CHAPTER 5: EXPERIMENTAL DETAILS

5.0 General procedures

Organic solvents were distilled prior to use. Unless otherwise stated, all other organic solvents and reagents were used as received from commercial suppliers.

Analytical Thin Layer Chromatography (TLC) was performed using MERCK 25 TLC plates 20 × 20 cm silica gel 60 F_{254} precoated aluminium plate. Spot were developed in an iodine chamber or viewed under ultra violet light and the ethyl acetate:hexane as the solvent or eluent.

Nuclear magnetic resonace (NMR) spectra were taken in deuterated chloroform on the JEOL FT-NMR Lambda 400 MHz and FT-NMR ECA 400 MHz spectrometer with tetramethylsilane (TMS) as internal standard. Chemical shifts are reported in ppm on δ scale, and the coupling constant is given in Hz.

IR spectra were recorded on Perkin-Elmer 1600 series FT-IR or Perkin-Elmer RX FT-IR spectrophotometer. Melting point was carried out in glass capillaries recorded on a melting point apparatus Fargo MP-ID and are uncorrected. Mass spectroscopic analyses were performed using GCMS-QP2010 Plus, Shimadzu.

Fluorescence spectra were recorded by Luminescence Spectrometer, Model LS 50B, Perkin Elmer. The measurements were recorded at room temperature at the same setting and quartz cells were used.

5.1 Preparation of quinoline derivatives

5.1.1 Preparation of 2-*N*-(*m*-methyl)piperidinoquinoline (25)

2-Chloroquinoline (0.327 g, 0.002moles) was added to a solution of 3-methylpiperidine (2.58ml, 0.022 moles) in 3 ml of ethanol and the mixture was refluxed for 6 hours. The mixture was then cooled and the solvent was evaporated off. The residue was dissolved in water and then extracted with diethyl ether (3 ×10ml). The ether extracts were washed with water (3 ×10ml) and dried over anhydrous sodium sulphate. Evaporation of the solvent gave the product, a yellowish solid which was purified by crystallization using ethanol as the solvent. **Mp** 70 -72 °C; (0.288g, 64%); **IR** (ν_{max}, cm^{-1}): 2944(alkane C-H stretch), 1617 and 1507(aromatic C=C); **^{1}H NMR** (ppm, 400 MHz, $CDCl_3$) δ_H: 7.85 (1H, d, *J*=9.04 Hz, H-4),7.68 (1H,d, *J*=8.08 Hz, H-5), 7.57 (1H, dd, *J*=7.80 Hz, H-8), 7.50 (1H, td, *J*=8.32 Hz, H-7), 7.18 (1H, td, *J*=8.08 Hz, H-6), 7.00 (1H, d, *J*=9.28 Hz, H-3), 4.43 (2H, m, H-6'), 2.93 (1H, td, *J*=3.16 Hz, H-2'), 2.59 (1H, td, *J*=10.71 Hz,*J*=10.47 Hz, H-2'), 1.80(4H, m, H-4', H-5'), 1.94 (1H, m, H-3'), 0.99 (3H, d, *J*=6.6 Hz, $-CH_3$); **^{13}C NMR** (ppm, 100 MHz, $CDCl_3$) δc: 157.4 (C-2), 148. (C-9), 137.1 (C-4), 129.3 (C-7), 127.0 (C-5), 126.4 (C-8), 122.7 (C-6), 121.9 (C-10), 109.8 (C-3), 52.9 (C-2'), 45.6 (C-6'), 33.4 (C-4'), 30.9 (C-3'), 25.2 (C-5'), 19.3 ($-CH_3$); **GCMS**: Found M^+=226.00; $C_{15}H_{18}N_2$ requires M^+=226.15; **Anal. Calcd** for $C_{15}H_{18}N_2$: C, 80; H, 8; N, 12. Found: C, 76.76; H, 8.63; N, 12.03; **R_f** (Hexane:Ethyl acetate, 2:1) = 0.67

