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SYNTHESIS OF SOME PHENYLPYRAZOLO BENZOTHIAZOLO QUINOXALINE DERIVATIVES

Ch.Sridevi*, K.Balaji[1], A.Naidu[2], S.Kavimani[3], D.Venkappayya[4] R.Suthakaran[5] and Sudha parimala[6]

***[1]Dept. of Pharmaceutical Chemistry, Geethanjali college of pharmacy, Hyderabad.**
[2]Dept. of Chemistry, J.N.T.University, Hyderabad, India.
[3]Dept. of Pharmacology, Mother Terasa Institute of Health sciences (Pharmacy), Puducherry, India.
[4]Dept. of Chemistry and Biotechnology, SASTRA University, Tanjoor, (T.N), India.
[5]Dept. of pharmaceutical chemistry, S.S.R College of pharmacy, Mahabubnagar (A.P), India.
[6]Dept. of pharmaceutical chemistry, Reddys women's college, Hyderabad, India.

Email:sudha_sudhar@rediffmail.com

Abstract: 2,3-Diphenyl quinoxalin **(SI)** is fused with 2-amino benzothiazoles **(SII)** by a methylene bridge, which is then allowed for acetylation. The acetylated product **(SIV)** is made to react with different aromatic aldehydes to give chalcones **(SV 1-SV 5**). Chalcones refluxed with substituted acid hydrazides to afford different phenyl pyrazolo benzothiazolo quinoxaline derivatives **(SVI 1-SVI 15).** The structure of chalcones and phenyl pyrazolo benzothiazolo quinoxaline derivatives were confirmed by M.P, TLC and Spectral data. All the synthesized compounds were screened for their antioxidant, anti-inflammatory and antihistamic activities. For antioxidant studies DPPH method was followed using Ascorbic acid as standard drug. Among 15 compounds, SVI3 (90%), SVI8 (91%), SVI13 (92%), SVI14 (91.8%), SVI15 (92%) have shown good free radical scavenging activity. For anti-inflammatory activity Carrageenan induced rat hind paw edema method is followed using Ibuprofen as standard drug. Compounds SVI 13 (91.89%) and, SVI 14 (90.49) % were showed good inhibition of edema volume. Antihistaminic activity was screened following histamine chamber method. Compounds SVI 10, SVI 4, SVI 3 were shown good % protection of antihistamic activity i.e., 91.9%, 93.7%, 92.4% respectively.
Key words: **PHENYLPYRAZOLO BENZOTHIAZOLO QUINOXALINE DERIVATIVES.**

Introduction

Benzothiazole moiety plays an important role in heterocyclic chemistry largely due to its wide range of biological activities[1, 2, 3, 4] such as antimicrobial antitubercular, anti-inflammatory, anticancer etc., Quinoxaline derivatives have been reported to possess a wide variety of biological activities[5, 6, 7] . Notable among these are antioxidant, anti-inflammatory antimicrobial, anticancer and antihistamic activities. Drugs having pyrazoline ring system[8, 9, 10] are well known for their anti-inflammatory, antioxidant, antihistamic, antimicrobial, antidepressant, hypoglycemic, hypotensive, anticarcenogenic activities etc. In view of the above facts, it was contemplated to design and synthesize some phenyl pyrazolo benzothiazolo quinoxaline derivatives by condensing benzothiazolo quinoxaline chalcones with different aromatic acid hydrazides. All the synthesized compounds were screened for their antioxidant, anti-inflammatory and antihistamic activities. The structure of chalcones and phenyl pyrazolo benzothiazolo quinoxaline derivatives were confirmed by M.P, TLC, and Spectral data.

Antiinflammatory activity [15, 16]

All the compounds screened for antioxidant studies following DPPH method. Ascorbic acid is used as standard drug. Among 15 compounds, SVI3 (90%), SVI8 (91%), SVI13 (92%), SVI14 (91.8%), SVI15 (92%) have shown good free radical scavenging activity.

For antiinflammatory activity Carrageenan induced rat hind paw edema method is followed using Ibuprofen as standard drug. Compounds SVI 13 (91.89%) and, SVI 14 (90.49) % were showed good inhibition of edema volume.

