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STUDIES OF 4-FURANONE AND 4-OXAZOLONE SUBSTITUTED COUMARINS: SYNTHESIS, PHYSIOLOGICAL AND BIOLOGICAL ACTIVITY

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Abstract :
3-(coumarin-4-yl)-5-(substituted benzoyl)-2-(3H)-furanones have been prepared from 3-(substituted benzoyl propionic acid and coumarin-4-aldehyde and characterized on the basis of IR, ^{1}H NMR and mass spectrometric data. Some of the compounds have been tested for antibacterial activity.

Introduction:

The chemistry of butenolides has attracted more attention in the last few decades due to their novel biological actions was used as an important anthelmintic and ascaricidal gents.[1,2] The butenolide ring present in cardenolides shows a strong oral cardiotonic activity.[3] The 3,3-diethylbutylrolactone has been reported to have anticonvulsant activity.[4] While the butenolides have exhibited antibiotic activity.[5] anti-inflammatory , analgesic , antitumor, antiviral and anticancer properties also.[6,7] and potential pharmaceutical interest.[8,9]

In the present investigations, we report the synthesis and reaction of 3-(coumarin-4-yl)-5-(substituted benzoyl)-2-(3H)-furanones following the literature procedure.[10] with appropriate modification , and a study of biological acitivity of the resulting products. These compounds
were synthesized according to **Scheme I.** Similarly, 3-(coumarin-4-yl)-5-(substituted benzoyl)-2-(3H)-Oxazolones,[11,12] In our earlier work, we have assigned E-configuration based on NOE
experiments. [13] These compounds were synthesized according to **Scheme II**.

Results and Discussion:

In our earlier work, we have assigned E-configuration based on NOE experiments. [13] Similarly, 3-(coumarin-4-yl)-5-(substituted benzoyl)-2-(3H)-Oxazolones, were synthesized from (un)substituted benzoyl glycine by reacting with coumarin-4-aldehyde in the presence of Sodium acetate in acetic anhydride (Scheme II) . The structures assigned to the compounds were supported by the results of I.R, ^{1}H NMR and Mass. Physiological studies: The synthesized molecules of Furanones(20-32) showed λmax between 330nm to 420nm, while the synthesized molecules of Oxazolones(41-59) showed λmax between 330nm to 420nm.

EXPERIMENTAL (General procedure):4-[(7-propanoyloxy–2H-1-benzopyran-2-one-4-yl)methylene–2-phenyl-(4H)furanone**20**: 7-propanoyloxycoumarin-4-carboxaldehyde,**9** (1.23g, 0.005 moles), fused sodium acetate (2.0gm) and benzoyl propionic acid, **17** (0.98g, 0.0055moles) were intimately mixed by grinding in mortal . The mixture was mixed with acetic anhydride(3ml) , heated on a boiling water bath for 20min.,with shaking and stirring, diluted from ethanol solvent afforded 20; yield 0.95g(49%); mp 260-262°C. IR(KBr):3152, 839,1767, , 1620, 1506, 1251, 1221, 1135, 1006, 757 cm^{-1}; ^{1}H-NMR($CDCl_3$): δ =1.30(3H, t, *J* = 7.61Hz), 2.64-2.71(m, 2H), 6.62(s, 1H), 6.73(s,1H), 7.09(1H, d, *J* = 2.3Hz), 7.13(1H, d, *J* = 2.3Hz), 7.19(1H, d, *J* = 2.3Hz), 7.28(2H, d, *J* = 8.2 Hz,), 7.42(s, 1H), 7.67(2H, d, *J* = 8.2Hz), 7.73(1H, d, *J* = 8.6Hz); MS: mz (M^+,389).

4-[(7-propanoyloxy-2H-1-benzopyran-2-one-4-yl)methylene-2(4-methoxyphenyl)-5(4H)furanone **21**; yield 1.19g (57%); mp 256-258°Cr. IR(KBr): 3163, 3035, 2868,1783, 1561, 1349, 1281, 755 cm^{-1}; ^{1}H-NMR($CDCl_3$): δ= 1.29(3H, t, *J* = 7.52Hz), 2.61-2.69 (m, 2H), 3.89(s, 3H), 6.68(s, 1H), 7.00 (1H, d, *J* = 9.2Hz), 7.12(1H, d, *J* = 2.2Hz),7.14(1H, d, *J* = 2.2Hz), 7.23(2H, d, *J* = 2.2Hz), 7.39(s, 1H), 7.73-7.77(s, 3H); MS: mz (M^+, 419). 4-[(7-butanoyloxy-2H-1-benzopyran-2-one-4-yl)methylene-2-phenyl-5(4H)furanone

22; yield 0.95g (61%); mp 260-262°C. IR(KBr): m.p.=270-272°Cchar).IR(KBr):3155, 927, 2878, 1750, 619, 1574, 1506, 1214, 1133, 990,856,753 cm^{-1}; ^{1}H-NMR ($CDCl_3$): δ= 0.98(3H, t, *J* = 7.4Hz), 1.49-1.75 (m, 2H), 2.52 (2H, t, *J* = 6.9Hz), 6.54(s, 1H), 6.66(s, 1H), 7.01-7.23(m, 5H), 7.34(s, 1H), 7.59 (2H, d, *J* = 8.6Hz), 7.63(s, 1H).

