± 0.48	11.33 ± 0.11	14.24 ± 0.22	8.16 ± 0.05	10.52 ± 0.17	12.11 ± 0.36
10.	10..53±0.07	10.30±0.25	12.21±0.20	8.36±0.15	10.53±0.20	11.87±0.19
Ciprofloxacin	-	13.62 ±0.13	-	-	13.32 ±0.21	-
Control	-	-	-	-	-	-

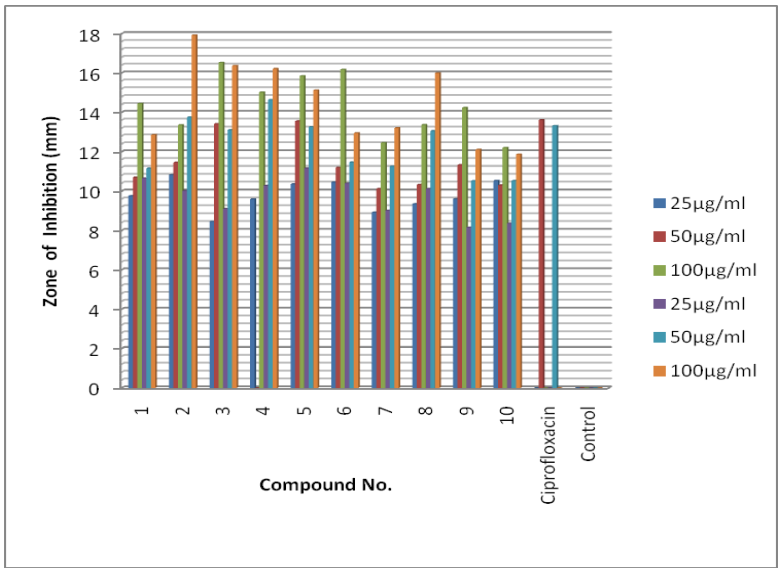


Figure 1: Antibacterial Activity of The Synthesized Compounds Against *E.Coli* and *B.Subtilis* Bacteria.

Table 3: Antibacterial activity of the synthesized compounds against *P. aeruginosa* and *S. aureus* bacteria.

Comp. No.	*P. aeruginosa*			*S. aureus*		
	25µg/ml	50µg/ml	100µg/ml	25µg/ml	50µg/ml	100µg/ml
1.	9.26 ± 0.32	10.56 ± 0.17	11.17 ± 0.25	9.86 ± 0.12	11.43 ± 0.30	14.86 ± 0.14
2.	10.53 ± 0.45	13.31 ± 0.35	16.51 ± 0.65	10.12 ± 0.40	13.17 ± 0.37	14.32 ± 0.20
3.	9.13 ± 0.16	12.19 ± 0.27	12.23 ± 0.11	10.36 ± 0.54	13.05 ± 0.23	15.17 ± 0.12
4.	9.11 ± 0.11	12.10 ± 0.45	13.53 ± 0.21	8.92 ± 0.30	10.27 ± 0.40	11.71 ± 0.50
5.	10.72 ± 0.24	13.23 ± 0.54	14.32 ± 0.26	10.21 ± 0.15	13.21 ± 0.15	15.71 ± 0.16
6.	10.76 ± 0.23	13.01 ± 0.26	13.40 ± 0.32	10.53 ± 0.45	13.41 ± 0.31	15.21 ± 0.47
7.	9.21 ± 0.13	11.28 ± 0.31	13.30 ± 0.17	10.43 ± 0.23	13.26 ± 0.11	17.42 ± 0.05
8.	9.51 ± 0.36	11.15 ± 0.26	14.48 ± 0.28	9.32 ± 0.11	11.35 ± 0.15	14.63 ± 0.71
9.	9.02 ± 0.15	10.28 ± 0.42	11.37 ± 0.17	8.36 ± 0.05	10.09 ± 0.22	11.30 ± 0.24
10.	10.15 ± 0.16	13.12 ± 0.18	17 ± 0.19	10.36 ± 0.07	13.34 ± 0.25	15.36 ± 0.26
Ciprofloxacin	-	13.47 ± 0.32	-	-	13.51 ± 0.18	-
Control	-	-	-	-	-	-