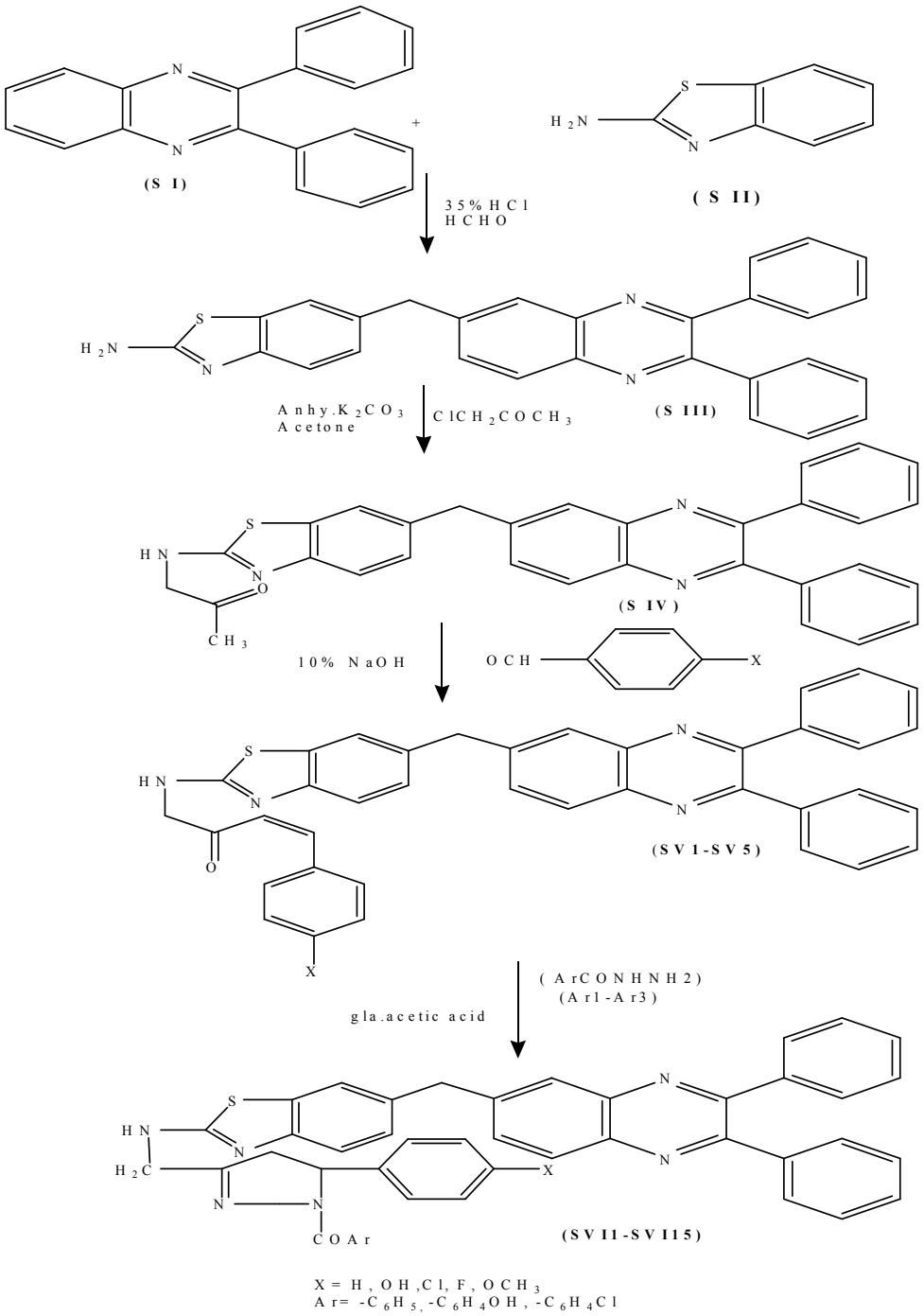
Antihistaminic activity[17]

Antihistaminic activity was screened following histamine chamber method. Compounds SVI 10, SVI 4, SVI 3 were shown good % protection of antihistamic activity i.e., 91.9%, 93.7%, 92.4% respectively.

