



SYNTHESIS, CHARACTERIZATION AND ENZYME INHIBITORY STUDIES OF 4-THIAZOLIDONE DERIVATIVES

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ABSTRACT

A series of new 4-thiazolidinone derivatives was synthesized, characterized by spectral techniques, and screened for All the newly synthesized compounds were screened for in vitro α -amylase inhibitory activity at 5, 10, 25, 50, 100, 200, 400, 500 μ g/ml concentration. Among the synthesized compounds, T1 and T5 showed good percentage of inhibition at all concentration (5 μ g/ml-500 μ g). The IC₅₀ values for these compounds were found to be 25 μ g/ml and 30 μ g/ml respectively which are close to IC₅₀ value of acarbose (10 μ g/ml). T3 and T4 showed moderate α -amylase inhibitory activity at all concentrations. The IC₅₀ value for these compounds found to be 59 μ g/ml and 110 μ g/ml respectively. Among the test compounds, compound 2-(4-chlorophenyl)-3-(4, 6-dimethylpyrimidin-2-yl)thiazolidin-4-one (T1) was found to be the most active agent which showed 88.00 μ g/ml α -amylase inhibition in the highest concentration, which have p-chloro phenyl group in the 4-thiazolidinone nucleus.

KEYWORDS: α -amylase, 4-thiazolidinone, IC₅₀.

INTRODUCTION

Diabetes mellitus is a major endocrine disorder affecting nearly 10% of the population all over the world. It is characterized by hyperglycemia and disturbances of carbohydrate, protein and fat metabolisms, secondary to an absolute or relative lack of the hormone insulin. The number of people in the world with diabetes has increased dramatically over recent years. It is also predicted that by 2030, India, China and the United States will have the largest number of people with diabetes.

Currently treatment of diabetes, in addition to insulin supplement includes many oral hypoglycemic agents along with appropriate diet and exercise. The treatment goal of diabetic patients is to maintain near normal levels of glycemic control, in both fasting and post-prandial conditions. Postprandial hyperglycemia has been proposed as an independent risk factor for diabetes mellitus. Therefore, control of postprandial hyperglycemia is suggested to be important in the treatment of diabetes.

One of the effective method to control diabetes is to inhibit the activity of α -amylase enzyme which is responsible for the breakdown of starch to more simple sugars (dextrin, maltotriose, maltose, and glucose). This is contributed by α -

amylase inhibitors, which delays the glucose absorption rate thereby maintaining the serum blood glucose in hyperglycemic individuals. This study is focused to investigate the inhibitory potentials of the synthesized thiazolidinone derivatives on α -amylase, the key enzyme responsible for carbohydrate hydrolysis.

