A Review Literature on Synthesis of some Triazole Derivatives, Their Biological Characterization in Pharmaceutical Field

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Abstract

In a last century , a large number of different molecules of hetero cyclic compound have been synthesis i.e. quinazolinone thiazolinone azetidinone etc. but in it triazole derivatives show great attraction towards in heterocyclic compound and triazole molecules show very important part due to its efficacy against biological and pharmaceutical field and its molecules generally found in two isomeric form1,2,3 and 1,2,4 triazole moiety derivatives , and these isomeric form of derivatives is very important in biological and pharmaceutical field i.e. microbial, fungal, tubercular cancer, bacterial etc .

Keyword

Triazole moiety, pharmaceutical, biological activity, fungal activity and microbial activity.

Introduction

Heterocyclic chemistry is a wide area of chemistry in it one or more ring with hetero atom present ,which is other than carbon atom present in it , hetero atom which general form the ring is S , N , halogen , oxygen ,triazole unit containing derivatives antifungal drug i.e. Fluconazole, Isovucanazole, Itraconazole,Voriconazole,Pramiconazole,Ravuconazole And Posaconazole.Two isomeric form of triazole unit

A B

Fig 1 1, 2, 3 and1, 2, 4 Triazole tautomeric form

Different molecules of triazole show very effective and useful nature –i.e. substituted azetidinyl indole triazole characterised as antibacterial properties [1.] novel1,2,4 triazole containing quinazolinyl pipridinyl and N (substituted phenyl) acetamide work as antibacterial and phyto phathogenic bacterium orazae pv [4] and· Work in the field of corrosion inhibitor for carbon steel [5] triazole nucleus are also very effective in anticancer protective molecules [10] triazole compound in hetro cyclic chemistry containing triazole as well as amide unit is very effective as anti fungal characteristic [11] triazole nucleus function as biological and pharmaceutical properties in different disease [14] properties show as anticancer activity [16] bistriazole show properties as cytotoxicity nature [18] antifungal , antibacterial properties of novel 1,2,3 triazole [19] aryl sulphonamide triazale derivatives show activity and valuable properties as anti tubercular activity [22]unit of triazole function as anti proliferative activity [24] in biological field triazole molecules and nucleus also function as anti fungal and anti tubercular nature and function against different properties .so we notify characterized triazole derivatives (nucleus) is very useful , beneficial i.e. –biological , medicinal , agricultural, and other important area .

Scheme 1

Synthesis of 4-[2-substituted alkyl/aryl-5-methoxy -3-indolyleno]-3-ethanthioate-5-(-substituted - phenyl , 1,2 ,4 triazole: Take compound 1 i.e.- hydrazide 0.01 mole and potassium hydroxide KOH 1.5 mole , CS_2 1.0 mole are mix in a round bottom flask and add appropriate methanol to make proper solution and stirred for 2 h and than reflux 4 h ,checked progress of the reaction and poured it into ice cold water and neutralised by conc. HCl and get desire compound 2. Now take solution of compound 2 (0.01mole) - and substituted aldehyde -(0.01) - mole were added separate into glacial acetic acid , Reaction mixture is refluxed for 10 hr and solvent is distilled off at a reduced pressure to get triazole derivatives compound 3 and take compound (3) 0.08 mole in dry ether , CH_3COCl (0.16) mole was transfer into it slowly drop to drop with stirring and this mix content were poured to the crushed ice ,the solid(4) was separated with water . Which are desire triazole derivatives .[1]