Experimental

The melting point of the compounds were determined on a Thoshniwal electric melting point apparatus and the values were uncorrected. I.R spectrs of the compounds were recorded on a Thermo Nicolet Nexus670-FTIR, IICT, Hyderabad using KBr disc method. 1H NMR spectra were recorded onAvance-300, IICT, Hyderabad using $CDCl_3$ as solvent. Mass spectra were recorded on HITACHI RMU GL, IICT, Hyderabad. All the solvents used were of analytical grade.

SCHEME



6-((2,3-diphenylquinoxalin-6-yl)methyl)benzo[d]thiazol-2-amine SIII [11]

General procedure

2,3 Diphenyl Quinoxalin (**SI**) and 2-aminobenzothiazole (**SII**) were prepared following the literature method. **SI** and **SII** are linked with a methelyne bridge by treating equimolar quantities of **SI** and **SII** in suitable solvent with 35 parts formaldehyde solution and 35% HCl, stirring for 4 hr. at 70°C using magnetic stirrer. Solution was made alkaline using ammonia solution. Filtered the product and recrystallized with aq.ethanol.

Yield: 70%, m.p: 106°C, IR (KBr) in cm^{-1}: 746 (C-S str.), 1665 (C=N str.), 1340 (C-N str.), 3085 (Ar-H str.), 3359, 3500 (C-NH_2 str.).^{1}HNMR ($CDCl_3$) δ: 3.9 (S, 2H, ArC-NH), 3.81 (S, 2H, methylene), 7.5-7.9 (m, 3H, quinoxaline), 7.2-7.4 (m, 10H, Ar-H), 7.3-8.1 (m, 3H, benzothiazole). Mass: m/z: 444.5 (M+): [Found: C, 75.6, H, 4.5, N, 12.6, S, 7.19 $C_{28}H_{20}N_4S$ requires C, 75.65, H, 4.53, N, 12.6, S, 7.21%].

1-(6-((2,3-diphenylquinoxalin-6-yl)methyl)benzo[d]thiazol-2-ylamino)propan-2-one SIV [12]

General procedure

A solution of **SIII** (0.01M) and chloroacetone (0.01M) were taken into 250ml round bottom flask. Added to it 150ml of dry acetone and 30g of anhyd. Potassium carbonate and the reaction mixture were refluxed for 6hr. below 75°C. Filterate obtained was concentrated under vaccum and recrystallized with aq.ethanol.

Yield: 66%, m.p: 122-125°C, IR (KBr) cm^{-1}: 744 (C-S str.), 1793 (C=O str.), 1668 (C=N str.), 1340 (C-N str.), 3085 (Ar-H str.), 3323 (C-H str).^{1}HNMR ($CDCl_3$) δ: 2.09 (S, 3H, methyl), 3.8,4.2 (S, 4H, methylene), 4.0 (S, 2H, ArC-NH), 7.4-7.9 (m, 3H, quinoxaline), 7.14-7.4 (m, 10H,Ar-H), 7.31-8.1 (m, 3H, benzothiazole). Mass: m/z: 500.1 (M+). [Found C, 74.3, H, 4.8, N, 11.1, O, 3.2, S, 6.4 $C_{31}H_{24}N_4OS$ requires C, 74.38, H, 4.83, N, 11.19, O, 3.2, S, 6.41%].

(Z)-1-(6-((2,3-Diphenylquinoxalin-6-yl) methyl) benzo [d] thiazol-2-ylamino)-4-phenylbut-3-en-2-one SV1-SV5[13]

General procedure

Method of aldol condensation followed. A solution of NaOH / KOH (8ml, 10% in water) was added drop wise to a well-stirred solution of S IV (0.01M) and (0.01M) of appropriate aldehyde in 20ml ethanol. The reaction mixture was stirred for 24hr. at cold conditions. Then diluted with ice water and acidified with Con.Hcl. Filtered the product and recrystallized with aq.ethanol. The purity of the compound was checked by TLC and melting point.