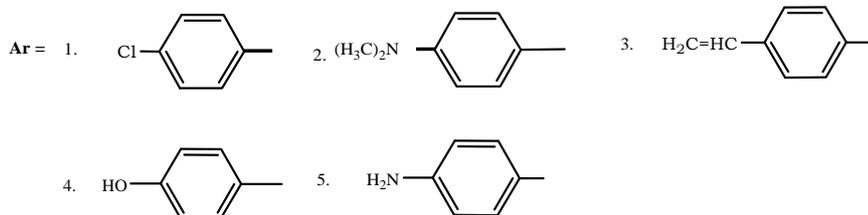
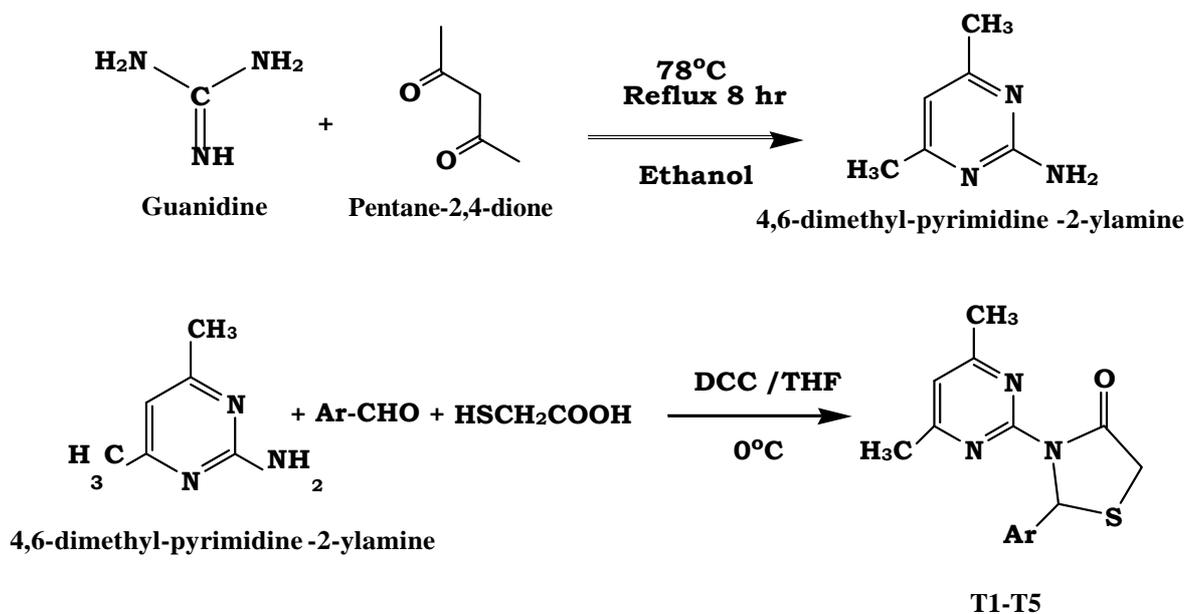
4-thiazolidinone possess a wide spectrum of biological and pharmacological activity due to the presence of nitrogen and sulfur which is considered to be responsible for the structural features to impart their activities. Despite an optimal use of available antidiabetic drugs (ADDs), many patients fail to experience therapeutic efficacy and others do so only at the expense of significant failure in reduction of elevated blood sugar level and toxic side effects. The limitations with the conventional ADDs highlighted the need for developing newer antidiabetic agents with less toxic and more effective drugs are required. Thiazolidinones are five membered ring system containing sulphur and nitrogen atom, received a much attention of medicinal chemists due to their potential biological activities. Substituent's at C-4 position of 4-thiazolidinone moiety results in potent α -amylase inhibitory activity. Prompted by these reports, we



aimed to prepare the following series of novel 4-thiazolidinone derivatives as potent α -amylase inhibiting agents.

SCHEME

Synthesis of 2-(4-substituted phenyl)-3-(4,6-dimethylpyrimidin-2-yl)thiazolidin-4-one (T1-T5).

SCHEME



MATERIALS AND METHOD

Melting points (mp) were taken in open capillaries on thomas hoover melting point apparatus and are uncorrected. The IR spectra were recorded in film or in potassium bromide disks on a Perkin-Elmer 398 spectrometer. The ^1H spectra were recorded on a DPX-500 MHz Bruker FT-NMR spectrometer. The chemical shifts were reported as parts per million (δ ppm) tetramethylsilane (TMS) as an internal standard. Mass spectra were obtained on a JEOL-SX-102 instrument using fast atom bombardment (FAB positive). Elemental analysis was performed on a Perkin-Elmer 2400 C, H, N analyzer and values were within the acceptable limits of the calculated values. The progress of the reaction was monitored on readymade silica gel plates (Merck) using chloroform-methanol (9:1) as a solvent system. Iodine was used as a developing agent. Spectral data (IR, NMR and mass spectra) confirmed the structures of the synthesized compounds and the purity of these compounds was ascertained by microanalysis. Elemental (C, H, N) analysis indicated that the calculated and observed values were within the acceptable limits ($\pm 0.4\%$). All chemicals and reagents were obtained from Aldrich (USA), or Spectro chem Pvt.Ltd (India) and were used without further purification.

General procedure for synthesis of 2-(4-substituted phenyl)-3-(4,6- dimethylpyrimidin-2-yl)thiazolidin-4-one (T1-T5).

