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SYNTHESIS AND *IN-VITRO* ANTIOXIDANT, ANTI-INFLAMMATORY ACTIVITY OF THIAZOLYL-THIAZOLIDIN-4-ONE DERIVATIVES

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ABSTRACTS

Thiazoles are important members of heterocyclic compounds It contains sulfur and nitrogen groups arranged in a heterocyclic ring system which imparts many biological activities such as anti-inflammatory, antioxidant, anti tubercular, antibacterial activities. Many drug moieties are based on thiazole ring. Thiazolidinone have been considered as a magic moiety by many researchers because of its important contribution in the field of drug discovery and its property of possessing several various types of biological activities including antitumor activity. It has been a nucleus of interest because of its usefulness as intermediate for the synthesis of many new heterocyclic compounds. In the present study, an attempt has been made to incorporate both the potential rings in same compounds and to synthesize a series of new thiazolyl-thiadiazolidinone derivatives by cyclization of schiff base derivatives. The newly synthesized thiazolyl-thiadiazolidinone derivatives have been characterized by UV, IR, 1HNMR, 13CNMR, Mass spectra and elemental analysis and evaluated for their *in-vitro* anti-inflammatory and antioxidant activities. It was found that the derivatives containing methyl substitution has exhibited good anti-inflammatory and antioxidant activity at low concentrations as compared to the standard drugs.

KEYWORDS: Thiazole; 1, 3-thiazolidin-4-one; antioxidant; anti-inflammatory.

INTRODUCTION

Antioxidants agents inhibit the oxidation of other molecules by undergoing oxidation prior to them. Oxidation of biomolecules leads to generation of Reactive oxygen species (ROS), which causes oxidative damage to cells leading to age related degenerative diseases and many other diseases including cancer.[1,2] Antioxidant drugs acts by terminating these chain reactions and hence protect the cellular damage. Many antioxidant agents are already there in

pharmaceutical practice. However, there is a need to develop new and alternative antioxidant agents because of the side effects caused by existing regimen.[3-6]

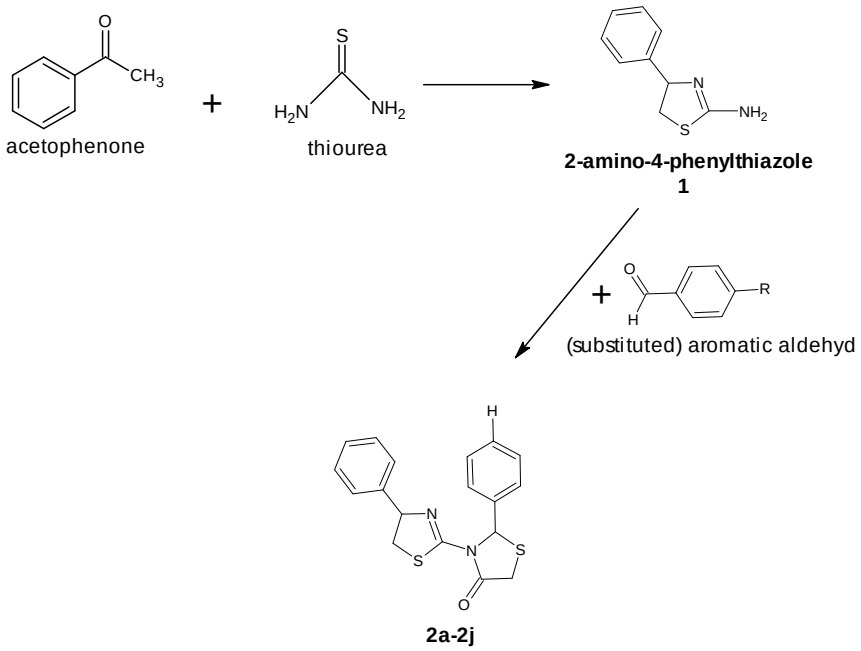
Inflammation comes with the symptoms like with pain and pyresis, commonly non steroidal anti-inflammatory drugs (NSAIDs) are prescribed for the treatment of acute and chronic inflammation. However, there long term use of these drugs brings significant side effects like gastro-intestinal irritations, hypertension, ulcers and nephrotoxicity. Therefore there is a need for discovery of new and safer anti-inflammatory agents.[7-9]

