Green chemistry: conventional and microwave induced synthesis of various thiazolidinone derivatives from 3-{[(1*E*)-(2'-chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(substitutedphenyldiazenyl)phenol and their antimicrobial screening

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Abstract

2-[(2'-chloro-7'-methoxyquinoline-3'-yl)]-3-[3"-hydroxy-6"-(substitutedphenyldiazenyl)phenyl]-5-methyl-1,3-thiazolidin-4-one **2a-s** have been synthesized by the reaction of 3-{[(1*E*)-(2'-chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(substituted phenyldiazenyl)phenol **1a-s** with thiolactic acid. The reaction was carried out by both conventional and microwave methods. The compounds have been screened for their antibacterial and antifungal activities against different microorganisms. The structures of novel synthesized compounds have been established on the basis of elemental analysis, Mass, ^{1}H NMR, ^{13}C NMR and IR spectral data.

Keywords: Quinoline, thiazolidinone, microwave irradiation

Introduction

The synthesis of quinolines and their derivatives has been of considerable interest because a large number of natural products and drugs contain this heterocyclic unit[1]. It is well known that quinolines exhibit a wide range of biological activities,[2-5] and are valuable reagents for the synthesis of nano and mesostructures with enhanced electronic and photonic properties.[6] Consequently, various procedures such as the Skraup, Doebner-von Miller, Friedlander and Combes syntheses have been developed for the synthesis of quinoline derivatives.[7,8]

Thiazolidinone and its derivative are known to posses a variety of physiological properties; viz. analgesic, local and spiral anaesthetics, antibacterial,[9,10] anti-inflammatory,[11]antituberculor,[12] anticancer, anti HIV[13] and fungicidal[14] activities.

The application of microwave irradiation is used for carrying out chemical transformations, which are safe with higher chemical yields[15,16] and are pollution free and eco-friendly,[17,18] render the microwave method superior to conventional methods. Microwave assisted reactions were carried out in a "Q-Pro-M Modified Microwave system".

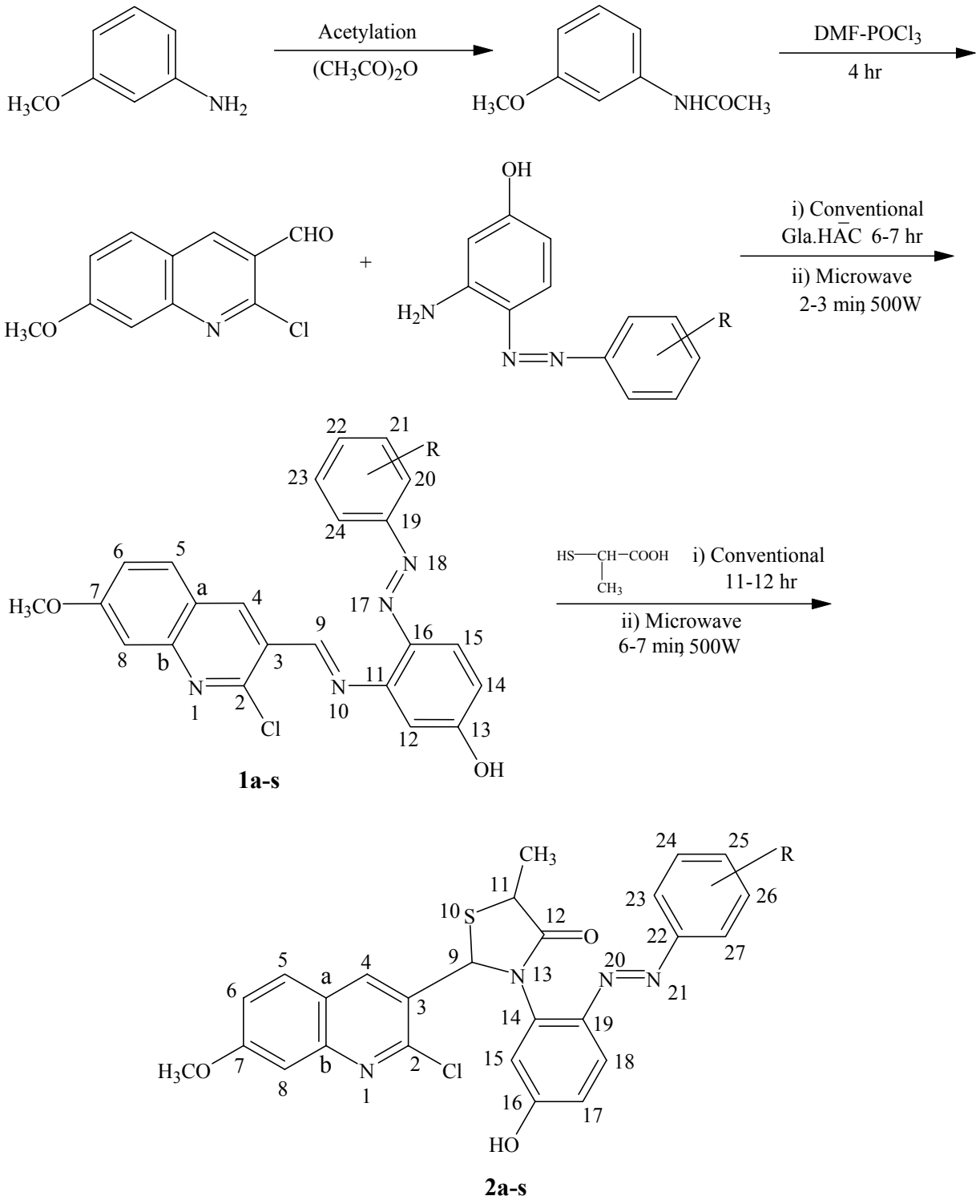
Results and Discussion

The starting compounds 2-chloro-7-methoxy-3-formylquinoline[19], was condensed with 3-amino-4-(substitutedphenyldiazenyl) phenol under microwave irradiation in one pot to furnish 3-{[(1E)-(2'-chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(substitutedphenyldiazenyl) phenols **1a-s** in good yield.

Compound, 3-{[(1E)-(2'-chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(substituted phenyldiazenyl)phenol **1a-s** upon cyclization with thiolactic acid by microwave irradiation technique yields the title compound **2a-s** in good yield. The above-mentioned compounds were also synthesized by the conventional method. It is noteworthy that the reaction which required 12 h by the conventional method, was completed within 6-7 minutes by the microwave irradiation technique and yields have been remarkably improved from 58– 78 % to 82- 91%.

Both analytical and spectroscopic data of all the synthesized compounds are in full agreement with the proposed structures.

All the compounds **2a-s** were tested for their effect on the growth of microbial cultures at concentration level ranging from 128-512 μg/mL on different organisms. The presence of fluoro, bromo or chloro group in the moiety enhances its biological activity. However, the degree of inhibition varied both with the test compound as well as with the bacterium.



Scheme 1. R= -H, 2-OCH_3, 3-OCH_3, 4-OCH_3, 2-Br, 3-Br, 4-Br, 2-Cl, 3-Cl, 4-Cl, 2-NO_2, 3-NO_2, 4- NO_2, 2-CH_3, 3-CH_3, 4-CH_3, 2-F, 3-F, 4-F

Antibacterial activity

All the compounds **2a-s** were tested for *in vitro* screening against gram-positive *Staphylococcus aureus* and gram-negative *E. coli* and *P. aeruginosa*. The minimum inhibitory concentration (MIC) was determined using tube dilution method according to the standard procedure[20] at three-test concentrations 128 μg/mL, 256 μg/mL, 512 μg/mL. Inoculums of standard suspension (0.1 mL of the test organism strain which contains 10^6 bacilli/mL) were added. The tubes were incubated at 37ºC for 48 hr and then examined for the presence or absence of growth of the organism. The lowest concentration, which showed no visible growth, was taken as an end point minimum inhibitory concentration (MIC). The MIC level of compounds **2a-s** against these organisms are given in Table 1.

An examination of the data reveals that almost all the compounds showed antimicrobial activity in good to moderate range.

Antifungal activity

The antifungal activity of compounds **2a-s** has been assayed *in vitro* at a concentration of 128 μg/mL, 256 μg/mL and 512 μg/mL against *Candida albicans*, which were maintained on nutrient agar slants, which were stored at 4ºC. None of the compounds was found to possess better activity than Dithane-M 45 (Table-1).

Antimicrobial Activity

The compounds were tested by Disk Diffusion Method on Muller Hinton Agar at concentration of 128 µg/mL, 256 µg/mL & 512 µg/mL against two Gram negative & a Gram positive bacteria and yeast. The following results were obtained

Table 1. Antimicrobial activity of compounds **2a-s**

	E. coli			P. aeruginosa			S. aureus			C. albicans		
Compd.	128 µg/mL	256 µg/mL	512 µg/mL	128 µg/mL	256 µg/mL	512 µg/mL	128 µg/mL	256 µg/mL	512 µg/mL	128 µg/mL	256 µg/mL	512 µg/mL
2a	-	-	++	-	+	++	-	-	++	-	+	++
2b	-	+	++	-	++	++	-	+	++	-	+	++
2c	-	+	++	-	++	++	-	+	++	-	+	++
2d	-	+	++	-	++	++	-	++	+++	-	+	++
2e	-	++	+++	-	+	++	-	++	+++	-	+	++
2f	-	++	+++	-	+	++	-	++	+++	-	+	++
2g	-	++	+++	-	+	++	-	++	+++	-	++	++
2h	-	++	+++	-	++	+++	-	++	+++	-	++	++
2i	-	++	+++	-	++	+++	-	++	++	-	++	++
2j	-	++	+++	-	++	+++	-	++	++	-	-	+
2k	-	+	++	-	+	++	-	++	++	-	-	+
2l	-	+	++	-	+	++	-	+	-	-	-	+
2m	-	+	++	-	+	++	-	++	+	-	-	+
2n	-	+	++	-	+	++	-	+	+	-	+	+
2o	-	+	++	-	+	++	-	-	-	-	-	-
2p	-	+	++	-	+	++	-	+	+	-	+	+
2q	-	+++	+++	+	+++	+++	+	++	+++	-	+	++
2r	-	+++	+++	+	+++	+++	-	++	+++	-	+	++
2s	-	+++	+++	+	+++	+++	+	++	+++	-	+	++
Streptomycin	++++	++++	++++	++++	++++	++++	++++	++++	++++	++++	-	-
Dithane-M 45	-	-	-	-	-	-	-	-	-	-	++++	++++

(-)< 6mm, (+) =7 – 10 mm, (++) =11 – 15mm, (+++) = 16 – 21mm, (++++) = 22 – 28mm

Experimental Section

General Procedures. Melting points were taken in open capillaries and are uncorrected. The purity of compounds was checked by TLC on silica gel 'G' coated glass plates. IR spectra were recorded in KBr on Shimadzu FTIR spectrophotometer; ^{1}H-NMR spectra ($CDCl_3$) were recorded on Brucker avance-II at 400 MHz using TMS as internal standard and ^{13}C NMR were recorded on a Varian AMX 400 spectrometer using $CDCl_3$. Mass spectra of the synthesized compounds have been recorded on a JEOL SX 102/DA-6000 spectrometer. The elemental analysis (C, H, N) of compounds was performed on a Carlo Erba-1108 elemental analyzer.