4-Thiazolidinones were synthesized in two steps. In the first step, 2- aminopyrimidine derivatives were synthesized by the reaction of 1,3-dicarbonyl compounds with guanidine. Final compounds (T1-T5) were synthesized by the reaction of compounds of step 1 with substituted aromatic aldehydes and mercaptoacetic acid, using DCC as intramolecular cyclizing agent (Figure 1).

Step-I: General procedure for the synthesis of 4,6-dimethyl-pyrimidin-2- ylamine. Equimolar solution of dicarbonyl compounds and guanidine in ethanol was refluxed at 78°C for 8 hr. The reaction mixture was then concentrated to dryness under reduced pressure and the residue was partitioned in ethyl acetate. The organic layer was successively washed with water and then finally with ether. The organic layer was dried over sodium sulphate and the solvent was removed under reduced pressure to get 4,6- dimethyl-pyrimidin-2-ylamine⁸⁶. The progress of the reaction was monitored by TLC, using methanol in chloroform (2:98) ratio.

Step-II: General procedure for the synthesis of compounds (T1-T5). A solution of 4,6-dimethyl-pyrimidin-2-ylamine (2 mol) and various substituted aldehydes (4 mol) was stirred in THF, under ice cold conditions for 5 min, followed by the addition of mercaptoacetic acid (3 mol). After 5 min, DCC (2 mol) was added to the reaction mixture at 0°C and the reaction mixture stirred for an additional 5 hr at room temp and filtered. The filtrate was concentrated to dryness under reduced pressure and the residue was extracted with ethyl acetate. The organic layer was successively washed with 5% aqueous citric acid, water, and 5% aqueous sodium hydrogen carbonate and then finally with brine. The organic layer was dried over sodium sulphate and the solvent was removed under reduced pressure to get the products⁸⁷ (T1-T5). The progress of the reaction was monitored by TLC, using the solvent system methanol: chloroform (2:98).

Synthesis of 2-(4-chlorophenyl)-3-(4, 6-dimethylpyrimidin-2-yl)thiazolidin-4- one (T1)

Yield	: 2.56 g; 77.0 % w/w
Melting Point	: 216-218 $^\circ\text{C}$
Rf Value	: 0.86 (methanol: chloroform (2 :98). Molecular Formula : $\text{C}_{15}\text{H}_{14}\text{ClN}_3\text{OS}$
Molecular Weight	: 319.81(M+), 321(M+2)
IR (KBr) cm^{-1}	: 3048 (Ar-CH), 2825 (CH_3), 1710 (C=O), 1597 (C=N Str), 688 (C- Cl).
^1H NMR (CDCl_3) δ ppm:	2.35 (s, 3H, CH_3), 2.38 (s, 3H, CH_3), 3.38 (s, 1H, CH), 6.86
	(d, $J = 8.0$ Hz, 1H, Ar-H), 7.00 (d, $J = 8.0$ Hz, 2H, Ar-H), 7.15 (d, $J = 8.0$ Hz, 2H, Ar-H).
Elemental Analysis	
Calculated	: C, 56.33; H, 4.41; N, 13.14.
Found	: C, 56.31; H, 4.41; N, 13.12.

**Synthesis of 2-(4- (dimethylamino) phenyl)- 3- (4,6-dimethylpyrimidin-2-yl) thiazolidin-4-one (T2).**

Yield : 2.87 g; 83.4 % w/w

Melting Point : 245-247 °C

Rf Value : 0.79 (methanol: chloroform (2 :98). Molecular Formula : C₁₇H₂₀N₄OS

Molecular Weight : 328.43(M+)

IR (KBr) cm⁻¹ : 3085 (Ar-CH), 2948 (CH₃), 1712 (C=O), 1597 (C=N Str),1289(N(CH₃)₂), 1191 (C-S).¹H NMR (CDCl₃) δ ppm: 2.35 (s, 3H, CH₃), 2.38 (s, 3H, CH₃), 2.85(6H, CH₃), 3.35(s, 1H, CH), 6.47 (s, *J* = 8.0 Hz, 2H, Ar-H), 6.88 (d, *J* = 8.0 Hz, 2H, Ar-H), 6.90 (s, *J* = 8.0 Hz, 1H, Ar-H).