4-[(7-butanoyloxy-2H-1- benzopyran -2-one-4-yl)methylene-2(4-methyl)phenyl-5(4H) furanone **23**;The compoun was obtained as orange yellow

needle from ethanol,1.19g (yield=57%, m.p.=265-268°C char). IR(KBr): 3163, 3035, 1783, 1699, 1561, 1349,1281, 988, 750cm^{-1}; ^{1}H-NMR($CDCl_3$): δ=1.07(3H, t, *J* = 7.4Hz), 1.76-1.87(m, 2H), 2.43

(s, 3H), 2.60(2H, t, *J* = 7.4Hz), 6.61(s, 1H), 6.68(s, 1H), 6.73(s, 1H), 7.08(1H, d, *J* = 2.3Hz), 7.12 (1H, d, *J*= 2.0 Hz), 7.27 (1H, t, *J* = 6.2Hz), 7.42(s, 1H), 7.65-7.75(m, 3H). 4-[(7-butanoyloxy-2H-1-benzopyran-2-one-4-yl)methylene-2-(4-methoxyphenyl)-5(4H) furanone **24** ; yield 1.27g (59%); mp 260-262°C. IR(KBr): 3159, 2997, 2841, 1778, 1705, 1607, 1504,1233, 989, 828cm^{-1}; ^{1}H-NMR($CDCl_3$) : δ=1.07(3H, t, *J* = 7.5Hz),1.78-1.84(m, 2H), 2.60(2H, t, *J* =7.8Hz), 3.90(s, 3H), 6.67(2H, d, *J*=2.3Hz), 7.12(2H, d, *J* = 2.3Hz),7.13(2H, t,

J=2.3 Hz), 7.20(1H, d, *J* = 2.3Hz),7.39(s, 1H),7.74-7.77(m,2H). 4-[(7-benzoyloxy-2H-1-benzopyran-2-one-4-yl)methylene-2(4-methyl)phenyl-5(4H) .

furanone **25**, yield 1.52g (61%); mp284-286°C. IR(KBr):3161, 3030, 2917, 1785, 1474,1413, 1347, 1260, 1134, 1025, 990 &752cm^{-1}; ^{1}H-NMR($CDCl_3$): δ=2.57(s, 3H), 6.65 (s,1H), 6,77(s, 1H), 7.20-7.47(m, 4H), 7.49(s, 1H), 7.55(2H, t, *J* = 7.5Hz), 7.69(2H, t, *J* = 7.3Hz), 7.81 (2H, d, *J* = 8.8Hz), 8.22(2H, d, *J* = 7.0Hz). 4-[(7-benzoyloxy-2H-1-benzopyran-2-one-4-yl)methylene–2(4-methoxy)phenyl-5(4H)

furanone **26**; yield 1.23g (53%); mp284-286°C. IR(KBr): 3161, 3030, 2917, 1785, 1474, 1413, 1347, 1260, 1134, 1025, 990 & 752 cm^{-1}; ^{1}H-NMR($CDCl_3$) δ: 3.90(s, 3H), 6.70 (s, 1H), 6.91-7.20 (m, 3H), 7.29(s, 1H),7.32 (1H, t, *J* = 6.6Hz), 7.35(1H, t, *J* = 7.3Hz), 7.53-7.81 (m, 6H), 8.22 (2H, d, *J* = 7.3Hz); MS: mz(M^+ ,467).

4-[(7-(2-chlorobenzoyloxy -2H-1- benzopyran -2-one -4-yl)methylene-2(4-methyl) phenyl-5(4H)furanone **27**, yield 1.52g (59%); mp258-260°C. IR(KBr): 3161, 3030, 2917, 1785, 1474,1413, 1347, 1260, 1134, 1025, 990,752cm^{-1}; ^{1}H-NMR(D_2SO_4) δ 2.59(s, 3H), 6.93(s, 1H), 7.24(s, 2H), 7.44-7.71(m, 6H), 7.87(1H, d, *J* = 8.8Hz), 8.07(2H, d, *J* = *7.0*Hz), 8.24(s, 1H), 8.42(1H, d, *J* = 7.0Hz). 4-[(7-Benzyl-2H-1-benzopyran-2-one-4-yl)methylene-2(4-methyl)phenyl-5-(4H)

Furanone **28;** yield 1.42g (53%); mp245-247°C. IR(KBr):3160, 2997, 2841, 1778, 1705, 1607, 1504, 1351, 1251, 1142, 829cm^{-1}; ^{1}H-NMR($CDCl_3$): δ2.44(s, 3H), 5.17(s, 2H), 6.62(s, 1H),6.96(2H, d, *J* = 2.45Hz),7.00(1H, d, *J* = 2.5Hz), 7.30(1H, d, *J* = 8.3Hz), 7.37(s, 1H), 7.38-7.64(m, 6H),7.67(3H, d, *J* = 6.4Hz).