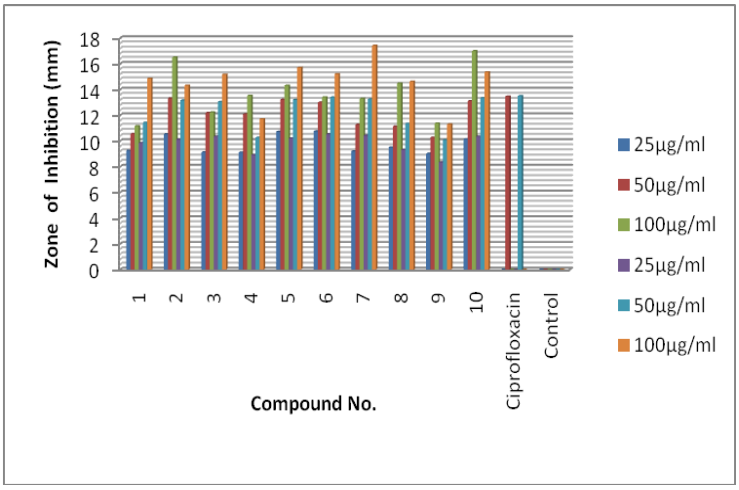


Figure 2: Antibacterial activity of the synthesized compounds against *P. aeruginosa* and *S. aureus* bacteria.

The newly compounds were also evaluated for anthelmintic activity.[18] Anthelmintic studies were carried out against the *Pheretima Posthuma* species of earthworm by Garg and Atal method[18] at different concentration level (0.1%, 0.2% and 0.5%). Suspensions of samples were prepared by triturating synthesized compounds (100 mg) with Tween 80 (0.5%) and 20 ml distilled water and resulting mixture was magnetically stirred for 30 min. Then the suspension was diluted to concentration level of 0.1%, 0.2 % and 0.5 %. Suspension of reference drug, albendazole was prepared in a similar way by triturating drug with tween 80

(0.5%) and distilled water separately and finally diluted to contain 0.1%, 0.2% and 0.5% w/v of albendazole (Garg and Atal method). Five earthworms of almost similar sizes (2 inch in length) were placed in petri- plates of 4 inch diameter containing 50 ml of suspension of test sample and reference drug at room temperature. Another set of five earthworms were kept as control in 50 ml suspension of distilled water and Tween 80 (0.5%). The time required for the paralysis and death of the worms was noted and their mean was calculated for triplicate study. The death time was ascertained by placing the earthworms in warm water at 50°C, which stimulated the movement, if the worm was alive. The results revealed that compound 3,5,10 showed good activity in comparison to albendazole.

Results were interpreted in terms of **Mean paralyzing time (min) and Mean death time (min)** (Table 4, Figure-3)

Table 4: Anthelmintic Activity of The Synthesized Compounds.