Elemental Analysis

Calculated : C, 62.17; H, 6.14; N, 17.06

Found : C, 62.15; H, 6.13; N, 17.04

Synthesis of 3-(4,6-dimethylpyrimidin-2-yl)-2-(4-vinylphenyl)thiazolidin-4- one (T3)

Yield : 2.68 g; 77.6 % w/w

Melting Point : 238-240 °C

Rf Value : 0.72 (methanol: chloroform (2 :98). Molecular Formula : C₁₇H₁₇N₃OS

Molecular Weight : 314.4(M+)

IR (KBr) cm⁻¹ : 3058 (Ar-CH), 2852 (CH₃), 1698 (C=O), 1628 (C=N Str), (1510) (CH=CH₂), 1191 (C-S).¹H NMR (CDCl₃) δ ppm: 2.32 (s, 3H, CH₃), 2.36 (s, 3H, CH₃), 3.35(s, 1H, CH),5.62(s, 2H, CH₂), 5.92(s, 1H, CH₂), 6.63(s, 1H, CH), 6.47 (s,*J* = 8.0 Hz, 2H, Ar-H), 6.86 (d, *J* = 8.0 Hz, 1H, Ar-H), 7.00 – 7.18 (d, *J* = 8.0 Hz, 3H, Ar-H).

Elemental Analysis

Calculated : C, 65.57; H, 5.50; N, 13.49.

Found : C, 65.55; H, 5.50; N, 13.47.

Synthesis of 2-(4-hydroxyphenyl)-3-(4,6-dimethylpyrimidin-2-yl)thiazolidin- 4-one (T4).

Yield : 2.66 g; 80.7 % w/w

Melting Point : 264-266 °C

Rf Value : 0.78 (methanol: chloroform (2 :98) Molecular Formula : C₁₅H₁₅N₃O₂S

Molecular Weight : 301.36(M+)

IR (KBr) cm⁻¹ : 3532 (OH, broad), 3085 (Ar-CH), 2967 (CH₃), 1703

(C=O), 1585 (C=N Str), 1191(C-S-C).

¹H NMR (CDCl₃) δ ppm: 2.35 (s, 3H, CH₃), 2.39 (s, 3H, CH₃),



3.35(s,1H,CH),5.00(s,1H,OH),5.92(s,1H,CH₂),

6.61(s,2H,CH),6.86 (d,*J*=8.0Hz,1H,Ar-H),

6.81- 6.89 (d, *J* =8.0Hz, 3H, Ar-H).

Elemental Analysis

Calculated : C, 59.78; H, 5.02; N, 13.94.

Found : C, 59.76; H, 5.02; N, 13.92.

Synthesis of 2-(4-aminophenyl)-3-(4,6-dimethylpyrimidin-2-yl)thiazolidin-4- one (T5)

Yield : 2.93 g; 84.1.0 % w/w.

Melting Point : 255-257 °C

Rf Value : 0.81 (methanol: chloroform (2 :98) Molecular Formula :
C₁₅H₁₆N₄OS

Molecular Weight : 300.38(M+)

IR (KBr) cm⁻¹ : 3383 (NH₂), 3076(Ar-CH), 2918 (CH₃),

1691(C=O), 1597 (C=NStr), 1191 (C-S).

¹H NMR (CDCl₃) δ ppm : 2.32 (s, 3H,CH₃), 2.37(s,3H,CH₃), 3.33(s,1H,CH), 4.0

(s,1H,NH₂),5.92(s,1H,CH₂),6.34(s,2H,CH),6.86

(d,*J*=8.0Hz,1H,Ar- H),6.81-6.89 (d,*J*=8.0Hz, 3H, Ar-H).

Elemental Analysis

Calculated : C, 59.98; H, 5.37; N, 18.65.

Found : C, 59.97; H, 5.37; N, 18.63.

CHROMATOGRAPHY STUDIES OF SYNTHESIZED COMPOUNDS THIN LAYER CHROMATOGRAPHY

Thin Layer Chromatography or TLC is a solid-liquid form of chromatography here the stationary phase is a polar absorbent and the mobile phase can be a single solvent or Combination of solvents. TLC is in expensive technique and quick that can be used for determine the number of components in a mixture, verify a substance's identity, monitor the process of a reaction, determine appropriate condition for column chromatography, analyze the fractions obtained from column chromatography.