General procedure for the synthesis of substituted 3-{[(1*E*)-(2'-chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(substitutedphenyldiazenyl)phenol (1a-s)

A mixture of 2-chloro-7-methoxy-3-formylquinoline (0.01mol), 3-amino-4-(substituted phenyl diazenyl) phenol (0.01 mol) and glacial acetic acid (2 mL) was dissolved in ethanol. Then the well-stirred mixture was refluxed for 6-7 hrs (MW: 2-3 min). The reaction mixture was then cooled, poured into crushed ice and treated with sodium bisulfite solution. The product obtained was filtered, washed with water and recrystallized from ethanol.

3-{[(1*E*)-(2'-Chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(phenyldiazenyl)phenol (1a). Yield-Conventional 72% (6hr), Microwave-86% (2.5min). m.p.-254-256°C; IR (cm^{-1}): 3446 (-OH), 680 (-Cl), 1576 (-CH=N), 1570 (-C=N), 1617 (-N=N). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.25 (s, 1H, Ar-OH); 9.75 (s, 1H, -CH=N); 8.56 (s, 1H, C_4-H); 7.40-8.70 (m, 5H, $C_{20\text{-}24}$-H); 7.39 (s, 1H, C_8 -H); 7.30 (d, *J* = 8.43 Hz, 1H, C_{15}-H); 7.15 (d, *J* = 8.70 Hz, 1H, C_6-H); 7.06 (s, 1H, C_{12}-H); 7.02 (d, *J* = 8.57 Hz, 1H, C_{14}-H); 6.75 (d, *J* = 8.79 Hz, 1H, C_5-H); 3.84 (s, 3H, −O−CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 162.69 (C-OCH_3); 151.0 (C-Cl); 145.4 (C_b); 129.3 (C_a); 120.7 (CH=N); 57.09 (-OCH_3); 120.0-152.3 (Aromatic). M/S, m/z: 417 (M^+), 419 (M+2). Anal. Calcd for $C_{23}H_{17}O_2N_4Cl$: C, 66.26; H, 4.11; N, 13.44. Found: C, 66.31; H, 4.17; N, 13.49.

3-{[(1*E*)-(2'-Chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(2''-methoxyphenyldiazenyl)phenol (1b). Yield-Conventional 66% (6.5hr), Microwave-83% (3min), m.p.-182-183°C; IR (cm^{-1}): 3459 (-OH), 1224 (Ar-OCH_3), 686 (-Cl), 1579 (-CH=N), 1570 (-C=N), 1612 (-N=N). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.27 (s, 1H, Ar-OH); 9.77 (s, 1H, -CH=N); 8.60 (s, 1H, C_4-H); 7.82 (d, 1H, C_{24}-H); 7.49 (s, 1H, C_8 -H); 7.39 (dd, 1H, C_{22}-H); 7.33 (d, *J* = 8.43 Hz, 1H, C_{15}-H); 7.19 (d, *J* = 8.70 Hz, 1H, C_6-H); 7.14 (s, 1H, C_{12}-H); 7.07 (d, 1H, C_{23}-H); 7.00 (d, *J* = 8.39 Hz, 1H, C_{14}-H); 6.91 (d, 1H, C_{21}-H); 6.74 (d, *J* = 8.75 Hz, 1H, C_5-H); 3.84 (s, 3H, −O−CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 162.77 (C-OCH_3); 152.11 (C-Cl); 146.14 (C_b); 128.37 (C_a); 121.0 (CH=N); 57.54 (-OCH_3); 114.0-152.3 (Aromatic). M/S, m/z: 445 (M^+), 447 (M+2). Anal. Calcd for $C_{24}H_{19}O_3N_4Cl$: C, 64.50; H, 4.28; N, 12.53. Found: C, 64.56; H, 4.33; N, 12.57.

3-{[(1*E*)-(2'-Chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(3''-methoxyphenyl diazenyl)phenol (1c). Yield-Conventional 69% (7hr), Microwave-86% (3min), m.p.-212-214°C; IR (cm^{-1}): 3460 (-OH), 1233 (Ar-OCH_3), 684 (-Cl), 1579 (-CH=N), 1577 (-C=N), 1610 (-N=N).

^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.24 (s, 1H, Ar-OH); 9.78 (s, 1H, -CH=N); 8.57 (s, 1H, C_4-H); 7.64 (d, 1H, C_{24}-H); 7.52 (s, 1H, C_{20}-H); 7.47 (s, 1H, C_8 -H); 7.35 (d, *J* = 8.47 Hz, 1H, C_{15}-H); 7.29 (d, 1H, C_{23}-H); 7.19 (d, *J* = 8.75 Hz, 1H, C_6-H); 7.10 (s, 1H, C_{12}-H); 6.98 (d, *J* = 8.33 Hz, 1H, C_{14}-H); 6.89 (d, 1H, C_{22}-H); 6.75 (d, *J* = 8.79 Hz, 1H, C_5-H); 3.86 (s, 3H, −O−CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 161.89 (C-OCH_3); 153.20 (C-Cl); 147.95 (C_b); 127.92 (C_a); 121.09 (CH=N); 56.41 (-OCH_3); 116.0-150.64 (Aromatic). M/S, m/z: 445 (M^+), 447 (M+2). Anal. Calcd for $C_{24}H_{19}O_3N_4Cl$: C, 64.50; H, 4.28; N, 12.53. Found: C, 64.57; H, 4.30; N, 12.59.

3-{[(1*E*)-(2'-Chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(4''-methoxyphenyl diazenyl)phenol (1d). Yield-Conventional 72% (7hr), Microwave-86% (2.5min), m.p.-174-175°C; IR (cm^{-1}): 3460 (-OH), 1235 (Ar-OCH_3), 676 (-Cl), 1582 (-CH=N), 1571 (-C=N), 1610 (-N=N). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.27 (s, 1H, Ar-OH); 9.72 (s, 1H, -CH=N); 8.55 (s, 1H, C_4-H); 7.82 (d, 2H, $C_{20\text{-}24}$-H); 7.47 (s, 1H, C_8 -H); 7.37 (d, *J* = 8.47 Hz, 1H, C_{15}-H); 7.29 (d, 2H, $C_{21\text{-}23}$-H); 7.23 (d, *J* = 8.70 Hz, 1H, C_6-H); 7.12 (s, 1H, C_{12}-H); 6.98 (d, *J* = 8.33 Hz, 1H, C_{14}-H); 6.75 (d, *J* = 8.75 Hz, 1H, C_5-H); 3.86 (s, 3H, −O−CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 162.74 (C-OCH_3); 153.38 (C-Cl); 147.45 (C_b); 127.69 (C_a); 121.12 (CH=N); 57.09 (-OCH_3); 121.0-155.37 (Aromatic). M/S, m/z: 445 (M^+), 447 (M+2). Anal. Calcd for $C_{24}H_{19}O_3N_4Cl$: C, 64.50; H, 4.28; N, 12.53. Found: C, 64.53; H, 4.35; N, 12.55.

3-{[(1*E*)-(2'-chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(2''-bromophenyldiazenyl) phenol (1e). Yield-Conventional 67%(6hr), Microwave-86% (2min), m.p.-212-213°C; IR (cm^{-1}): 3455 (-OH), 712 (Ar-Br), 681 (-Cl), 1570 (-CH=N), 1565 (-C=N), 1614 (-N=N). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.20 (s, 1H, Ar-OH); 9.82 (s, 1H, -CH=N); 8.66 (s, 1H, C_4-H); 7.83 (d, 1H, C_{24}-H); 7.52 (s, 1H, C_8 -H); 7.41 (dd, 1H, C_{22}-H); 7.35 (d, *J* = 8.43 Hz, 1H, C_{15}-H); 7.17 (d, *J* = 8.62 Hz, 1H, C_6-H); 7.10 (s, 1H, C_{12}-H); 7.06 (d, *J* = 8.43 Hz, 1H, C_{14}-H); 7.00 (d, 1H, C_{23}-H); 6.97 (d, 1H, C_{21}-H); 6.71 (d, *J* = 8.70 Hz, 1H, C_5-H); 3.82 (s, 3H, −O−CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 162.70 (C-OCH_3); 153.78 (C-Cl); 146.10 (C_b); 126.99 (C_a); 121.22 (CH=N); 57.54 (-OCH_3); 111.0-151.04 (Aromatic). M/S, m/z: 496 (M^+), 500 (M+4). Anal. Calcd for $C_{23}H_{16}O_2N_4ClBr$: C, 55.72; H, 3.25; N, 11.30. Found: C, 55.77; H, 3.30; N, 11.35.