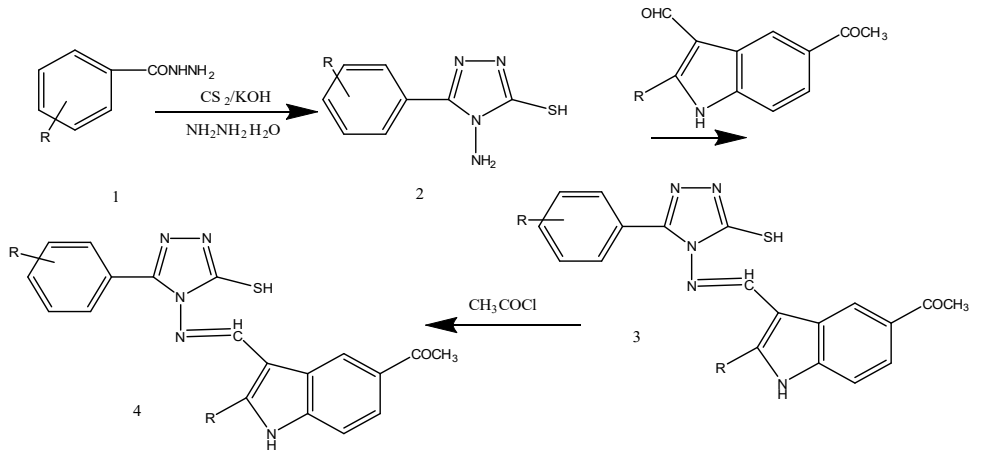


Figure 2

Scheme 2

Synthesis of 1-[3H-indol-2ylamino)methyl]-4-substituted 4,5 dihydro-1 H1,2,4,triazole-3-thiol : Take 1,3 benzothiazol-2-amine (1 mole in acetone and ethyl chloro acetate 1.0 mole was added drop wise in presence of potassium carbonate 4 gm and mixture was stirring and reflux it for 20 hr to yield acetate 6 and mixture of compound(6) are mixed with hydrazine hydrate and absolute ethanol are added and put it in microwave and irradiate for 6 min to get compound (7) , salt form of compound is also prepared by reaction of compound(7) and , KOH, 0.01mole and CS_2 0.01 mole and ethyl alcohol then reflux, cool to ice and dry to obtained compound 8 which again reflux with aniline /amine to get optimum compound (9) .[2]