5.1.2 Preparation of 2-*N*-(*p*-methyl)piperidinoquinoline (26)

2-Chloroquinoline (0.327 g, 0.002 moles) was added to a solution of 4-methylpiperidine (2.60 ml, 0.022 moles) in 3 ml of ethanol and the mixture was refluxed for 5 hours. The mixture was then cooled and the solvent evaporated off. The residue was dissolved in water and then extracted with diethyl ether (3 ×10ml). The ether extracts were washed with water (3 ×10ml) and dried over anhydrous sodium sulphate. Evaporation of the solvent gave the product, a yellowish liquid which was purified by washing with several portions of chloroform. (0.324g, 72%); **IR** (ν_{max}, cm^{-1}): 2922(alkane C-H stretch), 1618 and 1506 (aromatic C=C); **^{1}H NMR** (ppm, 400 MHz,$CDCl_3$) δ_H: 7.83 (1H, d, *J*=9.28 Hz, H-4), 7.69 (1H, d, *J*=8.28 Hz, H-5), 7.56 (1H, d, *J*=8.08Hz, H-8), 7.50 (1H, td, *J*=8.56 Hz, H-7), 7.18 (1H, t, *J*=7.80 Hz, H-6), 6.98 (1H,d, *J*=9.04 Hz, H-3), 4.52 (2H, d, *J*=13.2 Hz, H-2'), 2.58 (2H, td, H-6'), 1.76 (2H, d, *J*=12.92 Hz, H-3'), 1.68 (1H, m, H-4'), 1.28 (2H, m, H-5'), 0.97 (3H, d, *J*=6.60 Hz, -CH_3); **^{13}C NMR** (ppm, 100 MHz, $CDCl_3$)δc: 157.5 (C-2), 148.0 (C-9), 137.1 (C-4), 129.2 (C-7), 127.0 (C-5), 126.4 (C-8), 122.7 (C-6), 121.8 (C-10), 109.8(C-3), 45.5 (C-2', C-6'), 33.9 (C-3', C-5'), 31.2 (C-4'), 21.8 (-CH_3); **GCMS**: Found M^+=226.00; $C_{15}H_{18}N_2$ requires M^+=226.15; **R_f** (Hexane:Ethyl acetate,2:1) = 0.65

5.1.3 Preparation of 2-*N*-anilinoquinoline (28)

2-Chloroquinoline (0.5 g, 0.003 moles) was added to a solution of aniline (0.27 ml, 0.003 moles) in 3 ml of ethanol and the mixture was refluxed for 5 hours. The mixture was then cooled and the solvent evaporated off. The residue was dissolved in water and then extracted with diethyl ether (3 ×10ml). The ether extracts were washed with water (3 ×10ml) and dried over anhydrous sodium sulphate. Evaporation of the solvent gave the product, a yellowish solid which was purified by crystallization by using ethanol as the solvent. **Mp** 92-94 °C; (0.396g, 60%); **IR** (ν_{max},cm^{-1}): 3405 (N-H), 1621 (C=N), 1596 and 1496 (aromatic C=C); **^{1}H NMR** (ppm, 400 MHz, $CDCl_3$) δ_H: 7.93 (1H, d, *J*=8.8 Hz, H-4), 7.78 (1H, d, *J*=8.3 Hz, H-5), 7.59 (4H, m, H-8, H-7, H-2', H-6'), 7.37 (2H, t, *J*=7.6 Hz, H-3', H-5'), 7.30 (1H, t, *J*=7.1 Hz, H-4'), 7.10 (1H, t, *J*=7.3 Hz, H-6), 7.00 (1H, d, *J*=8.8 Hz, H-3); **^{13}C NMR** (ppm, 100 MHz, $CDCl_3$) δc: 154.2 (C-2), 147.2 (C-9), 139.9 (C-1'), 137.9 (C-4), 129.9 (C-3', C-5'), 129.2 (C-7), 127.4 (C-5), 126.4 (C-8), 124.0 (C-10), 123.3 (C-6, C-4'), 120.6 (C-2', C-6'), 111.6 (C-3); **GCMS**: Found M^+=219.00; $C_{15}H_{12}N_2$ requires M^+=220.27; **R_f** (Hexane:Ethyl acetate,2:1)=0.52