3-{[(1*E*)-(2'-Chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(3''-bromophenyldiazenyl)phenol (1f). Yield-Conventional 70% (7hr), Microwave-89% (3min), m.p.-194-195°C; IR (cm^{-1}): 3460 (-OH), 710 (Ar-Br), 680 (-Cl), 1575 (-CH=N), 1561(-C=N), 1614 (-N=N). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.29 (s, 1H, Ar-OH); 9.78 (s, 1H, -CH=N); 8.57 (s, 1H, C_4-H); 7.60 (d, 1H, C_{24}-H); 7.49 (s, 1H, C_8 -H); 7.43 (s, 1H, C_{20}-H); 7.39 (d, *J* = 8.43 Hz, 1H, C_{15}-H); 7.29 (d, 1H, C_{23}-H); 7.17 (d, *J* = 8.70 Hz, 1H, C_6-H); 7.10 (s, 1H, C_{12}-H); 6.95 (d, *J* = 8.47 Hz, 1H, C_{14}-H); 6.89 (d, 1H, C_{22}-H); 6.78 (d, *J* = 8.70 Hz, 1H, C_5-H); 3.86 (s, 3H, −O−CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 161.98 (C-OCH_3); 153.20 (C-Cl); 149.90 (C_b); 125.07 (C_a); 121.09 (CH=N); 56.41 (-OCH_3); 116.0-158.78 (Aromatic). M/S, m/z: 496 (M^+), 500 (M+4). Anal. Calcd for $C_{23}H_{16}O_2N_4ClBr$: C, 55.72; H, 3.25; N, 11.30. Found: C, 55.78; H, 3.31; N, 11.33.

3-{[(1*E*)-(2'-Chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(4''-bromophenyldiazenyl) phenol (1g). Yield-Conventional 58% (6.5hr), Microwave-75% (3min), m.p.-237-240°C; IR (cm^{-1}): 3466 (-OH), 712 (Ar-Br), 676 (-Cl), 1588 (-CH=N), 1576(-C=N), 1612 (-N=N). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.27 (s, 1H, Ar-OH); 9.72 (s, 1H, -CH=N); 8.60 (s, 1H, C_4-H); 7.82 (d, 2H, $C_{20\text{-}24}$-H); 7.45 (s, 1H, C_8 -H); 7.35 (d, *J* = 8.43 Hz, 1H, C_{15}-H); 7.28 (d, 2H, $C_{21\text{-}23}$-H); 7.18 (d, *J* = 8.79 Hz, 1H, C_6-H); 7.10 (s, 1H, C_{12}-H); 6.94 (d, *J* = 8.43 Hz, 1H, C_{14}-H); 6.71 (d, *J* = 8.70 Hz, 1H, C_5-H); 3.80 (s, 3H, −O−CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 161.30 (C-OCH_3); 153.25 (C-Cl); 147.45 (C_b); 125.66 (C_a); 121.12 (CH=N); 57.09 (-OCH_3); 114.0-155.54 (Aromatic). M/S, m/z: 496 (M^+), 500 (M+4). Anal. Calcd for $C_{23}H_{16}O_2N_4ClBr$: C, 55.72; H, 3.25; N, 11.30. Found: C, 55.75; H, 3.28; N, 11.37.

3-{[(1*E*)-(2'-Chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(2''-chlorophenyldiazenyl) phenol (1h). Yield-Conventional 61% (6hr), Microwave-80% (2.5min), m.p.-202-203°C; IR (cm^{-1}): 3455 (-OH), 681 (-Cl), 1577 (-CH=N), 1565 (-C=N), 1610 (-N=N). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.29 (s, 1H, Ar-OH); 9.81 (s, 1H, -CH=N); 8.63 (s, 1H, C_4-H); 7.88 (d, 1H, C_{24}-H); 7.51 (s, 1H, C_8 -H); 7.44 (dd, 1H, C_{22}-H); 7.33 (d, *J* = 8.43 Hz, 1H, C_{15}-H); 7.20 (d, *J* = 8.79 Hz, 1H, C_6-H); 7.14 (s, 1H, C_{12}-H); 7.07 (d, 1H, C_{23}-H); 7.02 (d, *J* = 8.43 Hz, 1H, C_{14}-H); 6.95 (d, 1H, C_{21}-H); 6.71 (d, *J* = 8.70 Hz, 1H, C_5-H); 3.86 (s, 3H, −O−CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 161.27 (C-OCH_3); 153.78 (C-Cl); 149.91 (C_b); 126.99 (C_a); 120.09 (CH=N); 57.54 (-OCH_3); 110.09-150.77 (Aromatic). M/S, m/z: 451 (M^+), 455 (M+4). Anal. Calcd for $C_{23}H_{16}O_2N_4Cl_2$: C, 61.21; H, 3.57; N, 12.41. Found: C, 61.25; H, 3.62; N, 12.47.

3-{[(1E)-(2'-Chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(3''-chlorophenyldiazenyl) phenol (1i). Yield-Conventional 65% (7hr), Microwave-89% (3min), m.p.-244-245°C; IR (cm^{-1}): 3460 (-OH), 684 (-Cl), 1582 (-CH=N), 1560 (-C=N), 1610 (-N=N). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.24 (s, 1H, Ar-OH); 9.78 (s, 1H, -CH=N); 8.55 (s, 1H, C_4-H); 7.62 (d, 1H, C_{24}-H); 7.54 (s, 1H, C_8 -H); 7.47 (s, 1H, C_{20}-H); 7.37 (d, *J* = 8.47 Hz, 1H, C_{15}-H); 7.30 (d, 1H, C_{23}-H); 7.19 (d, *J* = 8.79 Hz, 1H, C_6-H); 7.12 (s, 1H, C_{12}-H); 6.96 (d, *J* = 8.43 Hz, 1H, C_{14}-H); 6.89 (d, 1H, C_{22}-H); 6.78 (d, *J* = 8.79 Hz, 1H, C_5-H); 3.86 (s, 3H, −O−CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 161.89 (C-OCH_3); 153.25 (C-Cl); 147.95 (C_b); 127.92 (C_a); 121.22 (CH=N); 56.41 (-OCH_3); 111.0-156.64 (Aromatic). M/S, m/z: 451 (M^+), 455 (M+4). Anal. Calcd for $C_{23}H_{16}O_2N_4Cl_2$: C, 61.21; H, 3.57; N, 12.41. Found: C, 61.27; H, 3.65; N, 12.44.

3-{[(1*E*)-(2'-Chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(4''-chlorophenyldiazenyl) phenol (1j). Yield-Conventional 60% (6.5hr), Microwave-78% (2.5min), m.p.-274-275°C; IR (cm^{-1}): 3466 (-OH), 676 (-Cl), 1588 (-CH=N), 1575(-C=N), 1612 (-N=N). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.21 (s, 1H, Ar-OH); 9.72 (s, 1H, -CH=N); 8.59 (s, 1H, C_4-H); 7.82 (d, 2H, $C_{20\text{-}24}$-H); 7.45 (s, 1H, C_8 -H); 7.39 (d, *J* = 8.57 Hz, 1H, C_{15}-H); 7.28 (d, 2H, $C_{21\text{-}23}$-H); 7.20 (d, *J* = 8.75 Hz, 1H, C_6-H); 7.11 (s, 1H, C_{12}-H); 6.95 (d, *J* = 8.33 Hz, 1H, C_{14}-H); 6.77 (d, *J* = 8.75 Hz, 1H, C_5-H); 3.81 (s, 3H, −O−CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 161.30 (C-OCH_3); 153.38 (C-Cl); 147.45 (C_b); 127.69 (C_a); 121.22 (CH=N); 57.09 (-OCH_3); 120.09-155.22 (Aromatic). M/S, m/z: 451 (M^+), 455 (M+4). Anal. Calcd for $C_{23}H_{16}O_2N_4Cl_2$: C, 61.21; H, 3.57; N, 12.41. Found: C, 61.25; H, 3.65; N, 12.45.

3-{[(1*E*)-(2'-Chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(2''-nitrophenyldiazenyl) phenol (1k). Yield-Conventional 66% (6.5hr), Microwave-82% (3min), m.p.-159-161°C; IR (cm^{-1}): 3452 (-OH), 1340 (Ar-NO_2), 681 (-Cl), 1577 (-CH=N), 1565 (-C=N), 1612 (-N=N). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.30 (s, 1H, Ar-OH); 9.82 (s, 1H, -CH=N); 8.66 (s, 1H, C_4-H); 7.88 (d, 1H, C_{24}-H); 7.51 (s, 1H, C_8 -H); 7.47 (dd, 1H, C_{22}-H); 7.33 (d, *J* = 8.43 Hz, 1H, C_{15}-H); 7.21 (d, *J* = 8.70 Hz, 1H, C_6-H); 7.12 (s, 1H, C_{12}-H); 7.08 (d, 1H, C_{23}-H); 7.00 (d, *J* = 8.43 Hz, 1H, C_{14}-H); 6.95 (d, 1H, C_{21}-H); 6.71 (d, *J* = 8.79 Hz, 1H, C_5-H); 3.87 (s, 3H, −O−CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 162.77 (C-OCH_3); 152.11 (C-Cl); 146.14 (C_b); 128.37 (C_a); 121.7 (CH=N); 57.54 (-OCH_3); 110.0-152.3 (Aromatic). M/S, m/z: 462 (M^+), 464 (M+2). Anal. Calcd for $C_{23}H_{16}O_4N_5Cl$: C, 59.81; H, 3.49; N, 15.16. Found: C, 59.88; H, 3.53; N, 15.23.