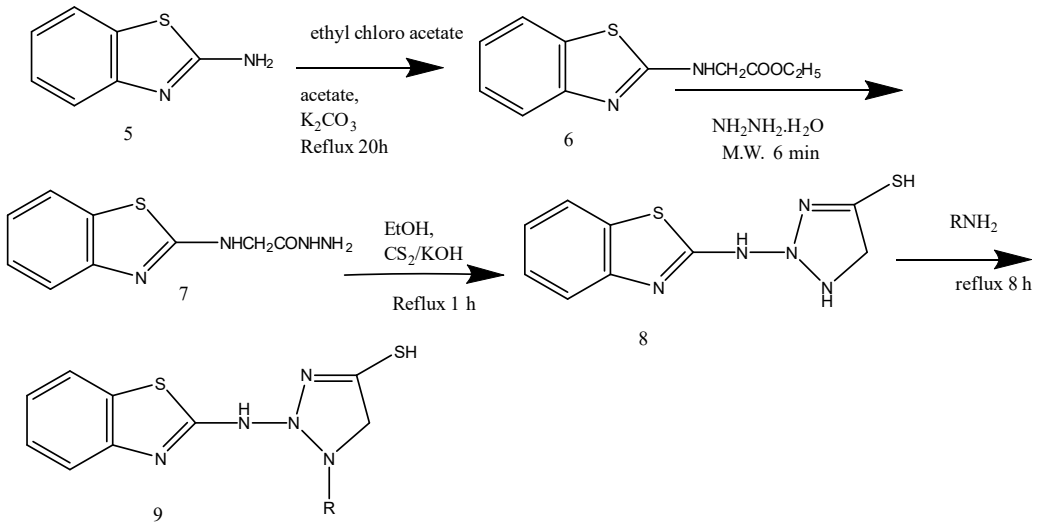


Fig 3

Scheme 3

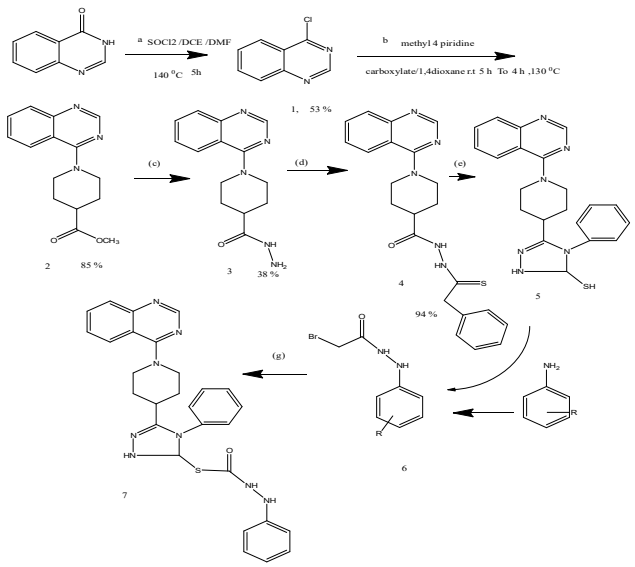


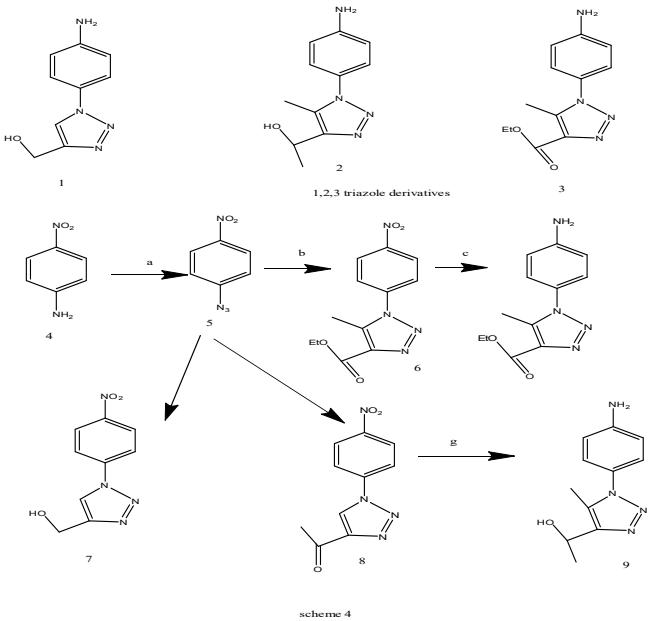
Fig 4

(a)- Thionil chloride (1) $SOCl_2$, (2) DCE (3) DMF, 139.8 °C, 5 - h (b) -Methyl Pipridine Carboxyl ate / 1, 4 dioxane 0r. t , 4-5 h , at 128 °C (c) NH_2NH_2 Hydrate/ CH_3OH ,reflux ,12.5 h (d) (1) PhNCS (2) C_2H_5OH ,100°C, 5 hour (e) (1) 10% potassium carbonate 110°C , 5h, (2) dil hydro chloric acid, neutral (Ph-7.0) , (f)(1) $BrCH_2COBr$(2) Et_3N (3) 1,4 dioxane 1,4 reflux .,5.5 hour (g) (1)Acetone ,(2) K_2CO_3 , 40 ^{0}C, reflux 3.5 h

Synthesis : Newly prepared 4-chloro quinazoline (1 gm 0.08 mole , methyl 4 pipridine carboxylate (0.83 -ml , 6.08 mole was shaking to 5h at ordinary temp. and it reflux for 4.5 h and cool, wash, dry to get pure form of precipitate of compound (2), then take ester of compound (2) 300 gm 1.10 mole + NH_2NH_2 hydrate 01.00 ml in methanol (5 ml) and was stirred and refluxed for- 14 h to obtained pure compound (3) yield 38 % mp -173 -175 ^{0}C then take the compound (3)- 0 .304 gram, 0 .112 mol and -Phenyl isothiocynate 0.16 mol 1.33 m-mol transfer to EtOH 12 ml. It refluxed for 5h, pure white solid precipitate of compound 4 is obtained yield 94 % mp- 195 -196 ^{0}C .for obtained compound 5 takes sol^n of K_2CO_3(Aq) 10 % 4 ml and add compound 4 , 100mg , 0.26 mmol heated to refluxed 5.5 h . Cool it, and neutralised with dil HCl to obtained Triazole (5) Mp 141-143, Yield 86% 0C colour white solid, to obtained compound 6. It is prepared by Barkar at all [3].

A mix content of substitute aniline (3.1 mmol) , triethyl amine 1.15ml take in dioxane dry (6 ml ,It was stirred at 0^{0}C for 6 min now bromo acetyl bromide 1.054 mol content dissolve in dioxane (dried) 6 ml transfer it drop wise and stirred continues for 5 h , then reaction mixture transfer into cold ice water ,wash dry and finally compound of amide 6 is obtained yield 58 to 95% , a mixture of compound 5 which is a triazole , triazol 50.00 mg, 0.13mmol), K_2CO_3 9 mg 0.07 mmol . and reaction mixture of compound 6 , (0.13mmol) is add to acetone 5 ml then it was stirred at 42 ^{0}C , 2-4 h then transfer into cold ice water then resulting compound 7 is obtained yield 58-92 % [4] .