Thiazolidinone is an important member of heterocyclic compounds. It is a saturated form of thiazole having a carbonyl group at fourth carbon atom. It has been considered as a magic moiety by many researchers because of its important contribution in the field of drug discovery and its property of possessing several various types of biological activities including antitumor activity. It has been a nucleus of interest because of its usefulness as intermediate for the synthesis of many new heterocyclic compounds. Thiazolidinone have been reported to exhibit good anti-inflammatory and antioxidant activities by the researchers.[10-15]

MATERIALS AND METHODS

All the melting points were determined in a Thermonik melting point apparatus and are uncorrected. The IR spectra of the synthesized compounds was recorded on a Fourier Transform IR spectrometer (model Shimadzu 8700) in the range of 400 -4000 using KBR pellets and the value of λmax were reported in cm-1. 1HNMR spectra was recorded on λmax - 400 MHz NMR spectrometer using CDCl3 and the chemical shifts (δ) reported are in parts per million downfield using tetramethylsilane (TMS) as internal reference. 13CNMR spectra was recorded on λmax - 400 MHz NMR spectrometer using CDCl3 and the chemical shifts (δ) reported are in parts per million downfield using tetramethylsilane (TMS) as an internal reference. A mass spectrum was recorded on Mass spectrophotometer (model Shimadzu) by LC-MS 2010A. The purity of the compounds was checked by thin-layer chromatography on silica gel-G plates of 0.5mm thickness as stationary phase and combination of n-hexane: ethyl acetate in different ratios as mobile phase. The UV spectra of the synthesized compounds were recorded on UV–Visible spectrophotometer (model Shimadzu 1601) using methanol and the values of wave length (λ max) were reported in nm. Elemental analysis was analyzed by Thermo Finnigan Flash EA 1112 Series.

SCHEME



General procedure for synthesis of 2-amino-4-phenylthiazole (1)

0.1 mol of acetophenone was added with 0.2 mol of thiourea and the slurry was made into which, 0.2 mol of iodine was added. The mixture was heated overnight on steam bath in a closed vessel, and then diluted with water until solution occurs. Small amount of sulphur was removed by filtration. Filtrate was cooled and made alkaline with aqueous ammonia solution. The precipitate was filtered, washed, dried and recrystallized with ethanol.

Synthesis of 2-(substituted-phenyl)-3-(4-phenyl-4,5-dihydro-1, 3-thiazol-2-yl)-1, 3-thiazolidin-4-one(2a-2j)

1 mmol of amino-thiazole and 2mmmol of substituted aromatic aldehyde were stirred in THF under ice cold conditions for 5 minutes followed by addition of 3mmol of thioglycolic acid. After 5 minutes, 1.2 mmol of DCC was added to the reaction mixture at 0˚C and the reaction mixture was stirred for an additional 50 minutes at room temperature. DCU was removed by filtration and the filtrate was concentrated to dryness under reduced pressure. It was taken up in ethyl acetate. The organic layer was successively washed with 5% aqueous citric acid, water, 5% aqueous sodium bicarbonate and finally with brine. The organic layer was dried over sodium sulphate and solvent was removed under reduced pressure to get a crude product that was purified by column chromatography on silica-gel using hexane-ethyl acetate as eluent.

***2-phenyl-3-(4-phenyl-4,5-dihydro-1,3-thiazole-2-yl)-1,3-thiazolidin-4-one* (2a)**

Off-white solid; M.P. 222-224ºC; Yield: 81%; λmax= 310.23; IR (KBR) cm-1: 3439 (=-C-H), 2918 (C-H), 1696 ({C=O), 1491 (cyclic C=N), 1267 (cyclic C-S of thiazolidinone), 700 (aromatic ring); 1HNMR (400 MHz, DMSO D6) δ= 7.67-7.1 [11H, (m, Ar H)], 6.0 [1H, (s, Thiazolidinone, C_5H], 3.8[1H s, Thiazolidinone, C_2H]; 13CNMR(400 MHz CDCl3, ppm): δ= 172 (C_{12}, C-thiadiazole), 156 (C, carbonyl of thiazolidinone), 149(C_{14}, CH_2 thiadiazole) 141(C_6- aromatic CH), 136(C_{17}- Ar-CH), 129-123(10C- Ar-C) 108(C_{15}, CH-thiadiazole), 63 (C_2, CH-Thiazolidinone), 32 (C_5, CH_2- Thiazolidinone); m/e 341(Molecular ion), \CHNS: Found C=63.60%, H=4.24% and N=8.10%. Calculated C=63.88%, H=4.17 and N= 8.28%.