3-{[(1*E*)-(2'-Chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(3''-nitrophenyldiazenyl) phenol (1l). Yield-Conventional 67% (7hr), Microwave-89% (3min), m.p.-294-295°C; IR (cm^{-1}): 3460 (-OH), 1345 (Ar-NO_2), 685(-Cl), 1578 (-CH=N), 1568 (-C=N), 1614 (-N=N). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.29 (s, 1H, Ar-OH); 9.74 (s, 1H, -CH=N); 8.58 (s, 1H, C_4-H); 7.60 (d, 1H, C_{24}-H); 7.49 (s, 1H, C_8 -H); 7.45 (s, 1H, C_{20}-H); 7.39 (d, *J* = 8.47 Hz, 1H, C_{15}-H); 7.29 (d, 1H, C_{23}-H); 7.19 (d, *J* = 8.79 Hz, 1H, C_6-H); 7.11 (s, 1H, C_{12}-H); 6.99 (d, *J* = 8.49 Hz, 1H, C_{14}-H); 6.89 (d, 1H, C_{22}-H); 6.78 (d, *J* = 8.79 Hz, 1H, C_5-H); 3.88 (s, 3H, −O−CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 161.89 (C-OCH_3); 153.20 (C-Cl); 149.90 (C_b); 127.92 (C_a); 120.70 (CH=N); 56.41 (-OCH_3); 121.0-158.78 (Aromatic). M/S, m/z: 462 (M^+), 464 (M+2). Anal. Calcd for $C_{23}H_{16}O_4N_5Cl$: C, 59.81; H, 3.49; N, 15.16. Found: C, 59.85; H, 3.55; N, 15.20.

3-{[(1*E*)-(2'-Chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(4''-nitrophenyldiazenyl) phenol (1m). Yield-Conventional 56% (7hr), Microwave-75% (3min), m.p.-174-176°C; IR (cm^{-1}): 3461 (-OH), 1340 (Ar-NO_2), 676 (-Cl), 1585 (-CH=N), 1575(-C=N), 1608 (-N=N). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.27 (s, 1H, Ar-OH); 9.72 (s, 1H, -CH=N); 8.58 (s, 1H, C_4-H); 7.80 (d, 2H, $C_{20\text{-}24}$-H); 7.46 (s, 1H, C_8 -H); 7.40 (d, *J* = 8.40 Hz, 1H, C_{15}-H); 7.30 (d, 2H, $C_{21\text{-}23}$-H); 7.18 (d, *J* = 8.62 Hz, 1H, C_6-H); 7.09 (s, 1H, C_{12}-H); 6.95 (d, *J* = 8.43 Hz, 1H, C_{14}-H); 6.77 (d, *J* = 8.70 Hz, 1H, C_5-H); 3.85 (s, 3H, −O−CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 162.74 (C-OCH_3); 153.38 (C-Cl); 147.45 (C_b); 127.69 (C_a); 121.12 (CH=N); 57.09 (-OCH_3); 119.0-153.30 (Aromatic). M/S, m/z: 462 (M^+), 464 (M+2). Anal. Calcd for $C_{23}H_{16}O_4N_5Cl$: C, 59.81; H, 3.49; N, 15.16. Found: C, 59.85; H, 3.53; N, 15.22.

3-{[(1*E*)-(2'-Chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(2''-methylphenyldiazenyl) phenol (1n). Yield-Conventional 61% (6hr), Microwave-78% (2min), m.p.-189-190°C; IR (cm^{-1}): 3452 (-OH), 2917 (Ar-CH_3), 681 (-Cl), 1575 (-CH=N), 1560 (-C=N), 1610 (-N=N). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.27 (s, 1H, Ar-OH); 9.82 (s, 1H, -CH=N); 8.61 (s, 1H, C_4-H); 7.88 (d, 1H, C_{24}-H); 7.51 (s, 1H, C_8 -H); 7.44 (dd, 1H, C_{22}-H); 7.35 (d, *J* = 7.98 Hz, 1H, C_{15}-H); 7.21 (d, *J* = 8.79 Hz, 1H, C_6-H); 7.14 (s, 1H, C_{12}-H); 7.09 (d, 1H, C_{23}-H); 7.02 (d, *J* = 8.40 Hz, 1H, C_{14}-H); 6.95 (d, 1H, C_{21}-H); 6.70 (d, *J* = 8.75 Hz, 1H, C_5-H); 3.85 (s, 3H, −O−CH_3); 2.80 (s, 3H, Ar-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 162.77 (C-OCH_3);

153.20 (C-Cl); 149.91 (C_b); 126.99 (C_a); 120.70 (CH=N); 57.54 (-OCH_3); 21.99 (-CH_3); 110.09-157.77 (Aromatic). M/S, m/z: 431 (M^+), 433 (M+2). Anal. Calcd for $C_{24}H_{19}O_2N_4Cl$: C, 66.89; H, 4.44; N, 13.00. Found: C, 66.95; H, 4.49; N, 13.08.

3-{[(1*E*)-(2'-Chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(3''-methylphenyldiazenyl) phenol (1o). Yield-Conventional 63% (6.5hr), Microwave-83% (2.5min), m.p.-219-220°C; IR (cm^{-1}): 3461 (-OH), 2920 (Ar-CH_3), 685(-Cl), 1578 (-CH=N), 1563 (-C=N), 1610(-N=N). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.29 (s, 1H, Ar-OH); 9.77 (s, 1H, -CH=N); 8.58 (s, 1H, C_4-H); 7.60 (d, 1H, C_{24}-H); 7.49 (s, 1H, C_8 -H); 7.45 (s, 1H, C_{20}-H); 7.40 (d, *J* = 8.43 Hz, 1H, C_{15}-H); 7.30 (d, 1H, C_{23}-H); 7.19 (d, *J* = 8.62 Hz, 1H, C_6-H); 7.10 (s, 1H, C_{12}-H); 6.97 (d, *J* = 8.43 Hz, 1H, C_{14}-H); 6.90 (d, 1H, C_{22}-H); 6.75 (d, *J* = 8.70 Hz, 1H, C_5-H); 3.86 (s, 3H, −O−CH_3); 2.75 (s, 3H, Ar-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 161.98 (C-OCH_3); 153.20 (C-Cl); 149.90 (C_b); 127.92 (C_a); 121.09 (CH=N); 56.41 (-OCH_3); 22.3 (-CH_3); 116.0-155.78 (Aromatic). M/S, m/z: 431 (M^+), 433 (M+2). Anal. Calcd for $C_{24}H_{19}O_2N_4Cl$: C, 66.89; H, 4.44; N, 13.00. Found: C, 66.93; H, 4.49; N, 13.05.

3-{[(1*E*)-(2'-Chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(4''-methylphenyldiazenyl) phenol (1p). Yield-Conventional 55% (7hr), Microwave-74% (3min), m.p.-168-170°C; IR (cm^{-1}): 3460 (-OH), 2922 (Ar-CH_3), 678 (-Cl), 1588 (-CH=N), 1575(-C=N), 1610 (-N=N). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.22 (s, 1H, Ar-OH); 9.71 (s, 1H, -CH=N); 8.60 (s, 1H, C_4-H); 7.79 (d, 2H, $C_{20\text{-}24}$-H); 7.45 (s, 1H, C_8 -H); 7.39 (d, *J* = 8.43 Hz, 1H, C_{15}-H); 7.28 (d, 2H, $C_{21\text{-}23}$-H); 7.18 (d, *J* = 8.79 Hz, 1H, C_6-H); 7.11 (s, 1H, C_{12}-H); 6.99 (d, *J* = 8.43 Hz, 1H, C_{14}-H); 6.78 (d, *J* = 8.79 Hz, 1H, C_5-H); 3.87 (s, 3H, −O−CH_3); 2.77 (s, 3H, Ar-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 161.30 (C-OCH_3); 153.25 (C-Cl); 147.45 (C_b); 125.66 (C_a); 121.12 (CH=N); 57.09 (-OCH_3); 22.3 (-CH_3); 111.0-155.54 (Aromatic). M/S, m/z: 431 (M^+), 433 (M+2). Anal. Calcd for $C_{24}H_{19}O_2N_4Cl$: C, 66.89; H, 4.44; N, 13.00. Found: C, 66.95; H, 4.47; N, 13.07.

3-{[(1*E*)-(2'-Chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(2''-fluorophenyldiazenyl) phenol (1q). Yield-Conventional 62% (6.5hr), Microwave-88% (2.5min), m.p.-173-174°C; IR (cm^{-1}): 3455 (-OH), 776 (Ar-F), 680 (-Cl), 1577 (-CH=N), 1560 (-C=N), 1610 (-N=N). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.27 (s, 1H, Ar-OH); 9.81 (s, 1H, -CH=N); 8.68 (s, 1H, C_4-H); 7.84 (d, 1H, C_{24}-H); 7.50 (s, 1H, C_8 -H); 7.41 (dd, 1H, C_{22}-H); 7.35 (d, *J* = 7.89 Hz, 1H, C_{15}-H); 7.21 (d, *J* = 8.75 Hz, 1H, C_6-H); 7.13 (s, 1H, C_{12}-H); 7.07 (d, *J* = 8.33 Hz, 1H, C_{14}-H); 6.99 (d, 1H, C_{23}-H); 6.94 (d, 1H, C_{21}-H); 6.73 (d, *J* = 8.79 Hz, 1H, C_5-H); 3.82 (s, 3H, −O−CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 161.30 (C-OCH_3); 152.11 (C-Cl); 149.91 (C_b); 128.37 (C_a); 121.0 (CH=N); 57.54 (-OCH_3); 119.0-152.3 (Aromatic). M/S, m/z: 435 (M^+), 437 (M+2). Anal. Calcd for $C_{23}H_{16}O_2N_4ClF$: C, 63.52; H, 3.70; N, 12.88. Found: C, 63.55; H, 3.75; N, 12.95.

3-{[(1*E*)-(2'-Chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(3''-fluorophenyldiazenyl) phenol (1r). Yield-Conventional 60% (6hr), Microwave-87% (3min), m.p.-184-185°C; IR (cm^{-1}): 3462 (-OH), 774 (Ar-F), 680 (-Cl), 1577 (-CH=N), 1561(-C=N), 1612 (-N=N). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.27 (s, 1H, Ar-OH); 9.75 (s, 1H, -CH=N); 8.57

(s, 1H, C_4-H); 7.61 (d, 1H, C_{24}-H); 7.49 (s, 1H, C_8 -H); 7.43 (s, 1H, C_{20}-H); 7.35 (d, *J* = 8.43 Hz, 1H, C_{15}-H); 7.29 (d, 1H, C_{23}-H); 7.19 (d, *J* = 8.62 Hz, 1H, C_6-H); 7.10 (s, 1H, C_{12}-H); 6.95 (d, *J* = 8.39 Hz, 1H, C_{14}-H); 6.89 (d, 1H, C_{22}-H); 6.78 (d, *J* = 8.75 Hz, 1H, C_5-H); 3.88 (s, 3H, −O−CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 161.89 (C-OCH_3); 153.20 (C-Cl); 147.95 (C_b); 127.92 (C_a); 121.09 (CH=N); 57.54 (-OCH_3); 116.0-153.64 (Aromatic). M/S, m/z: 435 (M^+), 437 (M+2). Anal. Calcd for $C_{23}H_{16}O_2N_4ClF$: C, 63.52; H, 3.70; N, 12.88. Found: C, 63.57; H, 3.75; N, 12.93.