Scheme 4



scheme 4

1, 2, 3, triazole derivatives

Reagent (a)$NaNO_3$ -HCl (b),$(C_2H_5)_3N$, Di methyl formamide, ethyl acetoacetate (C) Pd -C, $HCOONH_4$ (d) (1) Ascorbic Acid , copper sulphate , sodium bi carbonate, C_3H_4O alcohol,(propargylic) (e) Zinc , ammonium Chloride + H_2O (f) triethyl amine , Acetyl Acetone (g) sodium borohydride - CH_3OH , $CuSO_4$.hydrated .

A: Formation of a 1-(- 4-nitrophenyl)-1H-1, 2, 3, triazole-4yl-methanol (7):

Take 30 ml 6 N, p -nitro aniline 3.0 gm, 21.7 mmol is transfer into it with magnetic stirrer now add $NaNO_3$ 1.5 gm 21.74 m mol in 20ml H_2O drop wise maintain temperature 0-5^{0}C stirring for 1h and NaN_3 1.41 gm, 21.74 m mol in 20 ml H_2O with vigorously stirring then product 5 obtained, yellowish solid 90% yield now take compound 5, 1.2g 7.30 mmol in tert-butanol 6 ml add, a content of ($C_6H_8O_6$ascorbic acid) -0. 28 g ,0.16 mol copper sulphate hydrated ,0.145 g , 0.580 m mol (d) $NaNO_3$ 135mg 1.6 m mol + 5.0 ml. H_2O after it alcohol propargylic 0.520 ml 9 m mol add it stirred for 24- 48 h the brownish solid product is obtained yield 78% .

B: Synthesis of (1-(4-aminophenyl-1H1, 2, 3, triazole -4 yl methanol :

Take a sol^n of compound (7) ,1.54 gm 7.0 m mol in water 40 ml NH_4Cl 750mg 14mmol and Zn crushed 03.3250 gm , 50.80 mmol add to it .then stirred at low pressure ,the product colour- white (s) ,Yield- 83% .

Formation 1-(5 methyl –(4 nitro phenyl) -1-H 1,2,3 triazole 4- yl- ethanone (8):

0.693 mg 03.20 mmol of compound (5) and 1.70 ml DMF , the solid was solubilised by magnetic stirrer at , room temperature 1.20 ml of trimethyl amine , 0.90 ml of ethyl acetone add into RBF and stirred for 24 h and product obtained in powder form is 75% yield (8)

1- (1- (4 amino phenyl)-5 methyl-1H 1,2,3 triazole -4- yl) ethanol Synthesis (2)

Take 0.208 g of content (8) in methanol 5 ml 0.80 ml CuSO4 saturated Sol^{n} and in other flask 0.190 g , sodium borohydride in 6ml water + methanol 1:1 mixture , temp. ice water bath (5-10)^{0}C and portion of flask 2 transfer into flask 1st CuS black ppt is obtained .CuS filter ,methanol distilled, the concentrate content part was solubilised in ethyl acetate and extract by water, the organic phase dried with Na_2SO_4 anhydrous .the solvent is dried at reduce pressure a purplish solid is obtained 79 % yield .[5]

Scheme 5 Synthesis of compound 5) ,1-(1H1,2 ,4 triazole - 1-yl) - 2- (2 ,4-difloro phenyl -3-substitute -2 propanol