4 -[(7- Benzyl -2H-1- benzopyran -2-one -4-yl) methylene -2(4-methoxy)phenyl-5-(4H) furanone **29**; yield 1.40g (62%); mp284-286°C. IR(KBr):3160, 2841, 1778, 1705, 1607, 1504, 1351, 1251, 989, 829 cm^{-1}; ^{1}H-NMR($CDCl_3$): δ 3.89(s, 3H), 5.16(s, 2H), 6.50(s, 1H), 6.68(s, 1H), 6.95-7.12(m, 4H),7.26-7.44(m, 6H),7.64(s, 1H),7.67(s, 1H),7.75(s, 1H). 4-[(7-(2'-Chlorobenzyl-2H-1-benzopyran-2-one-4-yl)methylene-2-phenyl)-5-(4H)

furanone **30**; yield 1.20g (53%); mp215-218°C. IR(KBr): 3146, 1784, 1716, 1610, 1538, 1507, 1352, 1281, 1185, 1160, 1035, 993 and 743cm^{-1}; ^{1}H-NMR($CDCl_3$): δ= 5.27(s, 2H), 6.51(s, 1H), 6.79(s, 1H), 6.91-7.03(m, 3H), 7.29-7.34(m, 3H), 7.43-7.54(m, 5H), 7.64-7.77(m, 1H), 7.78 (1H, d, *J* = 3.6Hz), 7.82(1H, d, *J* = 9.9Hz).

4-[(7-(4-NitroBenzyl)–2H-1-benzopyran-2-one -4 -yl)methylene –2(4-methyl)phenyl-5-(4H)furanone **31**; yield 1.49g (62%); mp 290-293°C. IR(KBr):3032, 2856, 1778, 1701, 1611,1518, 1346, 1281, 1185, 1148, 987 & 827; ^{1}H-NMR ($CDCl_3$) :δ=2.66(s, 3H), 5.36(s, 2H), 6.47(s, 1H), 6.78(s, 1H), 6.91-6.96(3H, t, *J* = 3.6Hz), 7.60(1H, d, *J* = 2.6Hz), 7.62(3H, d, *J* = 3.6Hz,), 7.75(3H, t, *J*,= 3.6 Hz), 8.25(2H, t, *J*= 3.6Hz).

4-[(7-(4-Cyano Benzyl –2H-1-benzopyran-2-one -4-yl)methylene -2(4-methyl)phenyl- 5 -(4H)furanone **32;** yield 1.25g (58%); mp284-286°C. (yield=58%, m.p.=250-255°Cchar). IR(KBr): 3436, 3072, 2854, 1728, 1612, 1509, 1352,1214, 1183, 1019 and 966 cm^{-1}; ^{1}H-NMR ($CDCl_3$): δ= 2.43(s, 3H), 5.22 (s, 2H), 6.52(s,1H), 6.74(s, 1H), 6.92(3H, d, *J* = 2.6Hz), 7.00(1H, d, *J* = 2.6Hz), 7.28(s, 1H), 7.43(s,1H),7.57(2H, d, *J* = 8.4Hz), 7.66-7.57(m, 5H).

By successfully study of furanone,we prepared analogues Oxazolones which tremendous application in antitumour and anticancer activity. 4-(7-propanoyloxy-2H-bezopyran-2-one-4-yl)methylene)-2-phenyl-5(4H) oxazolone **41**: 7-propanoyloxy benzopyran-2-one-4-carboxaldehyde (1.23g,0.005moles), fused sodium acetate (2.0gm) and benzoyl propionic acid, **17** (0.98g, 0.0055moles) benzoyl Glycine **38** (0.98g

,0.0055moles) mixed with Ac_2O (3ml), heated on a boiling water bath for 20 min. Cooled and filtered, dried, yield1.03 g (53%); mp 235-237°C. IR(KBr): 3135, 3064, 2941, 1766, 1619, 1558, 1452, 1355, 1297, 1137, 978 ,769 cm^{-1}; ^{1}H-NMR($CDCl_3$): δ=1.30 (3H, t, *J* = 7.50Hz), 2.10-2.69(m, 2H), 2.43(s, 3H), 2.60(2H, t, *J* = 7.4Hz), 7.17(1H, d, *J* = 2.2Hz), 7.21(1H, d, *J* = 2.2 Hz), 7.58 (2H, t, *J* = 7.2 Hz), 7.69-7.84(m, 3H), 8.23(1H, d, *J* =7.0 Hz), 8.84(2H, d, *J* = 6.7Hz). MS: mz (M^+, 389).