5.1.4 Preparation of 2-*N*- (*m*-methyl)anilinoquinoline (30)

2-Chloroquinoline (0.5 g, 0.003 moles) was added to a solution of 3-methylaniline (0.27 ml, 0.003 moles) in 3 ml of ethanol and the mixture was refluxed for 5 hours. The mixture was then cooled and the solvent evaporated off. The residue was dissolved in water and then extracted with diethyl ether (3 ×10ml). The ether extracts were washed with water (3 ×10ml) and dried over anhydrous sodium sulphate. Evaporation of the solvent gave the product, a dark brown solid which was purified by crystallization by using ethanol as the solvent. **Mp** 60-62 °C; (0.386g, 55%); **IR** (ν_{max}, cm^{-1}): 3408 (N-H), 1607 (C=N), 1541 and 1490 (aromatic C=C); **^{1}H NMR** (ppm, 400 MHz, $CDCl_3$) δ_H: 7.93 (1H, d, *J*=8.8 Hz, H-4), 7.78 (1H, d, *J*=8.3 Hz, H-5), 7.65 (1H, d, *J*=7.8 Hz, H-8), 7.59 (1H, td, H-7), 7.29 (4H, m, H-6, H-2', H-5', H-6'), 7.01 (1H, d, *J*=8.8 Hz, H-3), 6.93 (1H, d, *J*=7.08 Hz, H-4'), 6.76 (1H, s, N-H), 2.38 (3H, s, $-CH_3$); **^{13}C NMR** (ppm, 100 MHz, $CDCl_3$) δc: 154.49 (C-2), 147.71 (C-9), 140.02 (C-1'), 139.15 (C-3'), 137.72 (C-4), 129.77 (C-5'), 129.08 (C-7), 127.40 (C-5), 126.63 (C-8), 124.13 (C-6, C-4'), 123.06 (C-10), 121.36 (C-2'), 117.79 (C-6'), 111.52 (C-3), 21.54 ($-CH_3$); **GCMS**: Found M^+=233.00; $C_{16}H_{14}N_2$ requires M^+=234.30; **Anal. Calcd** for $C_{16}H_{14}N_2$: C, 82; H, 6; N, 12. Found: C, 79.95; H, 6.03; N, 11.68; **R_f** (Hexane:Ethyl acetate, 2:1) = 0.58

5.1.5 Preparation of 2-*N*-(*p*-methyl)anilinoquinoline (32)

2-Chloroquinoline (1.0 g, 0.006 moles) was added to a solution of 4-methylaniline (0.66 ml, 0.006 moles) in 5 ml of ethanol and the mixture was refluxed for 5 hours. The mixture was then cooled and the solvent evaporated off. The residue was dissolved in water and then extracted with diethyl ether (3 ×10ml). The ether extracts were washed with water (3 ×10ml) and dried over anhydrous sodium sulphate. Evaporation of the solvent gave the product, a yellowish solid which was purified by crystallization by using ethanol as the solvent. **Mp** 134-136 °C; (0.46g, 65%); **IR** (ν_{max}, cm^{-1}): 3407 (N-H), 1621 (C=N), 1536 (aromatic C=C); **^{1}H NMR** (ppm, 400 MHz, $CDCl_3$) δ_H: 7.91 (1H, d, *J*=9.0 Hz, H-4), 7.76 (1H, d, *J*=8.6 Hz, H-5), 7.64 (1H, d, *J*=7.8 Hz, H-8), 7.58 (1H, t, *J*=6.8 Hz, H-7), 7.40 (2H, d, *J*=8.3 Hz, H-2', H-6'), 7.28 (1H, d, *J*=7.1 Hz, H-6), 7.19 (2H, d, *J*=8.5 Hz, H-3', H-5'), 6.98 (1H, d, *J*=9.0 Hz, H-3), 6.72 (1H, s, NH) 2.35 (3H, s, $-CH_3$); **^{13}C NMR** (ppm, 100 MHz, $CDCl_3$)δc: 154.81 (C-2), 147.66 (C-9), 137.74 (C-1'), 137.40 (C-4'), 133.14 (C-4), 129.81 (C-3', C-5'), 127.43 (C-7), 126.50 (C-5), 124.05 (C-8), 122.95 (C-6, C-10), 121.34 (C-2', C-6'), 111.28 (C-3), 20.86 ($-CH_3$); **GCMS**: Found M^+=233.00; $C_{16}H_{14}N_2$ requires M^+=234.30; **Anal. Calcd** for $C_{16}H_{14}N_2$: C, 82; H, 6; N, 12. Found: C, 79.74; H, 5.99; N, 11.73.; **R_f** (Hexane:Ethyl acetate, 2:1) = 0.51