3-{[(1*E*)-(2'-Chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(4''-fluorophenyldiazenyl) phenol (1s). Yield-Conventional 69% (7hr), Microwave-81% (3min), m.p.-225-226°C; IR (cm^{-1}): 3460 (-OH), 774 (Ar-F), 676 (-Cl), 1582 (-CH=N), 1570 (-C=N), 1612 (-N=N). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.29 (s, 1H, Ar-OH); 9.77 (s, 1H, -CH=N); 8.55 (s, 1H, C_4-H); 7.80 (d, 2H, $C_{20\text{-}24}$-H); 7.47 (s, 1H, C_8 -H); 7.37 (d, *J* = 8.47 Hz, 1H, C_{15}-H); 7.29 (d, 2H, $C_{21\text{-}23}$-H); 7.22 (d, *J* = 8.79 Hz, 1H, C_6-H); 7.10 (s, 1H, C_{12}-H); 6.98 (d, *J* = 8.43 Hz, 1H, C_{14}-H); 6.78 (d, *J* = 8.70 Hz, 1H, C_5-H); 3.86 (s, 3H, −O−CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 161.30 (C-OCH_3); 153.25 (C-Cl); 147.45 (C_b); 125.66 (C_a); 121.12 (CH=N); 57.09 (-OCH_3); 119.0-155.54 (Aromatic). M/S, m/z: 435 (M^+), 437 (M+2). Anal. Calcd for $C_{23}H_{16}O_2N_4ClF$: C, 63.52; H, 3.70; N, 12.88. Found: C, 63.55; H, 3.74; N, 12.98.

General procedure for the synthesis of 2-[(2'-chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(substitutedphenyldiazenyl)phenyl]-5-methyl-1,3-thiazolidin-4-one (2a-s)

A mixture of 3-{[(1E)-(2'-chloro-7'-methoxyquinoline-3'-yl)methylene]amino}-4-(substitutedphenyl diazenyl)phenol **1a-s** (0.01mol) and thiolactic acid (0.01mol) in DMF was heated at 120-125°C for 11-12 hours (MW:6-7). The reaction mixture was cooled and treated with 10% sodium bicarbonate solution. The product obtained was filtered, washed several times with water and recrystallized from ethanol.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(phenyldiazenyl)phenyl]-5-methyl-1,3-thiazolidin-4-one (2a). Yield-Conventional 70% (11.5hr), Microwave-91% (6min), m.p.-225-226°C; IR (cm^{-1}): 3475 (-OH), 692 (-Cl), 1729 (C=O, thiazolidinone), 1571 (C=N), 1604 (N=N), 620 (C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 9.37 (s, 1H, Ar-OH); 8.17-8.81 (m, 5H, $C_{23\text{-}27}$-H); 8.10 (s, 1H, C_8-H); 7.97 (s, 1H, C_4-H); 7.60 (d, *J* = 8.79 Hz, 1H, C_5-H); 7.51 (d, *J* = 8.79 Hz, 1H, C_6-H); 7.33 (s, 1H, C_{15}-H); 7.10 (d, *J* = 8.43 Hz, 1H, C_{17}-H); 6.83 (d, *J* = 8.43 Hz, 1H, C_{18}-H); 4.30 (q, *J* = 7.2 Hz, 1H, CH-CH_3); 4.22 (s, 1H, -CH-N); 3.86 (s, 3H, -OCH_3); 1.35 (d, *J* = 7.1 Hz, 3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 177.70 (C=O, thiazolidinone), 160.10 (C-OCH_3); 152.40 (C-Cl); 146.50 (C_b); 122.20 (C_a); 57.09 (-OCH_3); 41.6 (CHS, thiazolidinone); 41.0 (CH-CH_3, thiazolidinone); 18.30 (CH-CH_3, thiazolidinone); 111.0-155.54 (Aromatic). M/S, m/z: 505 (M^+), 507 (M+2). Anal. Calcd for $C_{26}H_{21}O_3N_4SCl$: C, 61.83; H, 4.19; N, 11.09. Found: C, 61.88; H, 4.23; N, 11.13.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(2'''-methoxyphenyldiazenyl) phenyl]-5-methyl-1,3-thiazolidin-4-one (2b). Yield-Conventional 58% (11hr), Microwave-82% (6.5min), m.p.-198-200°C; IR (cm^{-1}): 3471 (-OH), 684(-Cl), 1235 (Ar-OCH_3), 1730 (C=O,

thiazolidinone), 1571 (C=N), 1600 (N=N), 623 (C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 9.37 (s, 1H, Ar-OH); 8.11 (s, 1H, C_8-H); 7.89 (s, 1H, C_4-H); 7.82 (d, 1H, C_{27}-H); 7.61 (d, *J* = 8.69 Hz, 1H, C_5-H); 7.50 (d, *J* = 8.80 Hz, 1H, C_6-H); 7.35 (dd, 1H, C_{25}-H); 7.31 (s, 1H, C_{15}-H); 7.09 (d, *J* = 8.47 Hz, 1H, C_{17}-H); 7.02 (d, 1H, C_{26}-H); 6.97 (d, 1H, C_{24}-H); 6.87 (d, *J* = 8.43 Hz, 1H, C_{18}-H); 4.35 (q, *J* = 7.1 Hz, 1H, CH-CH_3); 4.20 (s, 1H, -CH-N); 3.84 (s, 3H, -OCH_3); 1.37 (d, *J* = 7.1 Hz, 3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 177.87 (C=O, thiazolidinone), 161.30 (C-OCH_3); 154.99 (C-Cl); 148.47 (C_b); 122.54 (C_a); 57.09 (-OCH_3); 41.90 (CHS, thiazolidinone); 41.11 (CH-CH_3, thiazolidinone); 18.33 (CH-CH_3, thiazolidinone); 121.0-155.37 (Aromatic). M/S, m/z: 535 (M^+), 537 (M+2). Anal. Calcd for $C_{27}H_{23}O_4N_4SCl$: C, 60.61; H, 4.33; N, 10.47. Found: C, 60.67; H, 4.39; N, 10.51.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(3'''-methoxyphenyldiazenyl) phenyl]-5-methyl-1,3-thiazolidin-4-one (2c). Yield-Conventional 67% (12hr), Microwave-85% (6min), m.p.-175-176°C; IR (cm^{-1}): 3475 (-OH), 684 (-Cl), 1239 (Ar-OCH_3), 1731 (C=O, thiazolidinone), 1580 (C=N), 1611 (N=N), 623 (C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 9.37 (s, 1H, Ar-OH); 8.11 (s, 1H, C_8-H); 7.93 (s, 1H, C_4-H); 7.63 (d, *J* = 8.79 Hz, 1H, C_5-H); 7.51 (d, *J* = 8.64 Hz, 1H, C_6-H); 7.49 (d, 1H, C_{27}-H); 7.44 (s, 1H, C_{23}-H); 7.38 (d, 1H, C_{26}-H); 7.31 (s, 1H, C_{15}-H); 7.07 (d, *J* = 8.39 Hz, 1H, C_{17}-H); 6.97 (d, 1H, C_{25}-H); 6.83 (d, *J* = 8.43 Hz, 1H, C_{18}-H); 4.30 (q, *J* = 7.1 Hz,1H, CH-CH_3); 4.21 (s, 1H, -CH-N); 3.84 (s, 3H, -OCH_3); 1.33 (d, *J* = 7.2 Hz, 3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 177.7 (C=O, thiazolidinone), 160.30 (C-OCH_3); 153.04 (C-Cl); 146.95 (C_b); 124.22 (C_a); 56.41 (-OCH_3); 42.07 (CHS, thiazolidinone); 41.15 (CH-CH_3, thiazolidinone); 18.30 (CH-CH_3, thiazolidinone); 119.0-153.30 (Aromatic). M/S, m/z: 535 (M^+), 537 (M+2). Anal. Calcd for $C_{27}H_{23}O_4N_4SCl$: C, 60.61; H, 4.33; N, 10.47. Found: C, 60.65; H, 4.40; N, 10.50.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(4'''-methoxyphenyldiazenyl) phenyl]-5-methyl-1,3-thiazolidin-4-one (2d). Yield-Conventional 63% (11hr), Microwave-88% (7min), m.p.-204-206°C; IR (cm^{-1}): 3475 (-OH), 684 (-Cl), 1240 (Ar-OCH_3), 1737 (C=O, thiazolidinone), 1584(C=N), 1602 (N=N), 620 (C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 9.37 (s, 1H, Ar-OH); 8.12 (s, 1H, C_8-H); 7.90 (s, 1H, C_4-H); 7.78 (d, 2H, $C_{23,27}$-H); 7.60 (d, *J* = 8.70 Hz, 1H, C_5-H); 7.51 (d, *J* = 8.79 Hz, 1H, C_6-H); 7.40 (d, 2H, $C_{24,26}$-H); 7.30 (s, 1H, C_{15}-H); 7.07 (d, *J* = 8.40 Hz, 1H, C_{17}-H); 6.88 (d, *J* = 8.47 Hz, 1H, C_{18}-H); 4.34 (q, *J* = 7.3 Hz, 1H, CH-CH_3); 4.21 (s, 1H, -CH-N); 3.84 (s, 3H, -OCH_3); 1.36 (d, *J* = 7.1 Hz, 3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 178.21 (C=O, thiazolidinone), 160.98 (C-OCH_3); 153.14 (C-Cl); 148.47 (C_b); 125.09 (C_a); 57.54 (-OCH_3); 41.90 (CHS, thiazolidinone); 40.87 (CH-CH_3, thiazolidinone); 19.01 (CH-CH_3, thiazolidinone); 121.0-158.78 (Aromatic). M/S, m/z: 535 (M^+), 537 (M+2). Anal. Calcd for $C_{27}H_{23}O_4N_4SCl$: C, 60.61; H, 4.33; N, 10.47. Found: C, 60.65; H, 4.36; N, 10.56.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(2'''-bromophenyldiazenyl) phenyl]-5-methyl-1,3-thiazolidin-4-one (2e). Yield-Conventional 73% (12hr), Microwave-90% (7min), m.p.-209-208°C; IR (cm^{-1}): 3471 (-OH), 684 (-Cl), 716 (Ar-Br), 1730(C=O, thiazolidinone), 1571 (C=N), 1600 (N=N), 623 (C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 9.37 (s, 1H, Ar-OH); 8.11 (s, 1H, C_8-H); 7.89 (s, 1H, C_4-H); 7.85 (d, 1H, C_{27}-H); 7.61 (d, *J* = 8.64 Hz,