SV 1: Yield: 73%, m.p: 110°C, IR (KBr) cm^{-1}: 745 (C-S str.), 1773 (C=O str.), 1668(C=N str.), 1340 (C-N str.), 3085 (Ar-H str.), 3323 (C-H str.) Cm^{-1}.^{1}HNMR ($CDCl_3$) δ: 4.7,3.8 (S, 4H, methylene), 4.1 (S, 1H, ArC-NH), 6.2,7.3(d, 2H,ethylene), 7.5-7.9(m, 3H, quinoxaline), 7.2-7.4 (m, 15H, Ar-H), 7.9-8.1 (m, 3H, benzothiazole). Mass: m/z: 588.7 (M+) [Found C, 77.3, H, 4.6, N, 9.5, O, 2.7, S, 5.4. $C_{38}H_{28}N_4OS$ requires C, 77.53, H, 4.79, N, 9.52, O, 2.72, S, 5.45%].

Synthesis of (3-(6-((2,3diphenylquinoxalin-6yl) methyl) benzo [d] thiazol-2-yl ami- no) methyl)-4,5-dihydro-5-phenylpyrazol-1-yl)(phenyl) methanone SVI1– SVI15[14]

General procedure

Chalcone (0.01M) and aromatic acidhydrazide (0.02M) were taken in 20ml glacial acetic acid and refluxed for 10hr. above 130°c. The reaction mixture was concentrated and poured in 300ml of ice-cold water and recrystallized with aq.ethanol. The purity of the compound was checked by TLC and melting point. Physical data are shown in Table-1

SVI1: Yield: 60%, m.p: 122 °C, IR (KBr) cm^{-1}: 745 (C-S str.), 1790 (C=O str.), 1668 (C=N str.), 1339 (C-N str.), 3035 (Ar-H str.), 3320 (C-H str.) Cm^{-1}. ^{1}HNMR ($CDCl_3$): 1.79, 2.0 (m, 2H, methylene), 3.1, 3.8 (S, 4H, methylene), 4.0 (S, 1H, ArC-NH), 4.9 (m, 1H, methine), 7.5-7.9 (m, 3H, quinoxaline), 6.6-7.4 (m, 20H, Ar-H), 7.9-8.1 (m, 3H, benzothiazole). Mass: m/z: 706.2 (M+) [Found C, 76.0, H, 4.8, N, 11.8, O, 2.2, S, 4.5. $C_{45}H_{34}N_6OS$ requires C, 76.46, H, 4.85, N, 11.89, O, 2.26, S, 4.54%]

SVI2: Yield: 64%, m.p: 115 °C, IR (KBr) cm^{-1} :3750 (O-H str.) 743 (C-S str.), 1777 (C=O str.), 1664 (C=N str.), 1340 (C-N str.), 3035 (Ar-H str.), 3320 (C-H str.) Cm^{-1}.^{1}HNMR ($CDCl_3$): 1.8,2.0 (m, 2H, methylene), 3.1,3.8(S, 4H, methylene), 4.0 (S, 1H, ArC-NH), 4.9 (m, 1H, methine), 5.0 (S, 1H, Ar-OH), 7.5-7.9 (m, 3H, quinoxaline), 6.6-7.4 (m, 19H, Ar-H), 7.9-8.1 (m, 3H, benzothiazole). Mass: m/z: 722.2 (M+) [Found C, 73.7, H, 4.77, N, 11.4, O, 4.4, S, 4.3. $C_{45}H_{34}N_6O_2S$ requires C, 74.77, H, 4.74, N, 11.63, O, 4.43, S, 4.44%]

SVI3: Yield: 71%, m.p: 116-118 °C, IR (KBr) cm^{-1}: 1010 (C-F), 743 (C-S str.), 1777 (C=O str.), 1664(C=N str.), 1340 (C-N str.), 3035 (Ar-H str.), 3320 (C-H str.) Cm^{-1}.^{1}HNMR ($CDCl_3$): 1.8,2.0 (m, 2H, methylene), 3.1,3.8 (S, 4H, methylene), 3.9 (S, 1H, ArC-NH), 4.9 (m, 1H, methine), 7.5-7.9(m, 3H, quinoxaline), 6.9-7.9 (m, 19H,Ar-H), 7.3-8.1 (m, 3H, benzothiazole). Mass: m/z: 724.2 (M+) [Found C, 74.5, H, 4.59, F, 2.6, N, 11.0, O, 2.2, S, 4.3. $C_{45}H_{33}FN_6OS$ requires C, 74.56, H, 4.59, F, 2.6, N, 11.59, O, 2.21, S, 4.42%]