5.1.6 Preparation of 2-*N*-(*m*-ethyl)anilinoquinoline (34)

2-Chloroquinoline (1.0 g, 0.006 moles) was added to a solution of 3-ethylaniline (0.76 ml, 0.006 moles) in 10 ml of ethanol and the mixture was refluxed for 7 hours. The mixture was then cooled and the solvent evaporated off. The residue was dissolved in water and then extracted with diethyl ether (3 ×10ml). The ether extracts were washed with water (3 ×10ml) and dried over anhydrous sodium sulphate. Evaporation of the solvent gave the product, a dark brown liquid which was purified by crystallization by using ethanol as the solvent. (0.95g, 64%); **IR** (ν_{max}, cm^{-1}): 3403 (N-H), 2964 (alkane, C-H), 1604 and 1504 (aromatic C=C); **^{1}H NMR** (ppm, 400 MHz, $CDCl_3$) δ_H: 7.93 (1H, d, *J*= 8.76 Hz, H-4), 7.78 (1H, d, *J*=8.32 Hz, H-5), 7.65 (1H, d, *J*=8.04 Hz, H-8), 7.58 (1H, td, H-7), 7.38 (2H, d, *J*=8.08 Hz, H-2', H-4'), 7.28 (2H, m, H-6, H-5'), 7.01 (1H, d, *J*=8.8 Hz, H-6'), 6.96 (1H, d, *J*=7.04 Hz, H-3), 6.79 (1H, s, N-H), 2.68 (2H, q, *J*=7.56 Hz, 7.60 Hz, 7.80 Hz, $-CH_2-$), 1.27 (3H, t, *J*=7.56 Hz, $-CH_3$); **^{13}C NMR** (ppm, 100 MHz, $CDCl_3$)δc: 154.52 (C-2), 147. (C-9) 145.54 (C-3'), 140.07 (C-1'), 137.71 (C-4), 129.76 (C-5'), 129.14 (C-7), 127.40 (C-5), 126.66 (C-8), 124.15 (C-6), 123.05 (C-10), 122.93 (C-4'), 120.25 (C-2'), 118.06 (C-6'), 111.52 (C-3), 28.88 ($-CH_2-$), 15.48 ($-CH_3$); **GCMS**: Found M^+=247.00; $C_{17}H_{16}N_2$ requires M^+=248.32; **R_f** (Hexane:Ethyl acetate, 2:1) = 0.57

5.1.7 Preparation of 2-*N*-(*p*-ethyl)anilinoquinoline (36)

2-Chloroquinoline (1.0 g, 0.006 moles) was added to a solution of 4-ethylaniline (0.76 ml, 0.006 moles) in 10 ml of ethanol and the mixture was refluxed for 6 hours. The mixture was then cooled and the solvent evaporated off. The residue was dissolved in water and then extracted with diethyl ether (3 ×10ml). The ether extracts were washed with water (3 ×10ml) and dried over anhydrous sodium sulphate. Evaporation of the solvent gave the product, a light yellow solid which was purified by crystallization by using ethanol as the solvent. **Mp** 88-90 °C; (1.11g, 75%); **IR** (ν_{max}, cm^{-1}): 3407 (N-H), 2960 (alkane C-H), 1623 (C=N), 1536 (aromatic C=C); **^{1}H NMR** (ppm, 400 MHz, $CDCl_3$) δ_H: 7.91 (1H, d, *J*=9.04 Hz, H-4), 7.76 (1H, d, *J*=8.04 Hz, H-5), 7.64 (1H, d, *J*=8.04, H-8), 7.58 (1H, td, *J*=7.08 Hz, H-7), 7.45 (2H, d, *J*=8.56 Hz, H-2', H-6'), 7.30 (1H, d, *J*=7.80, H-6), 7.22 (2H, d, *J*=8.32 Hz, H-3', H-5'), 6.99 (1H, d, *J*=8.76 Hz, H-3), 6.74 (1H, s, N-H), 2.67 (2H, q, *J*=7.56 Hz,-CH_2-),1.26(3H, t, *J*=7.56 Hz,-CH_3); **^{13}C NMR** (ppm, 100MHz, $CDCl_3$)δc: 154.77 (C-2), 147.81 (C-9), 139.57 (C-1'), 137.68 (C-4,C-4'), 129.75 (C-7), 128.63 (C-3', C-5'), 127.43 (C-5), 126.61 (C-8), 124.10 (C-6), 122.93 (C-10), 121.28 (C-2', C-6'), 111.29 (C-3), 28.32 (-CH_2-), 15.73 (-CH_3); **GCMS**: Found M^+=247.00; $C_{17}H_{16}N_2$ requires M^+=248.32; **Anal. Calcd** for $C_{17}H_{16}N_2$: C, 82; H, 7; N, 11. Found: C, 79.56; H, 6.52; N, 11.01.; **R_f** (Hexane:Ethyl acetate; 2:1) = 0.53