MATERIALS AND METHODS

1. Preparation of plates

Silicagel G was mixed in a glass mortar to smooth consistency with the requisite amount of water and slurry was quickly transferred to hespreader. The mixtures have been spread over the plates in thickness of 0.2mm and allow setting in to a suitable holder and after 30minutes; plates were dried at 120⁰C, for further activation of the absorbent.

2. Sample application

About 2 mm of absorbent from the edge of plate was removed to gives sharply defined edges. 2-5μl volumes of synthesized compounds were spotted with the help of capillary tubes, just above1cm of the bottom of coated plates.

3. Development chamber



The chromatographic chamber was lined with filter paper dipping in to mobile phase so as to maintain the atmospheric saturation with solvent vapors in the chamber. The solvent front was allowed to rise to distance of about 12cm from the baseline on the plate was removed from the tank and allowed to dry in the air.

4. Solvent system

The choice of best developing solvent is one of the most important decisions in practical TLC by review of literature survey on by knowing nature of compounds, this solvent system used is (methanol: chloroform (2 :98).

5. Detection of components

The spots were visualized under iodine chamber.

COLUMN CHROMATOGRAPHY

Purification of synthesized compounds was done by column chromatography.

Materials

1. Glass column of size 45 cm x 3cm.
2. Silicagel for column chromatography 60-120 mesh size.
3. Eluting solvent system (methanol: chloroform (2 :98).

Preparation of column

The silica gel 60-120 mesh size was made in to slurry with the above solvent system. The bottom of the column was plugged with little glass wool. Then the slurry was poured in to the column, which is filled with solvent after two third of the column areas were filled with slurry. It was set aside for 30 minutes and eluting solvent was passed through column for several time ensure good packing of the column. After the adsorbents are settled, a filter paper was kept to prevent disturbance of the two layer of the adsorbent as fresh mobile phase to be added to column for the process of elution. The fractions were collected for every 5ml and analyzed for the presence of different of similar compound by running TLC and then allow evaporating to get the residue.

PHARMACOLOGICAL SCREENING

ENZYME INHIBITION STUDIES DRUGS AND CHEMICALS

Acarbose (Bicon Ltd, Bangalore), porcine pancreatic α -amylase (Sigma-Aldrich, USA), Glucose assay kits (Agappe Diagnostics, Kerala) 3, 5-dinitro salicylic acid (HiMedia, Mumbai) and potato starch and maltose (Lobachemie, Mumbai) were purchased for the study. All the other chemicals used in the study were of analytical grade and were of commercial grade and obtained from respective manufacturers.

IN VITRO ANTIDIABETIC STUDIES

In vitro anti-diabetic potential of the synthesized thiazolidinone derivatives were studied by performing the enzyme inhibition assay using carbohydrate digestive enzymes i.e., α -amylase.

IN VITRO INHIBITION OF α - AMYLASE

The study was carried out with porcine pancreatic α -amylase with starch as substrate. Acarbose was selected as the standard drug for comparison of results and thiazolidinone derivatives dissolved in water.

PRINCIPLE⁸⁷

α -amylase digests the starch in reaction mixture to yield maltose. The maltose produced would reduce the 3, 5-dinitrosalicylic acid in the coloring agent to 3 amino 5- nitrosalicylic acid. The reaction mixture produced a colour change from orange to red. The intensity of red colour will be directly proportional to the amount of maltose produced. When an enzyme inhibitor is present in reaction mixture digestion of starch, production of maltose and intensity of red colour produced will be less.

PREPARATION OF REAGENTS⁸⁸⁻⁸⁹

Preparation of Phosphate Buffer

Phosphate buffer (20 mM) of pH 6.9 (prepared with sodium phosphate monobasic and sodium chloride)

Preparation of Starch Solution

Starch solution (1.0%) prepared with phosphate buffer by boiling.

Preparation of Coloring Reagents

Colouring reagent is prepared by slowly adding sodium potassium tartarate solution [prepared in the ratio 12 g of solid dissolved in 8 ml of 2M sodium hydroxide] to 20 ml of 96 mM 3,5-dinitrosalicylic acid (prepared in



distilled water) and then diluting the mixture to 40 ml with distilled water.