4-((7-propanoyloxy-2-one-4-yl)methylene)-2-(2-chlorophenyl)5(4H) oxazolone **42**: The compound was obtained as yellow needle from ethylacetate,1.08g(yield=51%,

m.p.=210-220°C). IR(KBr):3135, 2943, 1801, 1760, 1617, 1559, 1474, 1350, 1262, 1132, 977, 866 &733 cm^{-1}; ^{1}H-NMR($CDCl_3$):δ=1.30(3H, t, *J* = 7.6Hz), 2.60-2.71(m, 2H), 7.58

(2H, d, *J* = 7.6Hz), 7.21(1H, d, *J* = 2.2Hz), 7.58(2H, t, *J* = 2.73Hz), 7.75(s, 1H), 7.82 (1H, d, *J* = 8.6 Hz), 8.16 (1H, d, *J* = 7.0Hz). MS: mz (M^+, 423).

4-(7-Butonoyloxy-2H-bezopyran-2-one-4-yl)methylene)-2-phenyl-5(4H)oxazolone **43;** yield 1.02g (53%); IR(KBr): 3097, 2944, 1780,1760, 1617, 1558, 1328, 1262, 1137, 902 & 697 cm^{-1}; ^{1}H-NMR ($CDCl_3$): δ=1.07(3H , t , *J* = 7.4Hz), 1.56-1.88 (m, 2H),2.61 (2H, t, *J* = 7.22Hz), 7.11-7.20(m, 2H), 7.41(s, 1H),7.57 (2H, t, *J* = 7.0Hz), 7.68 (1H, d, *J* =

7.0Hz), 7.80(2H, d, *J* = 8.6 Hz), 8.22(2H, d, *J* =7.02Hz).

4-(7- Butonoyloxy -2H -bezopyran –2- one-4 -yl) methylene)-2-(2-chlorophenyl-5(4H) oxazolones **44**;yield 1.18g (53%); 190-200°C. IR(KBr): 3083 , 2935, 1803, 1761, 1608, 1559, 1473,1264, 1179,974 ,740 cm^{-1}; ^{1}H-NMR ($CDCl_3$): δ= 1.30(3H, t, *J* = 4.5Hz), 1.56-1.88 (m, 2H), 2.60(2H, d, *J* = 7.6Hz), 7.15(2H, d, *J* = 7.8Hz), 7.48(s, 2H), 7.84(2H, d, *J* = 5.5Hz), 7.79(2H, t, *J* = 7.6Hz), 8.16(1H, d, *J* = 6.63Hz).
4-((7-benzoyl-2H-bezopyran-2-one-4-yl) methylene)-2-phenyl-5(4H) oxazolone. **45**;

(52%); 1.13g(yield = 52%, m.p.= 240-243 °C char). IR(KBr): 3078,1870, 1449, 1326, 1248, 1133, 1052, 975, 864 & 769cm^{-1}. ^{1}H-NMR($CDCl_3$):δ=7.36(s,1H), 7.95-8.16(m,7H), 8.21-8.48(m,3H), 8.43-8.48(m, 2H), 8.74(2H, d, *J* = 7.68Hz).

4-((2-chlorobenzoyl)-2H-bezopyran-2-one-4-yl)methylene)-2-(2-chlorophenyl-5(4H) oxazolone**46**; yield 1.01g (39%); 190-200°C. IR(KBr): 3078, 1800, 1736,1558, 1449, 326, 1248, 1132,1051, 978, 864 & 699 cm^{-1}; ^{1}H($CDCl_3$):δ=7.00(s, 1H), 7.39(s, 2H), 7.427.59(m, 4H),7.70(1H, t, *J* = 7.7Hz,), 7.80(2H, t, *J* = 7.7Hz), 7.99-8.13(m, 3H). 4-[7-(2-(Chlorobenzyl)-2H-bezopyran-2-one-4-yl)methylene)]-2-phenyl-5(4H) oxazolone **47**; yield 1.12g (49%); mp190-200°C. IR(KBr):3077, 1800, 1710, 1609, 1554, 1450,1374, 1350, 1280, 1175, 1064, 1064, 1008, 884,697 cm^{-1}; ^{1}H-NMR ($CDCl_3$) : δ= 5.27(s, 2H), 6.95-7.03(m, 2H), 7.23-7.30 (m, 6H), 7.32 (2H, d, *J* = 3.9Hz), 7.50 (s, 1H), 7.57(s, 1H), 7.61(1H, d, *J* = 3.5Hz), 7.74(1H, d, *J* = 8.6Hz).