5.1.8 Preparation of 2-*N*-methylanilinoquinoline (38)

2-Chloroquinoline (1.0 g, 0.006 moles) was added to a solution of *N*-methylaniline (0.66 ml, 0.006 moles) in 10 ml of ethanol and the mixture was refluxed for 6 hours. The mixture was then cooled and the solvent evaporated off. The residue was dissolved in water and then extracted with diethyl ether (3 ×10ml). The ether extracts were washed with water (3 ×10ml) and dried over anhydrous sodium sulphate. Evaporation of the solvent gave the product, a light yellow solid which was purified by crystallization by using ethanol as the solvent. (0.72g, 51%); **IR** (ν_{max}, cm^{-1}): 2894(alkane C-H stretch), 1618(C=N), and 1496(aromatic C=C); **^{1}H NMR** (ppm, 400 MHz,$CDCl_3$) δ_H: 7.80 (1H, d, *J*=8.28 Hz, H-4), 7.69 (1H, d, *J*=8.80 Hz, H-5), 7.55 (2H, m, H-8, H-7), 7.43 (2H, m, H-6, H-4'), 7.29 (2H, m, H-2', H-6'), 7.23 (2H, m, H-3', H-5'), 6.75 (1H, d, *J*=9.28 Hz, H-3), 3.63 (1H, s, N-CH_3); **^{13}C NMR** (ppm, 100MHz, $CDCl_3$)δc: 157.07 (C-2), 147.86 (C-1'), 146.50 (C-9), 136.26 (C-4), 129.76 (C-3', C-5'), 129.38 (C-7), 127.23 (C-5, C-8), 126.61 (C-2',C-6'), 125.86 (C-6), 123.30 (C-10), 122.41 (C-4'), 112 (C-3), 38.59 (-CH_3); **GCMS**: Found M^+=233.00; $C_{16}H_{14}N_2$ requires M^+=234.30; **R_f** (Hexane:Ethyl acetate; 2:1) = 0.59

5.1.9 Preparation of 2-*N*-ethylanilinoquinoline (40)

2-Chloroquinoline (1.0 g, 0.006 moles) was added to a solution of *N*-ethylaniline (0.76 ml, 0.006 moles) in 10 ml of ethanol and the mixture was refluxed for 7 hours. The mixture was then cooled and the solvent evaporated off. The residue was dissolved in water and then extracted with diethyl ether (3 ×10ml). The ether extracts were washed with water (3 ×10ml) and dried over anhydrous sodium sulphate. Evaporation of the solvent gave the product, a black liquid which was purified by crystallization by using ethanol as the solvent. (0.77g,52 %); **IR** (ν_{max}, cm^{-1}): 2971 (alkane C-H stretch), 1618 (C=N), 1594 and 1494 (aromatic C=C); **^{1}H NMR** (ppm, 400 MHz, $CDCl_3$) δ_H: 7.77 (1H, d, *J*=8.28 Hz, H-4), 7.66 (1H, d, *J*=9.24Hz,H-5), 7.55 (2H, t, *J*=7.80 Hz, H-2', H-6'), 7.43 (2H, t, *J*=7.84 Hz, H-3', H-5'), 7.28 (3H, t, *J*=9.00 Hz, H-6, H-7, H-8), 7.20 (1H, t, *J*=7.56 Hz, H-4'), 6.60 (1H, d, *J*=9.04 Hz, H-3), 4.19 (2H, q, *J*=7.08 Hz, 6.84Hz, $-CH_2-$), 1.27 (3H, t, *J*=7.08Hz, $-CH_3$); **^{13}C NMR** (ppm, 100MHz, $CDCl_3$) δc: 156.50 (C-2), 147.96 (C-1'), 144.94 (C-9), 136.22 (C-4), 129.82 (C-3', C-5'), 129.27 (C-7), 127.94 (C-5), 127.20 (C-8), 126.70 (C-6), 126.17 (C-10), 123.27 (C-4'), 122.17 (C-2', C-6'), 112.24 (C-3), 44.95 ($-CH_2-$), 13.10 ($-CH_3$); **GCMS**: Found M^+=247.00; $C_{17}H_{16}N_2$ requires M^+=248.32; **R_f** (Hexane:Ethyl acetate; 2:1) = 0.62