Preparation of enzyme solution

Enzyme solution, alpha amylase (0.5 mg/ml) prepared with phosphate buffer pH 6.9.
90-92

PROCEDURE

From 1 mg/ml stock solution different concentration (5-500 µg/ml) of 4- thiazolidinone derivatives were prepared by adding few drops of dimethyl sulfoxide and volume made up with water. About 500 µl of α-amylase (0.5 mg/ml) was added and was incubated for 10 minutes at room temperature. Then added 500µl of 1.0% starch solution and incubated for another 10 minutes. After that 1 ml of the coloring reagent was added to the reaction mixture and heated in a boiling water bath for 5 minutes. After cooling, 10 ml of distilled water was added for dilution. To measure the absorbance of the colored extracts, blank was prepared for each set of concentration of test sample by replacing the enzyme solution with buffer. Control incubations representing 100% enzyme activity was prepared by replacing the test drug with water. The absorbance was then measured at 520 nm. The α-amylase inhibition was expressed as percentage of inhibition and the IC₅₀ values determined by linear regression plots with varying concentration of synthesized thiazolidinone against percentage inhibition.

CALCULATION OF PERCENTAGE OF INHIBITION

$$\text{PERCENTAGE INHIBITION} = \frac{C-T}{C} \times 100$$

Statistical Analysis

All values are expressed as mean ± SEM. Data were analyzed by non-parametric ANOVA followed by Dunnett's multiple comparison tests, and other data was evaluated using Graph Pad PRISM software. A *p*-value < 0.05 was considered significantly different.

RESULTS AND DISCUSSION

Chemical work

The results of the present work are discussed under the following heads.

Scheme: 2-(4-substituted phenyl)-3-(4, 6-dimethylpyrimidin-2-yl) thiazolidin-4-one (**T1- T5**).

Synthesis of 2-(4-substituted phenyl)-3-(4,6-dimethylpyrimidin-2-yl)thiazolidin-4- one.

Synthetic route depicted in scheme outline the chemistry part of the present work. 2-(4-substituted phenyl)-3-(4, 6-dimethylpyrimidin-2-yl)thiazolidin-4-one (**T1-T5**) were obtained by the condensation of dimethylpyrimidin-2-ylamine and various substituted aldehydes were stirred in THF, followed by the addition of mercaptoacetic acid and DCC. The formation of the substituted 4-thiazolidinones were confirmed by the presence of characteristic peaks in the IR spectra. It showed characteristic peaks at around 3400 cm⁻¹ for NH₂ stretching and peak around 2900 cm⁻¹ due to the presence of N=CH stretching. The NMR spectrum of the compounds (**T1-T5**) showed the characteristic peak around δ 2.70 ppm for CH₃ group, δ 3.00 ppm for CH₂ and δ 5.70 ppm for NCH and also shows multiplet in the range of δ 6.80-8.30 ppm owing to aromatic protons. The appearance of peak due to chlorine in IR spectra around 700 -800 cm⁻¹ and formation M+2 peak in the mass spectra. Data from the elemental analyses and molecular ion recorded in the mass spectra further confirmed the assigned structure.

Pharmacological Investigation

Evaluation of α-amylase inhibitory activity

All the newly synthesized compounds were screened for *in vitro* α-amylase inhibitory activity at 5, 10, 25, 50, 100, 200, 400, 500µg/ml concentration. Acarbose was used as a standard drug in the same concentration. A graded increase in the percentage of inhibition was observed with increase in concentration.

The synthesized compounds in which IC₅₀ of compound-T1 (25 µg/ml) and other 4 compounds in which IC₅₀ of compounds-T₂ (35 µg/ml) and T₅(30µg/ml) showed percentage of inhibition closer to that of standard(Acarbose-12 µg/ml). The IC₅₀ values of synthesized compounds were found by plotting a graph of percentage inhibition versus concentration in µg/ml. The values were compared with that of standard.