4-[7-(2-Chlorobenzyl)-2H- bezopyran -2-one-4-yl)methylene)]2-(2-chlorophenyl-5-(4H) oxazolone **48**; yield 1.23g (50%); mp256-258°C. IR(KBr):3080, 1802, 1719, 1617, 1536, 1471, 1430, 1396, 1346, 1209, 1144, 1117, 1033, 1004, 961 &736 cm^{-1}; ^{1}H-NMR ($CDCl_3$): δ= 5.27 (s, 2H) , 6.95-7.03(m, 2H),7.23-7.30(m, 6H), 7.32(2H, d, *J* = 3.9Hz), 7.50 (s, 1H), 7.57(s, 1H), 7.61 (1H, d, *J* = 3.5 Hz), 7.74(1H, d, *J* = 8.6Hz).
4-[7-(4-(nitrobenzy)l-2H-bezopyran-2-one-4-yl)methylene)]-2-(2-chlorophenyl)-5(4H) oxazolone **49**; yield 0.98g (38%); 245-248°C. IR(KBr):2923, 2226, 1801, 1714, 1600, 1554, 1452,1327, 1282, 1145, 1067, 981, 821, 699 & 549 cm^{-1}; ^{1}HNMR($CDCl_3$): δ= 5.22(s, 2H), 6.92(1H, d, *J* = 2.34Hz), 6.98 (1H, d, *J* = 2.7Hz), 7.02(1H, d, *J* = 2.7Hz),7.44-7.63(m, 6H), 7.69-7.77(m, 3H), 8.16(1H, d, *J* = 7.0Hz). 4-[7-(4-cyanobenzyl-2H-bezopyran-2-one-4-yl)methylene)]-2-phenyl-5(4H)oxazolone **50**; yield 1.14g (51%); 250-255°C. IR(KBr):2923, 2226, 1801, 1714, 1512, 1452, 1353, 1327,1282, 1145, 1067, 821549cm^{-1}; ^{1}H-NMR($CDCl_3$):5.22(s, 2H), 6.92(s, 1H),6.99(1H, d, *J* = 9.0Hz), 7.24(s, 2H), 7.40 (s, 1H), 7.55-7.77(m, 8H), 8.22(2H, d, *J* = 7.8Hz). 4-[6-methyl-2H-1-bezopyran-2-one-4-yl) methylene)]-2-phenyl-5(4H) oxazolone **51**; yield 0.75g (51%); 253-255°C.IR(KBr):3066, 1801, 1716, 1654 , 620, 1546, 1452, 1346, 1298, 1178, 1066, 759cm^{-1};^{1}H-NMR($CDCl_3$):δ= 2.48(s, 3H),7.30(1H, d, *J* = 8.6Hz), 7.40(1H ,d, *J* = 8.6Hz), 7.48(s, 1H), 7.54-7.62(m, 3H), 7.70(1H, t, *J* = 7.5 Hz), 7.76(s, 1H), 8.23(2H, d,*J*=7.4 Hz).

4-[6-methyl-2H-1-bezopyran-2-one-4-yl)methylene)]-2-(2-Chloro)phenyl-5(4H) oxazolone **52**; yield 0.73g (51%); 268-270°C.IR(KBr):3066, 1801, 1716, 1654, 1620,

1546, 1452, 1346, 1298, 1178, 1066, 883 &759cm^{-1}. ^{1}H-NMR($CDCl_3$):δ=2.48(s,3H),7.30 (1H, d, *J* = 8.2Hz), 7.40(1H, d, *J* = 8.2Hz), 7.47(1H, d, *J* = 8.0Hz), 7.54-7.62(m, 4H), 7.76(s, 1H), 8.18(1H, d, *J* = 8.2Hz).

4-[6-methyl-2H-1-bezopyran-2-one-4-yl)methylene)]2-(2-methyl)phenyl-5(4H) oxazolone **53**;

yield 0.80g (49%); 231-232^{o}C. IR(KBr):3066,2922,1803,1712, 1652,1537, NMR($CDCl_3$):δ=2.45(s, 3H),2.82(s, 3H), 7.29(1H, d, *J* = 8.3Hz), 7.35-7.42 (m,3H), 7.48(s, 1H), 7.54(1H, t, *J* = 7.3 Hz), 7.61(s, 1H), 7.70(s,1H), 8.15(1H, d, *J* = 8.3Hz).