1H, C_5-H); 7.50 (d, *J* = 8.69 Hz, 1H, C_6-H); 7.37 (dd, 1H, C_{25}-H); 7.31 (s, 1H, C_{15}-H); 7.09 (d, *J* = 8.40 Hz, 1H, C_{17}-H); 7.02 (d, 1H, C_{26}-H); 6.95 (d, 1H, C_{24}-H); 6.87 (d, *J* = 8.43 Hz, 1H, C_{18}-H); 4.35 (q, *J* = 7.1 Hz, 1H, CH-CH_3); 4.20 (s, 1H, -CH-N); 3.84 (s, 3H, -OCH_3); 1.37 (d, *J* = 7.0 Hz, 3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 177.87 (C=O, thiazolidinone), 161.20 (C-OCH_3); 152.36 (C-Cl); 148.58 (C_b); 125.01 (C_a); 57.09 (-OCH_3); 41.60 (CHS, thiazolidinone); 41.00 (CH-CH_3, thiazolidinone); 18.34 (CH-CH_3, thiazolidinone); 121.0-155.37 (Aromatic). M/S, m/z: 584 (M^+), 588 (M+4). Anal. Calcd for $C_{26}H_{20}O_3N_4SClBr$: C, 53.48; H, 3.45; N, 9.60. Found: C, 53.52; H, 3.52; N, 9.64.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(3'''-bromophenyldiazenyl) phenyl] -5-methyl-1,3-thiazolidin-4-one (2f). Yield-Conventional 68% (11hr), Microwave-86% (6min), m.p.-250-252°C; IR (cm^{-1}): 3475 (-OH), 680 (-Cl), 710 (Ar-Br), 1731(C=O, thiazolidinone), 1580 (C=N), 1602 (N=N), 622 (C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 9.37 (s, 1H, Ar-OH); 8.11 (s, 1H, C_8-H); 7.91 (s, 1H, C_4-H);); 7.63 (d, *J* = 8.79 Hz, 1H, C_5-H); 7.56 (s, 1H, C_{27}-H); 7.49 (d, *J* = 8.79 Hz, 1H, C_6-H); 7.42 (s, 1H, C_{23}-H); 7.38 (d, 1H, C_{26}-H); 7.29 (s, 1H, C_{15}-H); 7.10 (d, *J* = 8.29 Hz, 1H, C_{17}-H); 6.92 (d, 1H, C_{25}-H); 6.83 (d, *J* = 8.39 Hz, 1H, C_{18}-H); 4.30 (q, *J* = 6.8 Hz, 1H, CH-CH_3); 4.20 (s, 1H, -CH-N); 3.84 (s, 3H, -OCH_3); 1.33 (d, *J* = 7.1 Hz, 3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 177.76 (C=O, thiazolidinone), 162.41 (C-OCH_3); 152.40 (C-Cl); 148.55 (C_b); 125.09 (C_a); 57.09 (-OCH_3); 41.66 (CHS, thiazolidinone); 40.96 (CH-CH_3, thiazolidinone); 19.01 (CH-CH_3, thiazolidinone); 110.0-152.30 (Aromatic). M/S, m/z: 584 (M^+), 588 (M+4). Anal. Calcd for $C_{26}H_{20}O_3N_4SClBr$: C, 53.48; H, 3.45; N, 9.60. Found: C, 53.54; H, 3.50; N, 9.63.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(4'''-bromophenyldiazenyl) phenyl] -5-methyl-1,3-thiazolidin-4-one (2g). Yield-Conventional 62% (11.5hr), Microwave-90% (7min), m.p.-234-237°C; IR (cm^{-1}): 3481 (-OH), 684(-Cl), 712 (Ar-Br), 1737 (C=O, thiazolidinone), 1578 (C=N), 1600 (N=N), 620 (C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 9.37 (s, 1H, Ar-OH); 8.11 (s, 1H, C_8-H); 7.92 (s, 1H, C_4-H); 7.69 (d, 2H, $C_{23,27}$-H); 7.60 (d, *J* = 8.89 Hz, 1H, C_5-H); 7.55 (d, 2H, $C_{24,26}$-H); 7.50 (d, *J* = 8.70 Hz, 1H, C_6-H); 7.30 (s, 1H, C_{15}-H); 7.10 (d, *J* = 8.57 Hz, 1H, C_{17}-H); 6.86 (d, *J* = 8.43 Hz, 1H, C_{18}-H); 4.35 (q, *J* = 6.9 Hz, 1H, CH-CH_3); 4.21 (s, 1H, -CH-N); 3.84 (s, 3H, -OCH_3); 1.35 (d, *J* = 7.2 Hz, 3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 176.20 (C=O, thiazolidinone), 160.98 (C-OCH_3); 152.10 (C-Cl); 148.47 (C_b); 125.09 (C_a); 57.54 (-OCH_3); 42.14 (CHS, thiazolidinone); 40.87 (CH-CH_3, thiazolidinone); 18.34 (CH-CH_3, thiazolidinone); 119.09-159.60 (Aromatic). M/S, m/z: 584 (M^+), 588 (M+4). Anal. Calcd for $C_{26}H_{20}O_3N_4SClBr$: C, 53.48; H, 3.45; N, 9.60. Found: C, 53.54; H, 3.47; N, 9.66.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(2'''-chlorophenyldiazenyl)phenyl] -5-methyl-1,3-thiazolidin-4-one (2h). Yield-Conventional 75% (11hr), Microwave-88% (6.5min), m.p.-178-180°C; IR (cm^{-1}): 3477 (-OH), 712 (-Cl), 1723 (C=O, thiazolidinone), 1573 (C=N), 1610 (N=N), 623(C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 9.39 (s, 1H, Ar-OH); 8.15 (s, 1H, C_8-H); 7.91 (s, 1H, C_4-H); 7.82 (d, 1H, C_{27}-H); 7.58 (d, *J* = 8.67 Hz, 1H, C_5-H); 7.55 (d, *J* = 8.64 Hz, 1H, C_6-H); 7.40 (dd, 1H, C_{25}-H); 7.37 (s, 1H, C_{15}-H); 7.15 (d, 1H, C_{26}-H); 7.10 (d, *J* = 8.40 Hz, 1H, C_{17}-H); 7.04 (d, 1H, C_{24}-H); 6.87 (d, *J* = 8.43 Hz,