2-(4-methyl-phenyl)-3-(4-phenyl-4, 5-dihydro-1, 3-thiazole-2-yl)-1, 3-thiazolidin-4-one (2b)

Off-white solid; M.P. 246-248ºC; Yield: 88%; λmax= 310.40; IR (KBR) cm-1: 3327 (=-C-H str.), 2928 (N-H str.), 2850 (C-CH_3), 1627 ({C=O), 1575 (cyclic C=N), 1311 (cyclic C-S of thiazolidinone), 725 (aromatic ring); 1HNMR (400 MHz, DMSO D6): δ= 7.3-6.7 [9H (m, Ar-H] 5.3 [1H s, Thiazolidinone,CH], 4.1[2H, s, thiazolidinone, CH_2], 3.9 [2H, s, thiazole, CH_2], 3.8[1H, s, thiazole, CH], 2.0[3H,s, methyl]; 13CNMR(400 MHz CDCl3, ppm): δ= 170 (C, carbonyl of thiazolidinone), 156 (C, thiazole), 140 (C, phenyl), 134 (C, methylphenyl), 128-125 (Ar-C), 63.6 (C_H, Thiazole), 50(C_2 thiazolidinone), 32(C_5, thiazolidinone), 24(CH_2, thiazole), 20 (CH_3); m/e 352 (Molecular ion), CHNS: Found C=4.24%, H=4.64% and N=8.10%. Calculated C=64.74%, H=4.38 and N= 7.95%.

***2-(4-methoxy-phenyl)-3-(4-phenyl-4, 5-dihydro-1, 3-thiazole-2-yl)-1, 3-thiazolidin-4one* (2c)**

White solid; M.P. 188-190ºC; Yield: 82%; λmax= 310.40; IR (KBR) cm-1: 3446 (=-C-H str.), 3329 (O-CH_3), 2928 (C-H), 1678({C=O), 1512 (cyclic C=N), 1172 (cyclic C-S of thiazolidinone), 734 (aromatic ring); 1HNMR (400 MHz, DMSO D6) δ= 7.3-6.7 [9H (m, Ar-H] 5.3 [1H s, Thiazolidinone,CH], 4.1[2H, s, thiazolidinone, CH_2], 3.9 [2H, s, thiazole, CH_2], 3.8[1H, s, thiazole, CH], 3.6[3H,s, methoxy]; 13CNMR(400 MHz CDCl3, ppm): δ= 170 (C, carbonyl of thiazolidinone), 156 (C, thiazole), 140 (C, phenyl), 134 (C, methylphenyl), 128-125 (Ar-C), 63.6 (C_H, Thiazole), 55.5 (CH_3), 50(C_2 thiazolidinone), 32(C_5, thiazolidinone), 24(CH_2, thiazole),; m/e 369 (Molecular ion); CHNS: Found C=61.88%, H=4.42% and N=7.65%. Calculated C=61.93%, H=4.38 and N= 7.60%.

***2-(4-hydroxyphenyl)-3-(4-phenyl-4,5-dihydro-1,3-thiazole-2-yl)-1,3-thiazolidin-4-one* (2d)**

Off-white solid; M.P. 256-258ºC; Yield: 84%; λmax= 308.40; IR (KBR) cm-1: 3327 (=-C-H

str.), 2928 (C-H), 1670({C=O), 1496 (cyclic C=N), 1087 (cyclic C-S of thiazolidinone), 825 (aromatic ring), 731 (C-Cl); 1HNMR (400 MHz, DMSO D6): δ= 7.3-6.7 [9H (m, Ar-H] 5.3 [1H s, Thiazolidinone,CH], 5.0[1H, s, OH], 4.1[2H, s, thiazolidinone, CH_2], 3.9 [2H, s, thiazole, CH_2], 3.8[1H, s, thiazole, CH]; 13CNMR(400 MHz CDCl3, ppm): δ= 170 (C, carbonyl of thiazolidinone), 160 (C, C-OH), 156 (C, thiazole), 140 (C, phenyl), 134 (C, methylphenyl), 128-125 (Ar-C), 63.6 (C_H, Thiazole), 50(C_2 thiazolidinone), 32(C_5, thiazolidinone), 24(CH_2, thiazole); m/e 355 (Molecular ion), 541, 542; CHNS: Found C=60.92%, H=4.01% and N=7.95%. Calculated C=60.99%, H=3.98 and N= 7.90%.