SVI 4: Yield: 70%, m.p: 114 °C, IR (KBr) cm^{-1}: 750.3 (C-Cl), 743(C-S str.), 1778 (C=O str.), 1664 (C=N str.), 1340(C-N str.), 3035(Ar-H str.), 3322 (C-H str.) Cm^{-1}.^{1}HNMR ($CDCl_3$): 1.7,2.0 (m, 2H, methylene), 3.1,3.8(S, 4H, methylene), 4.0 (S, 1H, ArC-NH), 4.9 (m, 1H, methine), 7.5-7.9 (m, 3H, quinoxaline), 7.0-7.4(m, 19H, Ar-H), 7.3-8.1 (m, 3H, benzothiazole). Mass: m/z: 740.2 (M+) [Found C, 72.9, H, 4.39, Cl, 4.78, N, 11.3, O, 2.16, S, 4.3. $C_{45}H_{33}ClN_6OS$ requires C, 72.91, H, 4.49, Cl, 4.78, N, 11.34, O, 2.16, S, 4.33%]

SVI5: Yield: 50%, m.p: 114 ^{o}C, IR (KBr) cm^{-1}: 745(C-S str.), 1770 (C=O str.), 1666 (C=N str.), 1340 (C-N str.), 3037 (Ar-H str.), 3325 (C-H str.) Cm^{-1}. ^{1}HNMR ($CDCl_3$): 1.8,2.0 (m, 2H, methylene), 3.1,3.8 (S, 4H, methylene), 3.73 (S, 3H, methoxy), 4.1 (S, 1H, ArC-NH), 4.9 (m, 1H, methine), 7.5-7.9 (m, 3H, quinoxaline), 6.7-7.9 (m, 19H, Ar-H), 7.3-8.1 (m, 3H, benzothiazole). Mass: m/z: 736.2 (M+) [Found C, 74.5, H, 4.9, N, 11.0, O, 4.3, S, 4.3. $C_{46}H_{36}N_6O_2S$ requires C, 74.98, H, 4.92, N, 11.4, O, 4.34, S, 4.35%].

SVI 6: Yield: 63%, m.p: 109-110 ^{o}C, IR (KBr) cm^{-1}: 3750 (O-H str.) 745 (C-S str.), 1770 (C=O str.), 1666 (C=N str.), 1340(C-N str.), 3037(Ar-H str.), 3325(C-H str.) Cm^{-1}. ^{1}HNMR ($CDCl_3$): 1.7,2.0 (m, 2H, methylene), 3.1,3.8(S, 4H, methylene), 4.1 (S, 1H, ArC-NH), 4.9 (m, 1H, methine), 5.0 (S, 1H,Ar-OH), 7.5-7.9(m, 3H, quinoxaline), 6.7-7.7 (m, 19H, Ar-H), 7.3-8.1 (m, 3H, benzothiazole). Mass: m/z: 722.2 (M+) [Found C, 74.5, H, 4.6, N, 11.2, O, 4.3, S, 4.3. $C_{45}H_{34}N_6O_2S$ requires C, 74.77, H, 4.74, N, 11.63, O, 4.43, S, 4.44%]

SVI7: Yield: 60%, m.p: 120 ^{o}C, IR (KBr) cm^{-1}: 3758 (O-H str.) 745 (C-S str.), 1770 (C=O str.), 1666 (C=N str.), 1337 (C-N str.), 3037 (Ar-H str.), 3325 (C-H str.) Cm^{-1}. ^{1}HNMR ($CDCl_3$): 1.8,2.0 (m, 2H, methylene), 3.1,3.8(S, 4H, methylene), 4.0 (S, 1H, ArC-NH), 4.9 (m, 1H, methine), 5.0 (S, 2H, Ar-OH), 7.5-7.9(m, 3H, quinoxaline), 6.7-7.7(m, 18H,Ar-H), 7.3-8.1 (m, 3H, benzothiazole). Mass: m/z: 738.2 (M+) [Found C, 73.0, H, 4.6, N, 11.2, O, 6.4, S, 4.3. $C_{45}H_{34}N_6O_3S$ requires C, 73.15, H, 4.64, N, 11.37, O, 6.5, S, 4.34%]