1H, C_{18}-H); 4.33 (q, *J* = 7.3 Hz, 1H, CH-CH_3); 4.18 (s, 1H, -CH-N); 3.85 (s, 3H, -OCH_3); 1.25 (d, *J* = 7.1 Hz, 3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 177.70 (C=O, thiazolidinone), 160.30 (C-OCH_3); 153.04 (C-Cl); 149.50 (C_b); 124.22 (C_a); 56.41 (-OCH_3); 42.07 (CHS, thiazolidinone); 41.15 (CH-CH_3, thiazolidinone); 18.33 (CH-CH_3, thiazolidinone); 119.02-155.30 (Aromatic).M/S, m/z: 539 (M^+), 543 (M+4). Anal. Calcd for $C_{26}H_{20}O_3N_4SCl_2$: C, 57.81; H, 3.73; N, 10.39. Found: C, 57.87; H, 3.77; N, 10.44.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(3'''-chlorophenyldiazenyl)phenyl] -5-methyl-1,3-thiazolidin-4-one (2i). Yield-Conventional 77% (11.5hr), Microwave-90% (6.5min), m.p.-180-181°C; IR (cm^{-1}): 3475 (-OH), 680 (-Cl), 1740 (C=O, thiazolidinone), 1590 (C=N), 1602 (N=N), 622 (C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 9.37 (s, 1H, Ar-OH); 8.15 (s, 1H, C_8-H); 7.88 (s, 1H, C_4-H); 7.71 (s, 1H, C_{27}-H); 7.66 (d, *J* = 8.89 Hz, 1H, C_5-H); 7.49 (d, *J* = 8.75 Hz, 1H, C_6-H); 7.44 (d, 1H, C_{26}-H); 7.33 (s, 1H, C_{23}-H); 7.29 (s, 1H, C_{15}-H); 7.13 (d, *J* = 8.29 Hz, 1H, C_{17}-H); 6.90 (d, 1H, C_{25}-H); 6.80 (d, *J* = 8.47 Hz, 1H, C_{18}-H); 4.36 (q, *J* = 7.0 Hz, 1H, CH-CH_3); 4.23 (s, 1H, -CH-N); 3.84 (s, 3H, -OCH_3); 1.27 (d, *J* = 7.1 Hz, 3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 178.21 (C=O, thiazolidinone), 163.00 (C-OCH_3); 153.14 (C-Cl); 148.47 (C_b); 125.09 (C_a); 57.54 (-OCH_3); 41.90 (CHS, thiazolidinone); 40.98 (CH-CH_3, thiazolidinone); 19.01 (CH-CH_3, thiazolidinone); 121.0-158.78 (Aromatic). M/S, m/z: 539 (M^+), 543 (M+4). Anal. Calcd for $C_{26}H_{20}O_3N_4SCl_2$: C, 57.81; H, 3.73; N, 10.39. Found: C, 57.85; H, 3.79; N, 10.42.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(4'''-chlorophenyldiazenyl)phenyl] -5-methyl-1,3-thiazolidin-4-one (2j). Yield-Conventional 71% (12hr), Microwave-89% (7min), m.p.-194-195°C; IR (cm^{-1}): 3481 (-OH), 692 (-Cl), 1740 (C=O, thiazolidinone), 1578 (C=N), 1600 (N=N), 623 (C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 9.41 (s, 1H, Ar-OH); 8.11 (s, 1H, C_8-H); 7.89 (s, 1H, C_4-H); 7.70 (d, 2H, $C_{23,27}$-H); 7.60 (d, *J* = 8.75 Hz, 1H, C_5-H); 7.56 (d, *J* = 8.70 Hz, 1H, C_6-H); 7.51 (d, 2H, $C_{24,26}$-H); 7.31 (s, 1H, C_{15}-H); 7.09 (d, *J* = 8.43 Hz, 1H, C_{17}-H); 6.90 (d, *J* = 8.47 Hz, 1H, C_{18}-H); 4.30 (q, *J* = 7.1 Hz, 1H, CH-CH_3); 4.21 (s, 1H, -CH-N); 3.84 (s, 3H, -OCH_3); 1.25 (d, *J* = 7.1 Hz, 3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 177.87 (C=O, thiazolidinone), 161.30 (C-OCH_3); 154.99 (C-Cl); 148.47 (C_b); 122.54 (C_a); 57.09 (-OCH_3); 41.90 (CHS, thiazolidinone); 40.12 (CH-CH_3, thiazolidinone); 18.33 (CH-CH_3, thiazolidinone); 119.0-155.37 (Aromatic). M/S, m/z: 539 (M^+), 543 (M+4). Anal. Calcd for $C_{26}H_{20}O_3N_4SCl_2$: C, 57.81; H, 3.73; N, 10.39. Found: C, 57.87; H, 3.79; N, 10.40.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(2'''-nitrophenyldiazenyl)phenyl]-5-methyl-1,3-thiazolidin-4-one (2k). Yield-Conventional 70% (11hr), Microwave-86% (6.5min), m.p.-167-168°C; IR (cm^{-1}): 3485 (-OH), 680 (-Cl), 1358 (Ar-NO_2), 1730 (C=O, thiazolidinone), 1571(C=N), 1600 (N=N), 625 (C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 10.01 (s, 1H, Ar-OH); 8.12 (s, 1H, C_8-H); 7.87 (s, 1H, C_4-H); 7.82 (d, 1H, C_{27}-H); 7.58 (d, *J* = 8.79 Hz, 1H, C_5-H); 7.49 (d, *J* = 8.79 Hz, 1H, C_6-H); 7.35 (dd, 1H, C_{25}-H); 7.28 (s, 1H, C_{15}-H); 7.05 (d, *J* = 8.39 Hz, 1H, C_{17}-H); 7.00 (d, 1H, C_{26}-H); 6.93 (d, 1H, C_{24}-H); 6.81 (d, *J* = 8.43 Hz,1H, C_{18}-H); 4.37 (q, *J* = 6.9 Hz, 1H, CH-CH_3); 4.20 (s, 1H, -CH-N); 3.79 (s, 3H, -OCH_3); 1.29 (d, *J* = 7.2 Hz, 3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 175.77 (C=O,

thiazolidinone), 162.41 (C-OCH_3); 152.40 (C-Cl); 148.55 (C_b); 125.09 (C_a); 57.09 (-OCH_3); 42.60 (CHS, thiazolidinone); 40.96 (CH-CH_3, thiazolidinone); 18.09 (CH-CH_3, thiazolidinone); 114.09-157.89 (Aromatic). M/S, m/z: 550 (M^+), 552 (M+2). Anal. Calcd for $C_{26}H_{20}O_5N_5SCl$: C, 56.78; H, 3.66; N, 12.73. Found: C, 56.82; H, 3.71; N, 12.77.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(3'''-nitrophenyldiazenyl)phenyl]-5-methyl-1,3-thiazolidin-4-one (2l). Yield-Conventional 71% (11hr), Microwave-84% (6min), m.p.-225-226°C; IR (cm^{-1}): 3475 (-OH), 680(-Cl), 1350 (Ar-NO_2), 1731 (C=O, thiazolidinone), 1582 (C=N), 1598 (N=N), 618 (C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 9.54 (s, 1H, Ar-OH); 8.11 (s, 1H, C_8-H); 7.90 (s, 1H, C_4-H); 7.69 (s, 1H, C_{27}-H); 7.61 (d, *J* = 8.79 Hz, 1H, C_5-H); 7.52 (d, *J* = 8.77 Hz, 1H, C_6-H); 7.44 (s, 1H, C_{23}-H); 7.33 (s, 1H, C_{15}-H); 7.27 (d, 1H, C_{26}-H); 7.09 (d, *J* = 8.43 Hz, 1H, C_{17}-H); 6.96 (d, 1H, C_{25}-H); 6.80 (d, *J* = 8.43 Hz, 1H, C_{18}-H); 4.31 (q, *J* = 7.2 Hz, 1H, CH-CH_3); 4.25 (s, 1H, -CH-N); 3.84 (s, 3H, -OCH_3); 1.27 (d, *J* = 6.9 Hz, 3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 177.7 (C=O, thiazolidinone), 160.30 (C-OCH_3); 153.04 (C-Cl); 146.95 (C_b); 124.22 (C_a); 56.41 (-OCH_3); 42.07 (CHS, thiazolidinone); 41.15 (CH-CH_3, thiazolidinone); 18.30 (CH-CH_3, thiazolidinone); 116.40-154.67 (Aromatic). M/S, m/z: 550 (M^+), 552 (M+2). Anal. Calcd for $C_{26}H_{20}O_5N_5SCl$: C, 56.78; H, 3.66; N, 12.73. Found: C, 56.82; H, 3.73; N, 12.75.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(4'''-nitrophenyldiazenyl)phenyl]-5-methyl-1,3-thiazolidin-4-one (2m). Yield-Conventional 65% (12hr), Microwave-86% (6.5min), m.p.-189-190°C; IR (cm^{-1}): 3475(-OH), 684(-Cl), 1355 (Ar-NO_2), 1744 (C=O, thiazolidinone), 1580 (C=N), 1611(N=N), 629(C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 9.54 (s, 1H, Ar-OH); 8.15 (s, 1H, C_8-H); 7.97 (s, 1H, C_4-H); 7.73 (d, 2H, $C_{23,27}$-H); 7.63 (d, *J* = 8.67 Hz, 1H, C_5-H); 7.56 (d, 2H, $C_{24,26}$-H); 7.51 (d, *J* = 8.77 Hz, 1H, C_6-H); 7.31 (s, 1H, C_{15}-H); 7.09 (d, *J* = 8.43 Hz, 1H, C_{17}-H); 6.84 (d, *J* = 8.28 Hz, 1H, C_{18}-H); 4.32 (q, *J* = 7.1 Hz, 1H, CH-CH_3); 4.21 (s, 1H, -CH-N); 3.88 (s, 3H, -OCH_3); 1.33 (d, *J* = 7.0 Hz, 3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 177.70 (C=O, thiazolidinone), 160.10 (C-OCH_3); 152.40 (C-Cl); 147.87 (C_b); 122.20 (C_a); 57.09 (-OCH_3); 41.6 (CHS, thiazolidinone); 41.07 (CH-CH_3, thiazolidinone); 18.30 (CH-CH_3, thiazolidinone); 111.0-153.87 (Aromatic). M/S, m/z: 550 (M^+), 552 (M+2). Anal. Calcd for $C_{26}H_{20}O_5N_5SCl$: C, 56.78; H, 3.66; N, 12.73. Found: C, 56.84; H, 3.71; N, 12.78.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(2'''-methylphenyldiazenyl) phenyl] -5-methyl-1,3-thiazolidin-4-one (2n). Yield-Conventional 75% (11.5hr), Microwave-88% (7min), m.p.-182-184°C; IR (cm^{-1}): 3485 (-OH), 680 (-Cl), 2930 (Ar-CH_3), 1733 (C=O, thiazolidinone), 1571 (C=N), 1600 (N=N), 645 (C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 9.45 (s, 1H, Ar-OH); 8.12 (s, 1H, C_8-H); 7.85 (s, 1H, C_4-H); 7.80 (d, 1H, C_{27}-H); 7.56 (d, *J* = 8.70 Hz, 1H, C_5-H); 7.48 (d, *J* = 8.69 Hz, 1H, C_6-H); 7.37 (dd, 1H, C_{25}-H); 7.25 (s, 1H, C_{15}-H); 7.05 (d, *J* = 8.49 Hz, 1H, C_{17}-H) 7.01 (d, 1H, C_{26}-H); 6.93 (d, 1H, C_{24}-H); 6.83 (d, *J* = 8.47 Hz, 1H, C_{18}-H); 4.35 (q, *J* = 7.3 Hz, 1H, CH-CH_3); 4.22 (s, 1H, -CH-N); 3.77 (s, 3H, -OCH_3); 2.77 (s, 3H, Ar-CH_3); 1.27 (d, *J* = 7.1 Hz, 3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 178.20 (C=O, thiazolidinone), 160.98 (C-OCH_3); 152.10 (C-Cl); 148.47 (C_b); 125.09 (C_a); 57.54 (-OCH_3);