2-(4-chlorophenyl)-3-(4-phenyl-4,5-dihydro-1,3-thiazole-2-yl)-1,3-thiazolidin-4-one (2e)
White solid; M.P. 204-206ºC; Yield: 78%; λmax= 309.40; IR (KBR) cm-1: 3354 (broad trough of carboxyl group), 3228(-CH= str.), 1600 (C=O str.), 1263 (cyclic C-N), 1078 (C-N of amino group), 808 (cyclic C-S of thiazolidinone), 1HNMR (400 MHz, DMSO D6): δ= 7.3-6.7 [9H (m, Ar-H] 5.3 [1H s, Thiazolidinone,CH], 5.0[1H, s, OH], 4.1[2H, s, thiazolidinone, CH_2], 3.9 [2H, s, thiazole, CH_2], 3.8[1H, s, thiazole, CH]; 13CNMR(400 MHz CDCl3, ppm): δ= 170 (C, carbonyl of thiazolidinone), 160 (C, C-OH), 156 (C, thiazole), 140 (C, phenyl), 134 (C, methylphenyl), 128-125 (Ar-C), 63.6 (C_H, Thiazole), 50(C_2 thiazolidinone), 32(C_5, thiazolidinone), 24(CH_2, thiazole); m/e 372, 374 (Molecular ion); CHNS: Found C=55.39%, H=4.07% and N=6.83%. Calculated C=57.98%, H=3.31 and N= 7.51%.

***2-(3-nitrophenyl)-3-(4-phenyl-4,5-dihydro-1,3-thiazole-2-yl)-1,3-thiazolidin-4-one*(2f)**
yellow solid; M.P. 178-180ºC; Yield: 56%, λmax= 310.40; IR (KBR) cm-1 3326(=-C-H str.), 2916 (C-H), 1627({C=O), 1501 (cyclic C=N), 1099(cyclic C-S of thiazolidinone), 840 (aromatic ring), 723 (C-Cl); 1HNMR (400 MHz, DMSO D6): δ= 8.02-7.6[9H (m, Ar-H] 5.3 [1H s, Thiazolidinone, CH], 5.0[1H, s, OH], 4.1[2H, s, thiazolidinone, CH_2], 3.9 [2H, s, thiazole, CH_2], 3.8[1H, s, thiazole, CH]; 13CNMR(400 MHz CDCl3, ppm): δ= 169 (C, Carboxyl), 162 (C, carbonyl of thiazolidinone), 158 (C, C-OH), 146 (C, benzoic acid),140-121 (Ar-C), 118, 115(C, thiadiazole), 46(C, CNH_2), 63 (C_2, Thiazolidinone),; m/e 384(Molecular ion), CHNS: Found C=56.30%, H=3.48% and N=10.94%. Calculated C=56.38%, H=3.42 and N= 10.96%.

***2-(2,3-dichlorophenyl)-3-(4-phenyl-4,5-dihydro-1,3-thiazole-2-yl)-1,3-thiazolidin-4-one* (2g)**

Off-white solid; M.P. 166-168 ºC; Yield: 91 %%; λmax= 310.28; IR (KBR) cm-1: 3326(=-C-H str.), 2916 (C-H), 1627({C=O), 1501 (cyclic C=N), 1099(cyclic C-S of thiazolidinone), 840 (aromatic ring), 723 (C-Cl); 1HNMR (400 MHz, DMSO D6) δ= 7.3-6.7 [9H (m, Ar-H] 5.3 [1H s, Thiazolidinone, CH], 4.1[2H, s, thiazolidinone, CH_2], 3.9 [2H, s, thiazole, CH_2], 3.8[1H, s, thiazole, CH], 3.6[3H,s, methoxy]; 13CNMR(400 MHz CDCl3, ppm): δ= 170 (C, carbonyl of thiazolidinone), 156 (C, thiazole), 140 (C, phenyl), 134 (C, methylphenyl), 128-125 (Ar-C), 63.6 (C_H, Thiazole), 55.5 (CH_3), 50(C_2 thiazolidinone), 32(C_5, thiazolidinone), 24(CH_2, thiazole); m/e 407,409 (Molecular ion); CHNS: Found C=53.21%, H=2.92% and N=6.94%. Calculated C=53.07%, H=2.97 and N= 6.88%.