SVI 8: Yield: 67%, m.p: 112-115 ^{o}C, IR (KBr) cm^{-1}: 1012 (C-F), 3758 (O-H str.) 747 (C-S str.), 1769 (C=O str.), 1662 (C=N str.), 1334 (C-N str.), 3037(Ar-H str.), 3325(C-H str.) Cm^{-1}. ^{1}HNMR ($CDCl_3$): 1.8,2.0 (m, 2H, methylene), 3.1,3.8 (S, 4H, methylene), 4.1 (S, 1H, ArC-NH), 4.9 (m, 1H, methine), 5.0 (S, 1H, Ar-OH), 7.5-7.9 (m, 3H, quinoxaline), 6.9-7.7 (m, 18H, Ar-H), 7.3-8.1 (m, 3H,benzothiazole). Mass: m/z: 740.2 (M+) [Found C, 72.0, H, 4.39, F, 2.5, N, 11.2, O, 4.3, S, 4.3. $C_{45}H_{33}FN_6O_2S$ requires C, 72.95, H, 4.49, F, 2.56, N, 11.34, O, 4.32, S, 4.33%]

SVI 9: Yield 67%, m.p: 108-110 ^{o}C, IR (KBr) cm^{-1}: 750 (C-Cl), 3758 (O-H str.) 745 (C-S str.), 1770 (C=O str.), 1666 (C=N str.), 1337 (C-N str.), 3030 (Ar-H str.), 3325 (C-H str.) Cm^{-1}. ^{1}HNMR ($CDCl_3$): 1.8,2.0 (m, 2H, methylene), 3.1,3.8 (S, 4H, methylene), 3.9 (S, 1H, ArC-NH), 4.9 (m, 1H, methine), 5.0(S, 1H, Ar-OH), 7.5-7.9(m, 3H, quinoxaline), 6.9-7.7 (m, 18H, Ar-H), 7.3-8.1 (m, 3H, benzothiazole).). Mass: m/z: 756.2 (M+) [Found C, 71.0, H, 4.2, Cl, 4.6, N, 11.0, O, 4.1, S, 4.2. $C_{45}H_{33}ClN_6O_2S$ requires C, 71.37, H, 4.39, Cl, 4.68, N, 11.10, O, 4.23, S, 4.23%]

SVI10: Yield: 59%, m.p: 110-111 ^{o}C, IR (KBr) cm^{-1}: 3750 (O-H str.), 745 (C-S str.), 1775 (C=O str.), 1660 (C=N str.), 1335 (C-N str.), 3037 (Ar-H str.), 3325 (C-H str.) Cm^{-1}. ^{1}HNMR ($CDCl_3$): 1.8,2.0 (m, 2H, methylene), 3.1,3.8(S, 4H, methylene), 3.73(S, 3H, methoxy), 4.0 (S, 1H, ArC-NH), 4.9 (m, 1H, methine), 5.0 (S, 1H, Ar-OH), 7.5-7.9 (m, 3H, quinoxaline), 6.9-7.7 (m, 18H, Ar-H), 7.3-8.1 (m, 3H, benzothiazole). Mass: m/z: 752.2 (M+) [Found C, 72.0, H, 4.79, N, 11.0, O, 6.24, S, 4.2. $C_{46}H_{36}N_6O_3S$ requires C, 73.38, H, 4.82, N, 11.16, O, 6.38, S, 4.26%]