5.1.10 Preparation of 2-*N*-(*m*-methoxy)anilinoquinoline (42)

2-Chloroquinoline (1.0 g, 0.006 moles) was added to a solution of 3-methoxyaniline (0.78 ml, 0.006 moles) in 10 ml of ethanol and the mixture was refluxed for 7 hours. The mixture was then cooled and the solvent evaporated off. The residue was dissolved in water and then extracted with diethyl ether (3 ×10ml). The ether extracts were washed with water (3 ×10ml) and dried over anhydrous sodium sulphate. Evaporation of the solvent gave the product, a light brown solid which was purified by crystallization by using ethanol as the solvent. **Mp** 118-120 °C; (1.05g, 70%); **IR** (ν_{max}, cm^{-1}): 3413 (N-H), 1599 and 1493 (aromatic C=C); **^{1}H NMR** (ppm, 400 MHz, $CDCl_3$) δ_H: 7.93 (1H, d, *J*=8.76 Hz, H-4), 7.79 (1H, d, *J*=8.52 Hz, H-5), 7.65 (1H, d, *J*=7.84 Hz, H-8), 7.59 (1H, td, *J*=8.56 Hz, H-7), 7.38 (1H, t, *J*=2.2 Hz, H-6), 7.28 (2H, m, H-2', H-5'), 7.04 (1H, dd, *J*=9.04 Hz, H-4'), 7.00(1H, d, *J*= 9.04 Hz, H-6'), 6.77 (1H, s, N-H), 6.65 (1H, dd, *J*=8.04 Hz, H-3),3.85 (3H, s, -OCH_3); **^{13}C NMR** (ppm, 100 MHz, $CDCl_3$)δc: 160.46 (C-3'),154.19 (C-2), 147.63 (C-9), 141.51 (C-1'), 129.87 (C-4), 129.79 (C-5'), 127.42 (C-7), 126.83 (C-5, C-8), 124.17 (C-6), 123.23 (C-10), 112.56 (C-3), 111.96(C-4'), 108.50 (C-6'), 106.09 (C-2'), 55.29 (OCH_3); **GCMS**: Found M^+=249.00; $C_{16}H_{14}N_2O$ requires M^+=250.30; **Anal. Calcd** for $C_{16}H_{14}N_2O$: C, 77; H, 5; N, 11. Found: C, 74.87; H, 5.46; N, 10.97.; **R_f** (Hexane:Ethyl acetate, 2:1) = 0.50

5.1.11 Preparation of 2-*N*-(*p*-methoxy)anilinoquinoline (44)

2-Chloroquinoline (1.0 g, 0.006 moles) was added to a solution of 4-methoxyaniline (0.75 g, 0.006 moles) in 10 ml of ethanol and the mixture was refluxed for 8 hours. The mixture was then cooled and the solvent evaporated off. The residue was dissolved in water and then extracted with diethyl ether (3 ×10ml). The ether extracts were washed with water (3 ×10ml) and dried over anhydrous sodium sulphate. Evaporation of the solvent gave the product, a dark brown solid which was purified by crystallization by using ethanol as the solvent. **Mp** 126-128 °C; (1.02g, 68%); **IR** (ν_{max}, cm^{-1}): ; **^{1}H NMR** (ppm, 400 MHz, $CDCl_3$) δ_H: 7.89 (1H, d, *J*=9.0 Hz, H-4), 7.72 (1H, d, *J*=8.3 Hz, H-5), 7.63 (1H, d, *J*=8.1 Hz, H-8), 7.57 (1H, t, *J*=8.3 Hz, H-7), 7.43 (2H, d, *J*=9.0 Hz, H-2', H-6'), 7.28 (1H, d, *J*=7.1 Hz, H-6), 6.94 (2H, d, *J*=8.8 Hz, H-3', H-5'), 6.88 (1H, d, *J*=9.0 Hz, H-3), 6.66 (1H, s, NH), 3.83 (3H, s, $-OCH_3$); **^{13}C NMR** (ppm, 100 MHz, $CDCl_3$) δc: 156.43 (C-2), 155.44 (C-4'), 147.82 (C-9), 137.73 (C-4), 132.96 (C-1'), 129.77 (C-7), 127.45 (C-5), 126.42 (C-8), 124.00 (C-2', C-6'), 122.77 (C-6, C-10), 114.59 (C-3', C-5'), 110.87 (C-3), 55.57 (OCH_3); **GCMS**: Found M^+=250.00; $C_{16}H_{14}N_2O$ requires M^+=250.30; **Anal. Calcd** for $C_{16}H_{14}N_2O$: C, 77; H, 5; N, 11. Found: C, 73.83; H, 4.81; N, 10.81.; **R_f** (Hexane:Ethyl acetate, 2:1) = 0.40