2-(2-hydroxyphenyl)-3-(4-phenyl-4,5-dihydro-1,3-thiazol-2-yl)-1,3-thiazolidin-4-one (2h)

Off-white solid; M.P. 208-210ºC; Yield: 83%; λmax= 310.32; IR (KBR) cm-1: 3327 (=-C-H str.), 2928 (C-H), 1663 ({C=O), 1496 (cyclic C=N), 1284 (cyclic C-S of thiazolidinone), 1163 (C-OH of secondary cyclic alcohol), 833 (mono substituted aromatic ring); 1HNMR (400 MHz, DMSO D6): δ= 7.3-6.7 [9H (m, Ar-H] 5.3 [1H s, Thiazolidinone, CH], 5.0[1H, s, OH], 4.1[2H, s, thiazolidinone, CH_2], 3.9 [2H, s, thiazole, CH_2], 3.8[1H, s, thiazole, CH]; 13CNMR(400 MHz CDCl3, ppm): δ= 170 (C, carbonyl of thiazolidinone), 160 (C, C-OH), 156 (C, thiazole), 140 (C, phenyl), 134 (C, methylphenyl), 128-125 (Ar-C), 63.6 (C_H, Thiazole), 50(C_2 thiazolidinone), 32(C_5, thiazolidinone), 24(CH_2, thiazole); m/e 354(Molecular ion); CHNS: Found C=61.19%, H=4.18% and N=8.05%. Calculated C=60.99%, H=3.98 and N= 7.90%.

***2-(3,4-dimethoxyphenyl)-3-(4-phenyl-4,5-diydro-1,3-thiazole-2-yl)-1,3-thiazolidin-4-one* (2i)**

White solid; M.P. 218-220ºC; Yield 68%; λmax= 213.40; IR (KBR) cm-1: 3446 (=-C-H str.), 3329 (O-CH_3), 2928 (C-H), 1678({C=O), 1512 (cyclic C=N), 1172 (cyclic C-S of thiazolidinone), 734 (aromatic ring); 1HNMR (400 MHz, DMSO D6) δ= 7.3-6.7 [9H (m, Ar-H] 5.3 [1H s, Thiazolidinone,CH], 4.1[2H, s, thiazolidinone, CH_2], 3.9 [2H, s, thiazole, CH_2], 3.8[1H, s, thiazole, CH], 3.6[3H,s, methoxy]; 13CNMR(400 MHz CDCl3, ppm): δ= 170 (C, carbonyl of thiazolidinone), 156 (C, thiazole), 140 (C, phenyl), 134 (C, methylphenyl), 128-125 (Ar-C), 63.6 (C_H, Thiazole), 55.5 (CH_3), 50(C_2 thiazolidinone), 32(C_5, thiazolidinone),

24(CH_2, thiazole),; m/e 485(Molecular ion), 478, 460, 301(100); CHNS: Found C=59.86%, H=4.93% and N=6.91%. Calculated C=60.28%, H=4.55 and N= 7.03%.