Among the synthesized compounds, T1 and T5 showed good percentage of inhibition at all concentration (5 µg/ml-500 µg). The IC₅₀ values for these compounds were found to be 25 µg/ml and 30 µg/ml respectively which are close to IC₅₀ value of acarbose (10 µg/ml). T3 and T4 showed moderate α-amylase inhibitory activity at all concentrations. The IC₅₀ value for these compounds found to be 59 µg/ml and 110 µg/ml respectively.



T1 (*p*-chlorophenyl) produced IC₅₀ value (25 µg/ml) which is relatively less value of IC₅₀ indicates the sample has better α-amylase inhibitory activity which has significant α-amylase inhibitory activity when compared to that standard.

T2 (dimethylamino group) produced IC₅₀ value (35 µg/ml) which is relatively less value of IC₅₀ indicates the sample has more α-amylase inhibitory activity which has significant α-amylase inhibitory activity when compared to that standard.

T3 (dimethylamino cinnamaldehyde group) produced IC₅₀ value (110 µg/ml) which is least value of IC₅₀ indicates the sample has less α-amylase inhibitory activity when compared to that standard. T4 (*p*-hydroxyl group) produced IC₅₀ value (59 µg/ml) which is least value of IC₅₀ indicates the sample has less α-amylase inhibitory activity when compared to that standard. T5 (*p*-amino group) produced IC₅₀ value (30 µg/ml) which is relatively less value of IC₅₀ indicates the sample has more α-amylase inhibitory activity when compared to that standard. The best mean IC₅₀ values were achieved with compound (T1, T2, and T5) with slight difference among them.

Among the test compounds, compound 2-(4-chlorophenyl)-3-(4, 6-dimethylpyrimidin-2-yl)thiazolidin-4-one (T1) was found to be the most active agent which showed 88.00 µg/ml α-amylase inhibition in the highest concentration, which have *p*-chloro phenyl group in the 4-thiazolidinone nucleus.

PERCENTAGE OF α-AMYLASE INHIBITORY POTENTIAL OF SYNTHESISED COMPOUNDS IN VITRO α-AMYLASE INHIBITORY ACTIVITY

Compound code	5 µg/ml	10 µg/ml	25 µg/ml	50 µg/ml	100 µg/ml	200 µg/ml	400 µg/ml	500 µg/ml	IC ₅₀ µg/ml
T1	33.75	41.25	54.50	60.41	65.00	75.00	85.00	88.00	25
T2	29.16	40.46	44.83	49.25	64.16	67.33	78.75	81.58	35
T3	19.16	28.83	42.79	42.75	49.85	58.75	73.58	79.00	110
T4	24.54	30.58	35.75	42.16	57.67	60.46	71.16	79.06	59
T5	30.69	35.47	46.81	56.25	68.75	77.50	80.16	85.40	30

CONCLUSION

In summary, a new series of 2-(4-substituted phenyl)-3-(4, 6-dimethylpyrimidin-2-yl) thiazolidin-4-one (T1-T5) were synthesized. These title compounds containing five different substituent's at C-4 position were screened for their α-amylase inhibitory activity. Most of the test compounds were found to exhibit significant α-amylase inhibitory activity in the lowest concentration. Among the substituent's at C-4, *p*-chloro phenyl substituent shows maximum α-amylase enzyme inhibitory potency, while 4-aminophenyl and 4-dimethylaminophenyl substituent showed equipotent or has little less α-amylase inhibitory activity when compared to compound T1, but the dimethylamino cinnamaldehyde and 4-hydroxy phenyl substituent exhibited least α-amylase inhibitory activity when compare to other substituents. The order of activity at C-4 is *p*-chloro phenyl ≥ *p*-amino phenyl ≥ *p*-dimethylaminophenyl ≥ 4-hydroxyl phenyl ≥ *p*-dimethylamino cinnamaldehyde substituents.

Among the test compounds, compound 2-(4-chlorophenyl)-3-(4, 6-dimethylpyrimidin-2-yl)thiazolidin-4-one (T1) was found to be the most active agent which showed 88.00 µg/ml α-amylase inhibition in the highest concentration, which have *p*-chloro group in the thiazolidinone nucleus.

Hence this molecule can be selected as a lead molecule of the present study for further exploitation.

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