SVI11: Yield: 69%, m.p: 110-112 ^{o}C, IR (KBr) cm^{-1}: 753 (C-Cl), 745 (C-S str.), 1770 (C=O str.), 1660 (C=N str.), 1335(C-N str.), 3037 (Ar-H str.), 3325 (C-H str.) Cm^{-1}. ^{1}HNMR ($CDCl_3$): 1.7, 2.0 (m, 2H, methylene), 3.1, 3.8 (S, 4H, methylene), 4.1 (S, 1H, ArC-NH), 4.9 (m, 1H, methine), 7.5-7.9 (m, 3H, quinoxaline), 7.0-7.7 (m, 19H, Ar-H), 7.3-8.1 (m, 3H, benzothiazole). Mass: m/z: 740.2 (M+) [Found C, 72.0, H, 4.0, Cl, 4.72, N, 11.0, O, 2.1, S, 4.2. $C_{45}H_{33}ClN_6OS$ requires C, 72.91, H, 4.49, Cl, 4.78, N, 11.34, O, 2.16, S, 4.33%]

SVI12: Yield: 69%, m.p: 120-122 ^{o}C, IR (KBr) cm^{-1}: 750 (C-Cl), 3758 (O-H str.), 745 (C-S str.), 1770 (C=O str.), 1660 (C=N str.), 1335 (C-N str.), 3037 (Ar-H str.), 3325 (C-H str.) Cm^{-1}. ^{1}HNMR ($CDCl_3$): 1.8,2.0 (m, 2H, methylene), 3.1,3.8 (S, 4H, methylene), 4.0 (S, 1H, ArC-NH), 4.9 (m, 1H,methine), 5.0(S, 1H, Ar-OH), 7.5-7.9 (m, 3H, quinoxaline), 6.6-7.7 (m, 18H, Ar-H), 7.3-8.1 (m, 3H, benzothiazole). Mass: m/z: 756.2 (M+) [Found C, 71.0, H, 4.2, Cl, 4.6, N, 11.0, O, 4.1, S, 4.2. $C_{45}H_{33}ClN_6O_2S$ requires C, 71.37, H, 4.39, Cl, 4.68, N, 11.10, O, 4.23, S, 4.23%].

SVI13: Yield: 69%, m.p: 120-122 ^{o}C, IR (KBr) cm^{-1}: 1010 (C-F), 754 (C-Cl), 745 (C-S str.), 1769 (C=O str.), 1660 (C=N str.), 1335 (C-N str.), 3037 (Ar-H str.), 3325 (C-H str.) Cm^{-1}. ^{1}HNMR ($CDCl_3$): 1.7,2.0 (m, 2H, methylene), 3.1,3.8 (S, 4H, methylene), 4.1 (S, 1H, ArC-NH), 4.9 (m, 1H, methine), 7.5-7.9 (m, 3H, quinoxaline), 6.9-7.8 (m, 18H, Ar-H), 7.3-8.1 (m, 3H, benzothiazole). Mass: m/z: 758.2 (M+) [Found C, 71.0, H, 4.1, Cl, 4.5, F, 2.5, N, 11.0, O, 2.0, S, 4.1. $C_{45}H_{32}ClFN_6OS$ requires C, 71.18, H, 4.25, Cl, F, 2.5, 4.67, N, 11.07, O, 2.11, S, 4.22%]

SVI 14: Yield: 59%, m.p: 130-132 ^{o}C, IR (KBr) cm^{-1}: 750 (C-Cl), 745 (C-S str.), 1770 (C=O str.), 1660 (C=N str.), 1335 (C-N str.), 3037 (Ar-H str.), 3325 (C-H str.) Cm^{-1}. ^{1}HNMR ($CDCl_3$): 1.8,2.0 (m, 2H, methylene), 3.1,3.8 (S, 4H,methylene), 4.2 (S, 1H,ArC-NH), 4.9 (m, 1H, methine), 7.5-7.9 (m, 3H, quinoxaline), 7.0-7.8 (m, 18H, Ar-H), 7.3-8.1 (m, 3H, benzothiazole). Mass: m/z: 774.1 (M+) [Found C, 69.0, H, 4.1, Cl, 9.0, N, 10.8, O, 2.0, S, 4.1. $C_{45}H_{32}Cl_2N_6OS$ requires C, 69.67, H, 4.16, Cl, 9.14, N, 10.83, O, 2.06, S, 4.13%]