***2-(3-nitrophenyl)-3-(4-phenyl-4,5-dihydro-1,3-thiazole-2-yl)-1,3-thiazolidin-4-one*(2j)**

Yellow solid; M.P. 184-186ºC; Yield: 84%; λmax= 213.40; IR (KBR) cm-13481(COOH), 3161 (-OH str.), 2916 (C=O of carboxyl group), 2783 (C-H str. of CH_3), 1693 (C=O str.), 1313 (C-N), 823 (cyclic C-S of thiazolidinone); 1HNMR (400 MHz, DMSO D6): δ= 8.02-7.6[9H (m, Ar-H] 5.3 [1H s, Thiazolidinone,CH], 5.0[1H, s, OH], 4.1[2H, s, thiazolidinone, CH_2], 3.9 [2H, s, thiazole, CH_2], 3.8[1H, s, thiazole, CH]; 13CNMR(400 MHz CDCl3, ppm): δ= 169 (C, Carboxyl), 162 (C, carbonyl of thiazolidinone), 158 (C, C-OH), 146 (C, benzoic acid),140-121 (Ar-C), 118, 115(C, thiadiazole), 46(C, CNH_2), 63 (C_2, Thiazolidinone),; m/e 385(Molecular ion), CHNS: Found C=56.15%, H=3.84% and N=10.83%. Calculated C=56.38%, H=3.42 and N= 10.96%.

Anti-Inflammatory Activity

a) Protein denaturation assay

A solution of 0.2% w/v of BSA was prepared in tris buffer saline and pH was adjusted to 6.8 using glacial acetic acid. Stock solutions of 1000µg/ml of all test samples were prepared by using methanol as a solvent. From the stock solutions two different concentrations of 100µg/ml and 200µg/ml were prepared by using methanol as a solvent. 100µg/ml (0.1ml) of each test sample was transferred to volumetric flask (10ml) using 1ml micropipette. 5ml of 0.2% BSA was added to all of the above flasks. The control consists of 5ml 0.2% w/v BSA solution with 0.1ml methanol. The 0.1ml standard consisted 100µg/ml of indomethacin in methanol with 5ml 0.2% w/v BSA solution. The volumetric flasks were heated at 72°C for five minutes and then cooled for 10 min. the absorbance of these solutions was determined by using spectrophotometer at a wavelength of 660 nm. The % denaturation of the protein (% inhibition) was determined.

$$\% \text{ inhibition} = \frac{\text{Absorbance of Control} - \text{Absorbance of Test}}{\text{Absorbance of Control}} \times 100$$

b) Trypsin (Proteinase) inhibitory assay

The reaction mixtures (2.0 ml) contained 0.06 mg trypsin, 1.0 ml. 25 mM tris-HCl buffer (pH 7.4) and 1.0 ml of different concentrations of compounds (10, 25 and 50 µg/ml). The mixtures were incubated at 37°C for 5 minutes then 1.0 ml of 0.8% (w/v) casein was added.

The mixtures were incubated for an additional 20 minutes. Then 2.0 ml of 70% (v/v) perchloric acid was added to terminate the reaction. The cloudy suspension was centrifuged and absorbance of the supernatant was read at 280 nm against buffer as blank.[16-18]

The percentage of inhibition was calculated as follows.

$$\% \text{ inhibition} = \frac{\text{Absorbance of Control} - \text{Absorbance of Test}}{\text{Absorbance of Control}} \times 100$$

Antioxidant Activity

a) 2, 2-diphenyl-1-picryl hydrazine (DPPH method)

10 mg of standard ascorbic acid was dissolved in methanol. From this stock solution dilutions were made to obtain concentrations of 10 to 40 µg/ ml. 1 ml from each of these solutions was taken in different volumetric flasks to which 1 ml of DPPH solution was added and volume was made up to 10 ml. The test solution were prepared in similar manner as that of standard ascorbic acid and the absorbance were recorded at 516 nm after duration of 30 min.

$$\% \text{ inhibition} = \frac{\text{Absorbance of Control} - \text{Absorbance of Test}}{\text{Absorbance of Control}} \times 100$$

b) Nitric oxide scavenging assay

Sodium nitroprusside (10mM) in phosphate buffered saline was mixed with different concentrations (5 - 200µg/ml) of test compounds and incubated at 300 C for 2 hours. After the incubation period, 0.5 ml of Griess reagent (1% sulfanilamide, 2% H_3P0_4 and 0.1% N-(1-naphthyl) ethylenediamine dihydrochloride) was added. The absorbance of the resulted chromophore was recorded at 550nm. Inhibition of nitrite formation by the compounds and the standard antioxidant ascorbic acid were calculated relative to the control and the percentage inhibition was calculated.

$$\% \text{ inhibition} = \frac{\text{Absorbance of Control} - \text{Absorbance of Test}}{\text{Absorbance of Control}} \times 100$$

RESULTS AND DISSCUSSION

Anti-inflammatory activity: Compounds exhibited good *in vitro* anti-inflammatory activity as compared to standard indomethacin. Two different mechanism of anti-inflammatory

activity were studied and compounds were found to exhibit good activity via both the mechanisms.