42.14 (CHS, thiazolidinone); 40.87 (CH-CH_3, thiazolidinone); 22.30 (-CH_3); 18.34 (CH-CH_3, thiazolidinone); 116.09-159.60 (Aromatic). M/S, m/z: 519 (M^+), 521 (M+2). Anal. Calcd for $C_{27}H_{23}O_3N_4SCl$: C, 62.48; H, 4.46; N, 10.79. Found: C, 62.53; H, 4.50; N, 10.82.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(3'''-methylphenyldiazenyl) phenyl] -5-methyl-1,3-thiazolidin-4-one (2o). Yield-Conventional 78% (12hr), Microwave-89% (7min), m.p.-217-218°C; IR (cm^{-1}): 34781 (-OH), 685(-Cl), 2935 (Ar-CH_3), 1747 (C=O, thiazolidinone), 1590 (C=N), 1617 (N=N), 635 (C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 9.19 (s, 1H, Ar-OH); 8.12 (s, 1H, C_8-H); 7.93 (s, 1H, C_4-H); 7.64 (d, *J* = 8.57 Hz, 1H, C_5-H); 7.51 (d, *J* = 8.69 Hz, 1H, C_6-H); 7.48 (s, 1H, C_{27}-H); 7.44 (s, 1H, C_{23}-H); 7.38 (d, 1H, C_{26}-H); 7.31 (s, 1H, C_{15}-H); 7.07 (d, *J* = 8.39 Hz, 1H, C_{17}-H); 6.99 (d, 1H, C_{25}-H); 6.83 (d, *J* = 8.47 Hz, 1H, C_{18}-H); 4.30 (q, *J* = 7.2 Hz, 1H, CH-CH_3); 4.20 (s, 1H, -CH-N); 3.89 (s, 3H, -OCH_3); 2.79 (s, 3H, Ar-CH_3); 1.34 (d, *J* = 7.2 Hz, 3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 177.87 (C=O, thiazolidinone), 161.30 (C-OCH_3); 154.99 (C-Cl); 148.47 (C_b); 122.54 (C_a); 57.09 (-OCH_3); 41.90 (CHS, thiazolidinone); 41.11 (CH-CH_3, thiazolidinone); 22.34 (-CH_3); 18.33 (CH-CH_3, thiazolidinone); 121.0-155.37 (Aromatic). M/S, m/z: 519 (M^+), 521 (M+2). Anal. Calcd for $C_{27}H_{23}O_3N_4SCl$: C, 62.48; H, 4.46; N, 10.79. Found: C, 62.51; H, 4.53; N, 10.82.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(4'''-methylphenyldiazenyl) phenyl] -5-methyl-1,3-thiazolidin-4-one (2p). Yield-Conventional 68% (11hr), Microwave-88% (6min), m.p.-247-249°C; IR (cm^{-1}): 3439 (-OH), 708 (-Cl), 2929 (Ar-CH_3), 1720 (C=O, thiazolidinone), 1566 (C=N), 1612 (N=N), 623(C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 9.37 (s, 1H, Ar-OH); 8.11 (s, 1H, C_8-H); 7.95 (s, 1H, C_4-H); 7.60 (d, *J* = 8.79 Hz, 1H, C_5-H); 7.54 (d, *J* = 8.79 Hz, 1H, C_6-H); 7.26 (s, 1H, C_{15}-H); 6.99 (d, *J* = 8.43 Hz, 1H, C_{17}-H); 6.90 (d, 2H, $C_{23,27}$-H); 6.77 (d, *J* = 8.43 Hz, 1H, C_{18}-H); 6.51 (d, 2H, $C_{24,26}$-H); 4.28 (q, *J* = 6.9 Hz, 1H, CH-CH_3); 4.18 (s, 1H, -CH-N); 3.85 (s, 3H, -OCH_3); 2.77 (s, 3H, Ar-CH_3); 1.29 (d, *J* = 6.9 Hz, 3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 177.20 (C=O, thiazolidinone), 160.98 (C-OCH_3); 152.10 (C-Cl); 148.47 (C_b); 125.09 (C_a); 57.54 (-OCH_3); 42.14 (CHS, thiazolidinone); 41.10 (CH-CH_3, thiazolidinone); 22.34 (-CH_3); 18.34 (CH-CH_3, thiazolidinone); 120.09-153.66 (Aromatic). M/S, m/z: 519 (M^+), 521 (M+2). Anal. Calcd for $C_{27}H_{23}O_3N_4SCl$: C, 62.48; H, 4.46; N, 10.79. Found: C, 62.53; H, 4.53; N, 10.85.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(2'''-fluorophenyldiazenyl)phenyl] -5-methyl-1,3-thiazolidin-4-one (2q). Yield-Conventional 69% (11hr), Microwave-90% (7min), m.p.-220-222°C; IR (cm^{-1}): 3477 (-OH), 678 (-Cl), 712 (Ar-F), 1739(C=O, thiazolidinone), 1568 (C=N), 1604 (N=N), 618 (C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 9.35 (s, 1H, Ar-OH); 8.10 (s, 1H, C_8-H); 7.88 (s, 1H, C_4-H); 7.80 (d, 1H, C_{27}-H); 7.63 (d, *J* = 8.89 Hz, 1H, C_5-H); 7.55 (d, *J* = 8.79 Hz, 1H, C_6-H); 7.37 (dd, 1H, C_{25}-H); 7.28 (s, 1H, C_{15}-H); 7.11 (d, *J* = 8.40 Hz, 1H, C_{17}-H); 7.06 (d, 1H, C_{26}-H); 6.97 (d, 1H, C_{24}-H); 6.89 (d, *J* = 8.49 Hz, 1H, C_{18}-H); 4.37 (q, *J* = 6.9 Hz, 1H, CH-CH_3); 4.26 (s, 1H, -CH-N); 3.81 (s, 3H, -OCH_3); 1.34 (d, *J* = 6.8 Hz, 3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 175.77 (C=O, thiazolidinone), 162.41 (C-OCH_3); 155.47 (C-Cl); 146.55 (C_b); 125.09 (C_a); 57.09 (-OCH_3); 42.60 (CHS, thiazolidinone); 40.96 (CH-CH_3, thiazolidinone); 18.39 (CH-CH_3, thiazolidinone);

115.09-157.89 (Aromatic). M/S, m/z: 523 (M^+), 525 (M+2). Anal. Calcd for $C_{26}H_{20}O_3N_4SClF$: C, 59.71; H, 3.85; N, 10.71. Found: C, 59.76; H, 3.91; N, 10.76.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(3'''-fluorophenyldiazenyl)phenyl] -5-methyl-1,3-thiazolidin-4-one (2r). Yield-Conventional 64% (12hr), Microwave-87% (6.5min), m.p.-236-237°C; IR (cm^{-1}): 3475 (-OH), 684 (-Cl), 716 (Ar-F), 1731 (C=O, thiazolidinone), 1582 (C=N), 1610 (N=N), 622 (C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 9.45 (s, 1H, Ar-OH); 8.11 (s, 1H, C_8-H); 7.97 (s, 1H, C_4-H); 7.63 (d, *J* = 8.79 Hz, 1H, C_5-H); 7.51 (d, *J* = 8.79 Hz, 1H, C_6-H); 7.49 (s, 1H, C_{27}-H); 7.45 (s, 1H, C_{23}-H); 7.38 (d, 1H, C_{26}-H); 7.31 (s, 1H, C_{15}-H); 7.07 (d, *J* = 8.43 Hz, 1H, C_{17}-H); 6.99 (d, 1H, C_{25}-H); 6.83 (d, *J* = 8.49 Hz, 1H, C_{18}-H); 4.30 (q, *J* = 7.1 Hz,1H, CH-CH_3); 4.21 (s, 1H, -CH-N); 3.86 (s, 3H, -OCH_3); 1.33 (d, *J* = 6.9 Hz,3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 178.21 (C=O, thiazolidinone), 160.98 (C-OCH_3); 153.14 (C-Cl); 148.47 (C_b); 125.09 (C_a); 57.54 (-OCH_3); 41.90 (CHS, thiazolidinone); 40.87 (CH-CH_3, thiazolidinone); 19.01 (CH-CH_3, thiazolidinone); 121.0-158.78 (Aromatic). M/S, m/z: 523 (M^+), 525 (M+2). Anal. Calcd for $C_{26}H_{20}O_3N_4SClF$: C, 59.71; H, 3.85; N, 10.71. Found: C, 59.76; H, 3.89; N, 10.74.

2-[(2'-Chloro-7'-methoxyquinoline-3'-yl)]-3-[3''-hydroxy-6''-(4'''-fluorophenyldiazenyl)phenyl] -5-methyl-1,3-thiazolidin-4-one (2s). Yield-Conventional 71% (12hr), Microwave-88% (7min), m.p.-235-236°C; IR (cm^{-1}): 3478 (-OH), 691(-Cl), 712 (Ar-F), 1735 (C=O, thiazolidinone), 1584 (C=N), 1602 (N=N), 620 (C-S-C). ^{1}H-NMR (400 MHz, $CDCl_3$) δ: 9.40 (s, 1H, Ar-OH); 8.12 (s, 1H, C_8-H); 7.92 (s, 1H, C_4-H); 7.78 (d, 2H, $C_{23,27}$-H); 7.60 (d, *J* = 8.79 Hz, 1H, C_5-H); 7.51 (d, *J* = 8.77 Hz, 1H, C_6-H); 7.40 (d, 2H, $C_{24,26}$-H); 7.30 (s, 1H, C_{15}-H); 7.07 (d, *J* = 8.43 Hz, 1H, C_{17}-H); 6.88 (d, *J* = 8.57 Hz, 1H, C_{18}-H); 4.31 (q, *J* = 6.9 Hz, 1H, CH-CH_3); 4.21 (s, 1H, -CH-N); 3.84 (s, 3H, -OCH_3); 1.25 (d, *J* = 6.9 Hz, 3H, CH-CH_3). ^{13}C-NMR (50 MHz; $CDCl_3$) δ: 177.87 (C=O, thiazolidinone), 161.20 (C-OCH_3); 152.36 (C-Cl); 148.58 (C_b); 127.00 (C_a); 57.09 (-OCH_3); 42.66 (CHS, thiazolidinone); 41.00 (CH-CH_3, thiazolidinone); 18.34 (CH-CH_3, thiazolidinone); 111.0-156.37 (Aromatic). M/S, m/z: 523 (M^+), 525 (M+2). Anal. Calcd for $C_{26}H_{20}O_3N_4SClF$: C, 59.71; H, 3.85; N, 10.71. Found: C, 59.78; H, 3.88; N, 10.73.

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