Compound No.	Mean paralyzing time (min)			Mean death time (min)		
	5mg/ml	10mg/ml	20mg/ml	5mg/ml	10mg/ml	20mg/ml
Control	-	-	-	-	-	-
Albendazole		37.44 ± 0.62			43.41 ± 0.72	
1	47.83 ± 0.23	38.83 ± 0.28	35.25 ± 1.08	64.92 ± 0.88	62.42 ± 0.72	54.33 ± 0.58
2	47.67 ± 0.58	42.72 ± 0.75	40.51 ± 0.42	62.42 ± 0.72	60.67 ± 0.29	57.95 ± 0.88
3	40.33 ± 0.58	37.25 ± 0.38	32.33 ± 0.58	46.62 ± 0.46	44.41 ± 1.23	39.92 ± 0.62
4	43.60 ± 0.36	39.4 ± 0.62	34.42 ± 0.63	53.75 ± 0.66	51.17 ± 1.04	46.92 ± 0.63
5	44.34 ± 0.12	37.59 ± 0.72	24.16 ± 1.04	48.33 ± 0.58	43.68 ± 0.35	37.08 ± 0.14
6	48.66 ± 0.57	41.25 ± 0.43	37.01 ± 0.36	54.33 ± 1.15	47.42 ± 0.52	43.00 ± 0.90
7	43.12 ± 0.76	39.41 ± 0.38	26.33 ± 0.28	53.83 ± 0.14	49.42 ± 0.72	40.58 ± 0.52
8	49.55 ± 0.50	40.83s ± 0.29	38.41 ± 1.23	56.90 ± 0.87	51.17 ± 0.38	43.90 ± 0.87
9	42.37 ± 0.11	39.76 ± 0.62	36.25 ± 1.10	59.42 ± 0.52	54.08 ± 1.01	51.25 ± 0.25
10	40.75 ± 0.66	37.62 ± 0.29	27.75 ± 0.66	45.67 ± 0.63	43.33 ± 1.15	32.58 ± 0.61

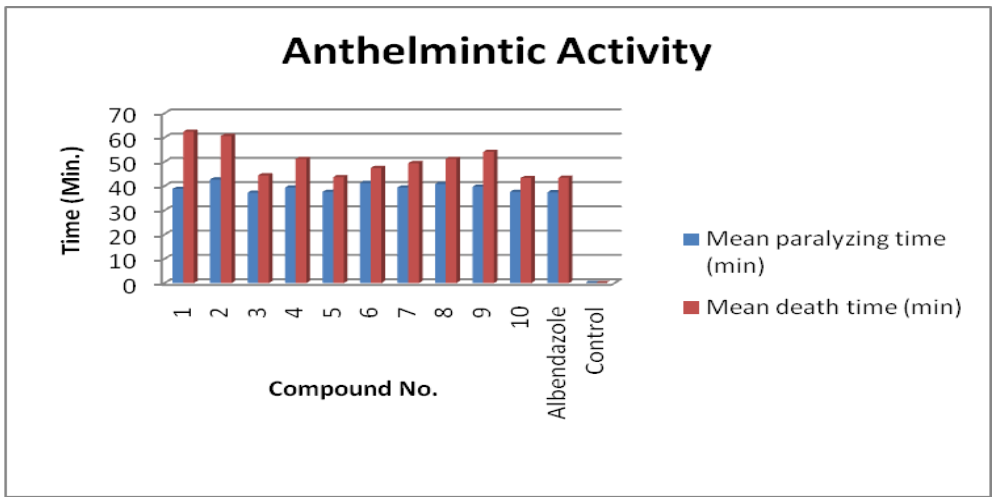


Figure 3: Anthelmintic Activity of Synthesized Compounds.

CONCLUSION

Some newer carbazole derivatives were synthesized by the reaction of some substitute benzaldehyde derivatives with presynthesized carbazole and aniline successfully with various good yields. Synthesized newer carbazole derivatives were identified by FTIR, mass spectral analysis, ^{1}H NMR spectroscopy and elemental analysis. Synthesized and characterized all the newer carbazole derivatives were screened for antibacterial activity [by paper disc diffusion method[17] using nutrient agar medium against following microorganism: *S. aureus,* B.subtilis, (Gram positive) and *E. coli, P. aeruginosa,* (Gram negative)] and for anthelmintic activity with *Pheretima Posthuma* species of earthworm by Garg and Atal method.[18] Data obtained from anthelmintic activity suggested that nitro at ortho position, fluoro at para position and chloro group at meta position compounds were more active in comparison to another compounds. Data obtained from antibacterial activity suggested that o-nitro and p-fluoro group were more active for *E. coli, P. aeruginosa,* (Gram negative bacteria) and *p-dimethyl amino, p*-fluro and *m-chloro were more active for S. aureus,* B.subtilis, (Gram positive bacteria).

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