Protein denaturation assay

Compounds 2a, 2f and 2j were found to be most active while others exhibited moderate activity.

S. N.	Compound code	% Inhibition	
		100µg/ml	200µg/ml
1.	2a	67.69	85.82
2.	2b	74.24	82.19
3.	2c	67.12	78.09
4.	2d	61.53	72.28
5.	2e	76.24	83.90
6.	2f	88.51	92.54
7.	2g	73.36	84.20
8.	2h	69.37	78.28
9.	2i	75.28	84.54
10.	2j	76.84	87.62
	Indomethacin	**90%**	**91.81%**

Trypsin (Proteinase) inhibitory assay

Compounds 2a, 2d, 2e and 2h were found to be most active while others exhibited moderate activity.

S. N.	Compound code	% Inhibition		
		10µg/ml	25µg/ml	50µg/ml
1.	2a	71.5	75.3	87.0
2.	2b	39.3	47.19	59.2
3.	2c	62.1	69.3	74.4
4.	2d	80.8	86.2	89.8
5.	2e	79.2	83.9	86.6
6.	2f	58.6	66.9	78.3
7.	2g	76.3	82.2	84.6
8.	2h	49.3	62.3	88.6
9.	2i	65.6	72.6	79.8
10.	2j	52.8	60.6	76.8
	Indomethacin	**88.10**	**89.15**	**90.18**

Antioxidant Activity

Antioxidant assay was performed using two different methods to study the mechanism of anti-inflammatory action of the compounds. The compounds exhibited better results in DPPH method as compare to nitric oxide scavenging method.

2, 2-diphenyl-1-picryl hydrazine (DPPH method)

All the compounds exhibited high anti-inflammatory potential while 2a, 2c, 2j exhibited highest percentage inhibition.

S. N.	Compound code	% Inhibition			
		10µg/ml	25µg/ml	50µg/ml	100µg/ml
1.	2a	80.1	90.5	92.3	94.2
2.	2b	85.7	86.3	86.7	87.5
3.	2c	85.6	88.0	90.9	94.6
4.	2d	85.1	90.5	90.7	92.1
5.	2e	89.8	90.5	93.2	93.6
6.	2f	80.5	83.3	86.7	88.8
7.	2g	77.6	79.4	83.5	93.6
8.	2h	76.9	85.6	87.4	93.4
9.	2i	83.0	83.5	85.6	93.5
10.	2j	80.9	90.5	92.3	97.4
	Ascorbic acid	**92.3**	**96.5**	**97.1**	**99.9**

Nitric oxide scavenging assay

The compounds were found to be moderately active via nitric oxide scavenging method. 2a, 2b, 2g and 2j exhibited highest percentage inhibition.

S. N.	Compound code	% Inhibition			
		10µg/ml	25µg/ml	50µg/ml	100µg/ml
1.	2a	58.7	65.5	68.5	71.3
2.	2b	55.8	58.0	60.8	72.1
3.	2c	47.2	52.7	56.8	68.5
4.	2d	43.6	52.8	54.2	66.8
5.	2e	39.5	37.6	54.6	61.7
6.	2f	46.5	55.9	57.2	59.3
7.	2g	53.6	65.8	70.7	73.2
8.	2h	37.6	43.3	48.6	52.28
9.	2i	43.6	56.8	58.2	63.13
10.	2j	58.7	63.3	67.0	74.8
	Ascorbic acid	**89.7**	**90.3**	**92.2**	**97.4**

CONCLUSION

Thiazolidinone derivatives were synthesized and the structure was verified with spectral characterization. The final derivatives were evaluated for their anti-inflammatory activity. The compounds were found to exhibit good anti-inflammatory and antioxidant activity. The compounds were found to exhibit better antioxidant activity via DPPH method as compared to NO scavenging method. It can be said that the Thiazolidinone would react better with

oxygen free radical than the nitrogen free radicals. Thiazolidinone may be a potential drug moiety for designing of new anti-inflammatory and antioxidant agents.

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