5.1.12 Preparation of 2-*N*-(*m*-chloro)anilinoquinoline (46)

2-Chloroquinoline (1.0 g, 0.006 moles) was added to a solution of 3-chloroaniline (0.63 ml, 0.006 moles) in 10 ml of ethanol and the mixture was refluxed for 8 hours. The mixture was then cooled and the solvent evaporated off. The residue was dissolved in water and then extracted with diethyl ether (3 ×10ml). The ether extracts were washed with water (3 ×10ml) and dried over anhydrous sodium sulphate. Evaporation of the solvent gave the product, a yellowish solid which was purified by crystallization by using ethanol as the solvent. **Mp** 89-91 °C; (1.11g, 73%); **IR** (ν_{max}, cm^{-1}): 3406 (N-H), 1623 (C=N), 1593 and 1486(aromatic C=C); **^{1}H NMR** (ppm, 400 MHz, $CDCl_3$) δ_H: 7.94 (1H, d, *J*=9.04 Hz, H-4), 7.80 (1H, d, *J*=8.28 Hz, H-5), 7.66 (1H, d, *J*=8.04 Hz, H-8), 7.60 (1H, d, *J*=8.52 Hz,H-7), 7.55 (2H, dd, *J*=9.52 Hz,H-3, H-6'), 7.38 (2H, t, *J*=7.56 Hz,H-2', H-4'), 7.31 (1H, t, *J*=8.04 Hz, H-6), 7.12 (1H, t, *J*=7.36 Hz, H-5'),7.00 (1H, d, *J*=9.04 Hz,H-3); **^{13}C NMR** (ppm, 100MHz, $CDCl_3$) δc: 153.47 (C-2), 147.40 (C-9), 141.56 (C-1'), 137.92 (C-4), 134.75 (C-3'), 130.07 (C-5'), 129.92 (C-7), 127.41 (C-5), 127.01 (C-8), 123.59 (C-6, C-4'), 122.58 (C-10), 119.59 (C-2'), 117.65 (C-6'), 112.09 (C-3); **GCMS**: Found M^+=253.00; $C_{15}H_{11}ClN_2$ requires M^+=254.71; **Anal. Calcd** for $C_{15}H_{11}ClN_2$: C, 71; H, 4; N, 11. Found: C, 68.41; H, 3.79; N, 10.71.; **R_f** (Hexane:Ethyl acetate, 2:1) = 0.47

5.1.13 Preparation of 2-*N*-(*p*-chloro)anilinoquinoline (48)

2-Chloroquinoline (1.0 g, 0.006 moles) was added to a solution of 4-chloroaniline (0.78 g, 0.006 moles) in 10 ml of ethanol and the mixture was refluxed for 7 hours. The mixture was then cooled and the solvent evaporated off. The residue was dissolved in water and then extracted with diethyl ether (3 ×10ml). The ether extracts were washed with water (3 ×10ml) and dried over anhydrous sodium sulphate. Evaporation of the solvent gave the product, a white solid which was purified by crystallization by using ethanol as the solvent. **Mp** 142-144 °C; (1.02g, 67%); **IR** (ν_{max}, cm^{-1}): 3405 (N-H), 1599 and 1490 (aromatic C=C) ; **^{1}H NMR** (ppm, 400 MHz, $CDCl_3$) δ_H: 7.95 (1H, d, *J*=8.80 Hz, H-4), 7.80 (1H, d, *J*=8.56 Hz, H-5), 7.62 (4H, m, H-8, H-7, H-3', H-5'), 7.33 (3H, m, H-6, H-2', H-6'), 6.91(1H, d, *J*=8.80 Hz, H-3), 6.75(1H, s, N-H); **^{13}C NMR** (ppm, 100MHz, $CDCl_3$) δc: 153.78 (C-2),147.44 (C-9), 138.87 (C-1'), 137.80 (C-4), 129.85 (C-7), 129.07 (C-3',C-5'), 127.53 (C-4'), 127.40(C-5), 126.82 (C-8),124.15 (C-6), 123.37 (C-10), 121.19 (C-2', C-6'), 111.94 (C-3); **GCMS**: Found M^+=253.00; $C_{15}H_{11}ClN_2$ requires M^+=254.71; **Anal. Calcd** for $C_{15}H_{11}ClN_2$: C, 71; H, 4; N, 11. Found: C, 68.48; H, 3.81; N, 10.72.; **R_f (**Hexane:Ethyl acetate, 2:1) = 0.48

5.2 Fluorescence Measurements

The fluorescence studies of the compounds prepared was carried out in various solvent using fluorescence Spectrometer LS 50B at room temperature. Samples were prepared from stock solution (10^{-4} M) of the corresponding compound in ethyl acetate, tetrahydrofuran, chloroform and isopropanol to give concentration of 10^{-5} M and 10^{-6} M.