SVI15: Yield: 58%, m.p: 122-124 ^{o}C, IR (KBr) cm^{-1}: 755 (C-Cl), 747 (C-S str.), 1768 (C=O str.), 1660 (C=N str.), 1332 (C-N str.), 3037 (Ar-H str.), 3325 (C-H str.) Cm^{-1}. ^{1}HNMR ($CDCl_3$): 1.8,2.0 (m, 2H, methylene), 3.1,3.8 (S, 4H, methylene), 3.73 (S, 3H,methoxy), 4.0 (S, 1H, ArC-NH), 4.9 (m, 1H, methine), 7.5-7.9 (m, 3H, quinoxaline), 6.7-7.8 (m, 18H, Ar-H), 7.2-8.0 (m, 3H, benzothiazole). Mass: m/z: 770.2 (M+) [Found C, 71.0, H, 4.5, Cl, 4.5, N, 10.0, O, 4.10, S, 4.1. $C_{46}H_{35}ClN_6O_2S$ requires C, 71.63, H, 4.57, Cl, 4.60, N, 10.9, O, 4.15, S, 4.16%].

Results and discussion:

Synthesis of some phenyl pyrazolo benzothiazolo quinoxaline derivatives was done by condensing benzothiazolo quinoxaline chalcones with different aromatic acid hydrazides. All the synthesized compounds were screened for their antioxidant, anti-inflammatory and antihistamic activities. For antioxidant studies DPPH method was followed using Ascorbic acid as standard drug. Among 15 compounds, SVI3 (90%), SVI8 (91%), SVI13 (92%), SVI14 (91.8%), SVI15 (92%) have shown good free radical scavenging activity. For anti-inflammatory activity Carrageenan induced rat hind paw edema method is followed using Ibuprofen as standard drug. Compounds SVI 13 (91.89%) and, SVI 14 (90.49) % were showed good inhibition of edema volume. Antihistaminic activity was screened following histamine chamber method. Compounds SVI 10, SVI 4, SVI 3 were shown good % protection of antihistamic activity i.e., 91.9%, 93.7%, 92.4% respectively

Acknowledgements

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Table – 1: Physical data of benzothiazolyl 2,3diphenyl quinoxaline pyrazoline derivatives

Compd.	X	Ar	Molecular Formula	Melting point range (°C)	% Yield	R_f value
SVI1	H	C_6H_5	$C_{45}H_{34}N_6OS$	120-122	70	0.89
SVI2	OH	C_6H_5	$C_{45}H_{34}N_6O_2S$	115-116	67	0.8
SVI3	F	C_6H_5	$C_{45}H_{33}FN_6OS$	114-116	66	0.87
SVI4	Cl	C_6H_5	$C_{45}H_{33}ClN_6OS$	112-113	78	0.9
SVI5	OCH_3	C_6H_5	$C_{46}H_{36}N_6O_2S$	114-116	67	0.86
SVI6	H	OHC_6H_4	$C_{45}H_{34}N_6O_2S$	120-124	66	0.91
SVI7	OH	OHC_6H_4	$C_{45}H_{34}N_6O_3S$	119-120	80	0.93
SVI8	F	OHC_6H_4	$C_{45}H_{33}FN_6O_2S$	108-110	45	0.9
SVI9	Cl	OHC_6H_4	$C_{45}H_{33}ClN_6O_2S$	112-115	45	0.8
SVI10	OCH_3	OHC_6H_4	$C_{45}H_{36}N_6O_3S$	110-112	67	0.89
SVI11	H	ClC_6H_4	$C_{45}H_{33}ClN_6OS$	110-112	56	0.88
SVI12	OH	ClC_6H_4	$C_{45}H_{33}ClN_6O_2S$	120-122	78	0.82
SVI13	F	ClC_6H_4	$C_{45}H_{32}ClFN_6OS$	130-131	76	0.79
SVI14	Cl	ClC_6H_4	$C_{45}H_{32}Cl_2N_6OS$	120-124	56	0.98
SVI15	OCH_3	ClC_6H_4	$C_{46}H_{35}ClN_6O_2S$	123-126	54	0.8

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