4-[7-methyl-2H-1-bezopyran-2-one-4-yl) methylene)]-2-phenyl-5(4H) oxazolone **54**: yield 0.73g (51%); 268-270^{o}C.

The compound was obtained as orange yellow needles from ethanol,0.56g (yield=34%, m.p.=281-283^{o}C). IR(KBr):3064, 1805, 1714, 1649, 1560, 1537, 1450, 1348, 1174, 952 and 887cm^{-1}. ^{1}H-NMR($CDCl_3$):δ= 2.48(s, 3H), 7.19(1H, d, *J* = 7.1Hz), 7.21(s, 1H) 7.45(s, 1H), 7.57(2H, t, *J* = 7.0 Hz), 7.68-7.77(m, 3H), 8.23(2H, d, *J* = 7.4 Hz).

4-[7-methyl-2H-1-bezopyran-2-one-4-yl)methylene)]-2-(2-Chloro)phenyl-5(4H) oxazolone **55**: yield 0.64g (35%); 275-277^{o}C. IR(KBr): 3085, 1805, 1712, , 1618, 1546, 1471, 1344, 1274, 1182, 1043,777 cm^{-1}; ^{1}H-NMR($CDCl_3$): δ2.48(s, 3H),7.18(d, *J* = 7.8Hz, 1H), 7.21(s, 1H), 7.45(1H, t, *J* = 7.1Hz), 7.51-7.63(m, 3H), 7.70(m, 2H), 8.20 (1H, d, *J* = 8.3Hz).

4-[7-acetoxy-2H-1-bezopyran-2-one-4-yl)methylene)]-2-(2-Chloro)phenyl-5(4H) oxazolone **56**: yield 0.86g (42%); 226-240^{o}C. IR(KBr):3097, 1797, 1701, 1620, 1554, 1537,1350, 1269, 1186, 894 &727 cm^{-1}; ^{1}H-NMR ($CDCl_3$): δ=2.32(s, 3H),7.22(1H, d, *J* = 8.6 Hz), 7.34(s, 1H), 7.56(s, 1H), 7.61(1H, t, *J* = 8.2 Hz), 7.67(s, 1H), 7.70-7.787(m, 2H),8.13(1H, d, *J* = 8.6 Hz), 8.22(1H, d, *J* = 8.6 Hz).

4-[7-acetoxy-2H-1-bezopyran-2-one-4-yl)methylene)]-2-(2-methyl)phenyl-5(4H) oxazolone **57**: yield 0.73g (51%); 268-270^{o}C. 1.07g (yield=55%,m.p.=245-247^{o}C).IR(KBr): 3097, 1805, 1760, 1718, 1604, 1556, 1535, 1348, 1265, 1178, 1027, 1178, 1020, 896 & 736cm^{-1}; ^{1}H-NMR(DMSO): δ=2.30(s, 3H), 2.66(s, 3H), 7.22(d,*J*=8.2Hz,1H),7.34(s, 1H), 7.47-7.51(m, 3H), 7.59(s, 1H), 7.63(1H, t, *J* = 7.7Hz), 8.03(1H, d, *J* = 8.2Hz), 8.21(1H, d, *J* = 8.2 Hz).

0.80g(yield=49%, m.p.=231-232^{o}C). 1353,1261, 1182, 1089,871cm^{-1}; ^{1}H-

4-[2H-1-napth[1,2-b]pyran-2-one-4-yl)methylene)]-2-(2-methyl)phenyl-5(4H) oxazolone

58 yield 0.28g (51%); mp263-265^{o}C. IR(KBr):3062, 17971, 1712, 1600, 1552, 1533, 1357, 1271, 1184, 1087, 883 and727cm^{-1}; ^{1}H-NMR($CDCl_3$): δ=2.8(s, 3H), 7.44(2H, d, *J* = *8.8*Hz), 7.58(1H t, *J* = *7.9*Hz), 7.63(s, 1H), 6.68-7.72(m, 2H), 7.84 (1H, d, *J* = 8.8Hz), 7.76(s, 1H),7.92-7.98(m, 2H), 8.14 (1H, d, *J* = 8.8Hz), 8.56(1H, t , *J* = 8.2Hz).

4-[2H-1-napth[2,3-b]pyran-2-one-4-yl)methylene)]-2-(2-methyl)phenyl-5(4H) oxazolone **59**;yield 0.70g (38%); 268-270^{o}C. IR(KBr):3066, 1797, 17311552, 1514, 1131, 1271, 1176, 1271, 1033, 877,723cm^{-1}; ^{1}H-NMR($CDCl_3$):δ=2.78(s, 3H), 7.34-7.42(m, 2H), 7.50-7.54(m, 2H),7.58(2H, t, *J* = 7.8Hz),7.70(s, 1H),7.92(1H, d, *J* = 8.3Hz), 7.97(1H, d, *J* = 8.3Hz), 8.04(1H, d, *J* = 8.3Hz), 8.14(1H, t, *J* = 8.3Hz), 8.31(1H, t, *J* = 8.3Hz).