5.2.1 Fluorescence Measurement of quinoline derivatives

2-*N*-(*m*-methyl)piperidinoquinoline (25)

2-*N*-(*m*-methyl)piperidinoquinoline(1.0 mg) was dissolved in solvents (10 ml)

Concentration = 4.4218 X 10^{x} M, where $10^{x} = 10^{-4}$, 10^{-5} and 10^{-6}

Excitation and emission slits = 0

2-*N*-(*p*-methyl)piperidinoquinoline (26)

2-*N*-(*p*-methyl)piperidinoquinoline (1.0 mg) was dissolved in solvents (10 ml)

Concentration = 4.4218 X 10^{x} M, where $10^{x} = 10^{-4}$, 10^{-5} and 10^{-6}

Excitation and emission slits = 0

2-*N*-anilinoquinoline (28)

2-*N*-anilinoquinoline (1.0 mg) was dissolved in solvents (10 ml)

Concentration = 4.5399 X 10^{x} M, where $10^{x} = 10^{-4}$, 10^{-5} and 10^{-6}

Excitation and emission slits = 0

2-*N*- (*m*-methyl)anilinoquinoline (30)

2-*N*- (*m*-methyl)anilinoquinoline (1.0 mg) was dissolved in solvents (10 ml)

Concentration = 4.2680 X 10^{x} M, where $10^{x} = 10^{-4}$, 10^{-5} and 10^{-6}

Excitation and emission slits = 0

2-*N*-(*p*-methyl)anilinoquinoline (32)

2-*N*-(*p*-methyl)anilinoquinoline (1.0 mg) was dissolved in solvents (10 ml)

Concentration = 4.2680 X 10^{x} M, where $10^{x} = 10^{-4}$, 10^{-5} and 10^{-6}

Excitation and emission slits = 0

2-*N*-(*m*-ethyl)anilinoquinoline (34)

2-*N*-(*m*-ethyl)anilinoquinoline (1.0 mg) was dissolved in solvents (10 ml)

Concentration = 4.0271 X 10^{x} M, where $10^{x} = 10^{-4}$, 10^{-5} and 10^{-6}

Excitation and emission slits = 0

2-*N*-(*p*-ethyl)anilinoquinoline (36)

2-*N*-(*p*-ethyl)anilinoquinoline (1.0 mg) was dissolved in solvents (10 ml)

Concentration = 4.0271 X 10^{x} M, where $10^{x} = 10^{-4}$, 10^{-5} and 10^{-6}

Excitation and emission slits = 0

2-*N*-methylanilinoquinoline (38)

2-*N*-methylanilinoquinoline (1.0 mg) was dissolved in solvents (10 ml)

Concentration = 4.2680 X 10^{x} M, where $10^{x} = 10^{-4}$, 10^{-5} and 10^{-6}

Excitation and emission slits = 0

2-*N*-ethylanilinoquinoline (40)

2-*N*-ethylanilinoquinoline (1.0 mg) was dissolved in solvents (10 ml)

Concentration = 4.0271 X 10^{x} M, where $10^{x} = 10^{-4}$, 10^{-5} and 10^{-6}

Excitation and emission slits = 0

2-*N*-(*m*-methoxy)anilinoquinoline (42)

2-*N*-(*m*-methoxy)anilinoquinoline (1.0 mg) was dissolved in solvents (10 ml)

Concentration = 3.9952 X 10^{x} M, where $10^{x} = 10^{-4}$, 10^{-5} and 10^{-6}

Excitation and emission slits = 0

2-*N*-(*p*-methoxy)anilinoquinoline (44)

2-*N*-(*p*-methoxy)anilinoquinoline (1.0 mg) was dissolved in solvents (10 ml)

Concentration = 3.9952 X 10^{x} M, where $10^{x} = 10^{-4}$, 10^{-5} and 10^{-6}

Excitation and emission slits = 0

2-*N*-(*m*-chloro)anilinoquinoline (46)

2-*N*-(*m*-chloro)anilinoquinoline (1.0 mg) was dissolved in solvents (10 ml)

Concentration = 3.9260 X 10^{x} M, where $10^{x} = 10^{-4}$, 10^{-5} and 10^{-6}

Excitation and emission slits = 0

2-*N*-(*p*-chloro)anilinoquinoline (48)

2-*N*-(*p*-chloro)anilinoquinoline (1.0 mg) was dissolved in solvents (10 ml)

Concentration = 3.9260 X 10^{x} M, where $10^{x} = 10^{-4}$, 10^{-5} and 10^{-6}

Excitation and emission slits = 0