Antibacterial Screening[14]:compounds (**28, 29, 31, 45, 46, 47, 52, 54** and **58**) have been screened against gram negative *S.aureus* and *E.coli.* using tube dilution technique. **Conclusion:**Compounds (**28, 29, 31, 45, 46, 47, 52, 54** and **58**) were evaluated for their anti microbial activity by Using concentration level of 5µg/ml to 200 µg/ml. The test organism employed were *S.aureus* and *E.coli.*

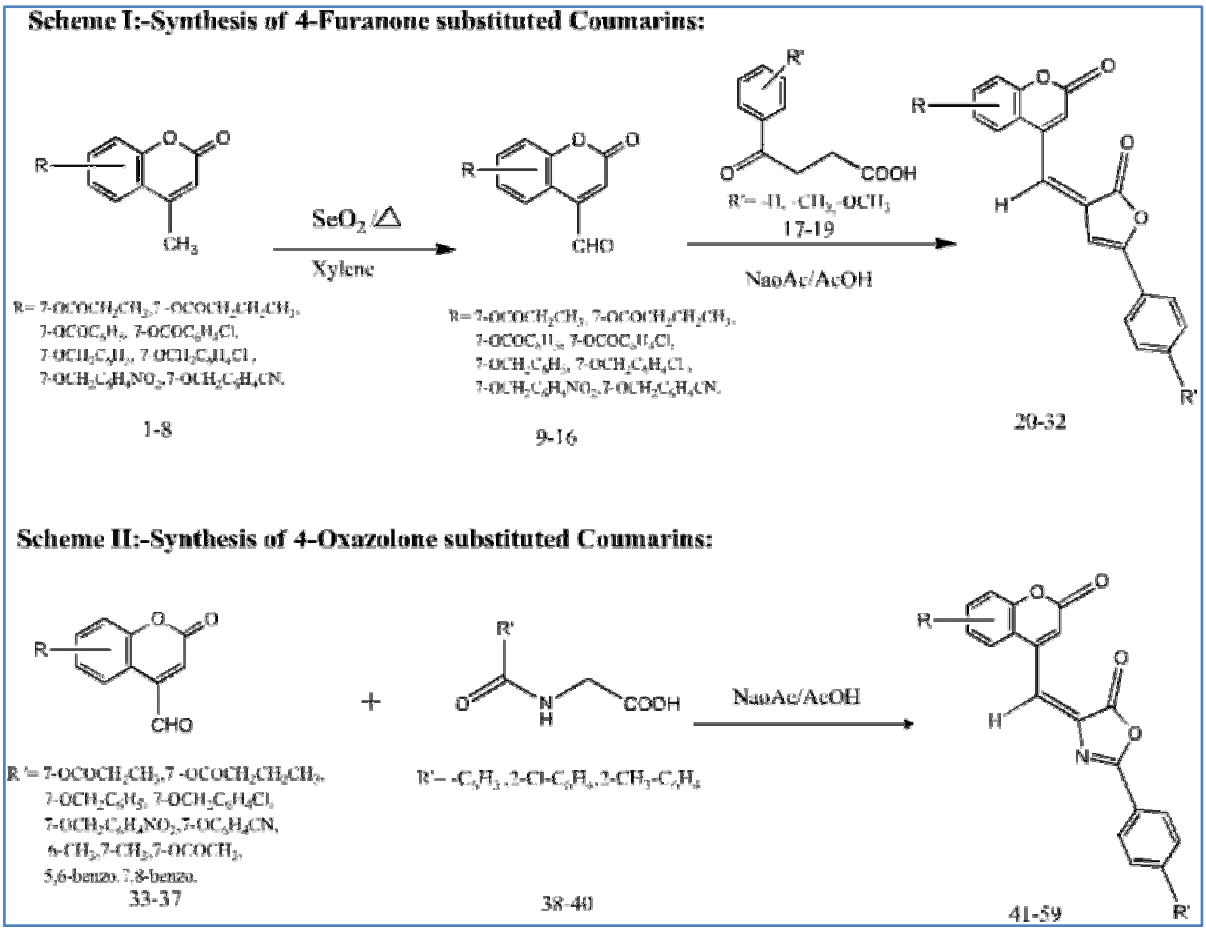

Table 1-Physiological Studies: Absoption Spectra of Furanones 22-32 and Oxazolone 41-59:

No.	R and R'	λmax	No.	R and R'	λmax
20	R= $COCH_2CH_3$, R'=H	390	44	R=$COCH_2CH_2CH_3$,R'=Cl	390
21	R=$COCH_2CH_3$, R'= OCH_3	380	45	R= COC_6H_5, R'= H	360
22	R=$COCH_2CH_2CH_3$,R'= H	420	46	R= COC_6H_4Cl, R'= Cl	370
23	R=$COCH_2CH_2CH_3$,R'=CH_3	395	47	R= $CH_2C_6H_4Cl$, R'= H	370
24	R=$COCH_2CH_2CH_3$,R'=OCH_3	380	48	R= $CH_2C_6H_4Cl$, R'= Cl	380
25	R= COC_6H_5, R'= CH_3	360	49	R= $CH_2C_6H_4NO_2$, R'= Cl	370
26	R= COC_6H_5, R'= OCH_3	330	50	R= $CH_2C_6H_4CN$, R'= H	380
27	R= COC_6H_4Cl, R'= CH_3	360	51	R=6-CH_3, R'= H	380
28	R= $CH_2C_6H_5$, R'= CH_3	410	52	R=6-CH_3, R'= Cl	380
29	R= $CH_2C_6H_5$, R'= OCH_3	400	53	R=6-CH_3, R'= CH_3	380
30	R= $CH_2C_6H_4Cl$, R'= CH_3	350	54	R=7-CH_3, R'= H	380
31	R= $CH_2C_6H_4NO_2$, R'= CH_3	360	55	R=7-CH_3, R'= Cl	360
32	R= $CH_2C_6H_4CN$, R'= CH_3	380	56	R= 7-$OCOCH_3$, R'= Cl	360
33	R= $COCH_2CH_3$, R'= H	370	57	R= 7-$OCOCH_3$, R'= CH_3	370
42	R= $COCH_2CH_3$, R'= Cl	390	58	R= 5,6-C_4H_4, R'= CH_3	370
43	R=$COCH_2CH_2CH_3$,R'= H	380	59	R= 7,8-C_4H_4, R'= CH_3	370

Table 2

Compound No.	Minimum inhibitory concencentration against	
	S.aureus	*E.Coli*
28	400µg/ml	500µg/ml
29	400µg/ml	500µg/ml
31	800µg/ml	500µg/ml
45	500µg/ml	600 µg/ml
46	500 µg/ml	NA
47	400µg/ml	800 µg/ml
52	200µg/ml	-
54	200µg/ml	-
58	200µg/ml	-

References:

1 Lee K h, Kim S H & Piantadosi C, *pharm. Sci,* 63, 9176,1163.

2 Gringuaz A, *Introduction to medical chemistry*(wiley VCH, New york) 1997, pp.305.

3 Avetisyan A A & Tokmadzhyan C G, *Chem.Heterocyclic compd*, 23, 1987, 595.

4 Klunk W E, Covey D F & Ferrendelli J A, *mol Pharmacol,*22, 1982, 431.

5 Harvey S C, *Remington's Pharmaceutical Science*, (Mack publishing company Pennsylvania) 1985, 1189.

6 Conquelet J. D., Conquelet J. M., Payard M., Fauran F. & *Ann pharm. Fr,* 36,1978,51.

7 Lau C K, Brideu C, Chan C C, Charleson S, Cromlish W A, Ethier D, Gauthier J Y, Gordon R, Guay J, Kargman S, *Bio.Med.Chem Lett,* 15, 1999, 3187.

8 Awad W I, Hashem A I & EI-Badry K, *Indian J Chem,* 12, 1975, 1139.

9 Khattab S A & Hosny M, *Indian H Chem,* 19B, 1980, 1038.

10 (a) El–Kousy S M, El-Torgoman A M, El-Basiounyll A A & Hashen A I, *Die Pharmazie* 43, 1988, 80. (b) Filler R, Piasek & Leipoid H A, *Org. Synthesis ,* Coll Vol. V. 1973, 80.

11 Joshi S D, Usgaonkar R N *Indian J Chem,* 21B,.1982, 399-402.

12 a) Ito K, Maruyama J, *Chem.Pharm.Bull,*.1986, 34, 390. b) Robertson A, Sandrock F, Hendry C B, *J* e) Mashelkar U C and Audi A A, *Journal of Indian Council of Chemists*, 18 (1), 2001, 37. f) Ito K, Kaoru N, *J. Heterocycl. Chem*, 25, 1988, 511.

13 Kenny R S and Mashelkar U C, *J. Heterocycl. Chem*, 43, 459, 2006, .

14 Lozanova K ,Vasilev G, Kalcheva V, Dokl, *Dulg. Akad Nauk,* 44(9), 1991, 115, *Chem. Abstr,,* 116, 1992, 2355169.

15 Virinder S Pawar and Nawal K Sharma, *Bio-organic and medicinal chemistry* 11, 2003, 913-929.