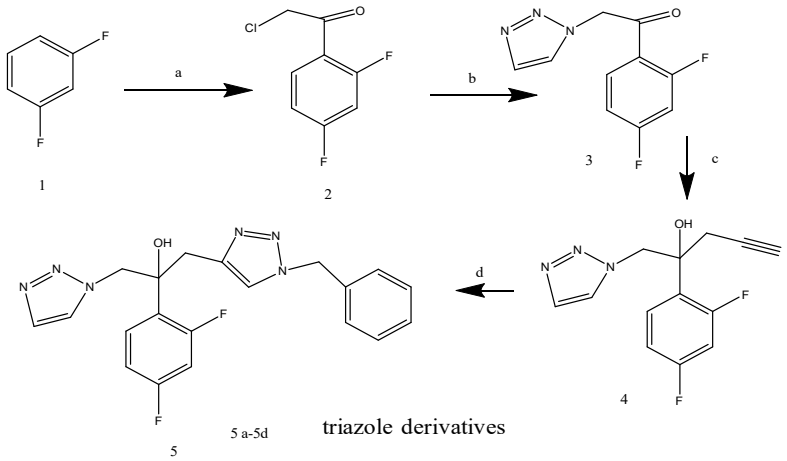


Figure 6

(a), 50 ^{0}C , $AlCl_3$, $ClCH_2COCl$,5 h , 85 % (b)1- H-1,2,4 triazole , sodium bi carbonate , Toluene reflux ,5 h , 60 % (C) Zn , propargyclic Bromide DMF / THF 60^{0}C , 6 h 95 % result (d) NaN_3 substitute Benzyl Bromide ascorbic Sodium , $CuSO_4$, DMSO , 86% Compound 2 is obtained by reaction of compound (1) and chloro acetyl chloride [6] and compound 4 is synthesised by nucleophilic addition of compound (3) propyl Bromide , presence of Zinc in DMF sol^{n} on 27 ^{0}C .[7] and the compound (5) is obtained by Click reaction between compound (4) and CuI catalyse 1,3 dipolar cycloaddition with substituted azedomethyl benzene [8,9]

Scheme 6 Synthesis of triazole: Synthsis 1 arial - 5 methyl - 1 H – 1 , 2 , 3 triazole 4- carboxylic acid

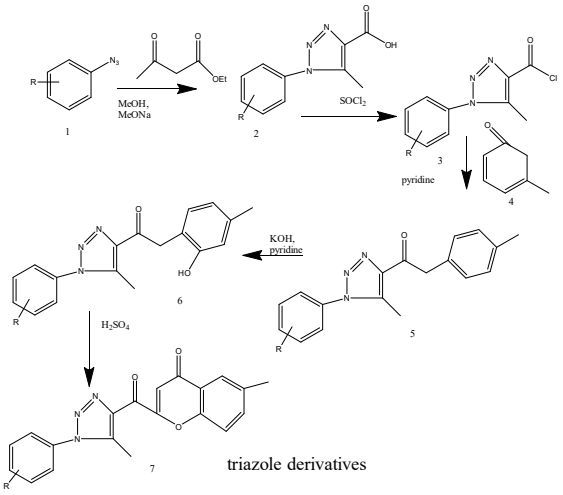


fig 8

The reaction of Arial azide with ethyl chloro acetate to form triazole derivatives [1]

Scheme7 To Synthesis new of triazole derivatives

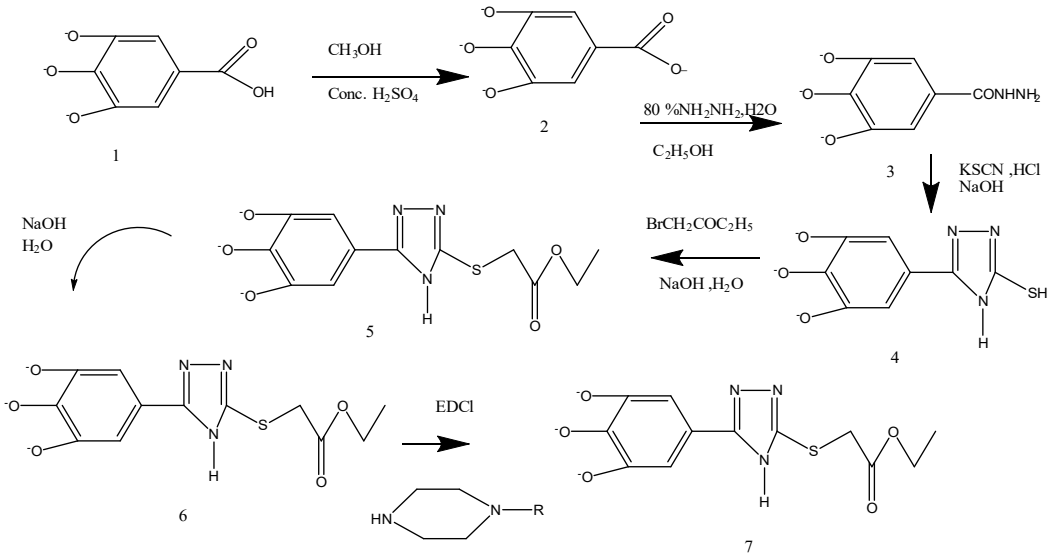
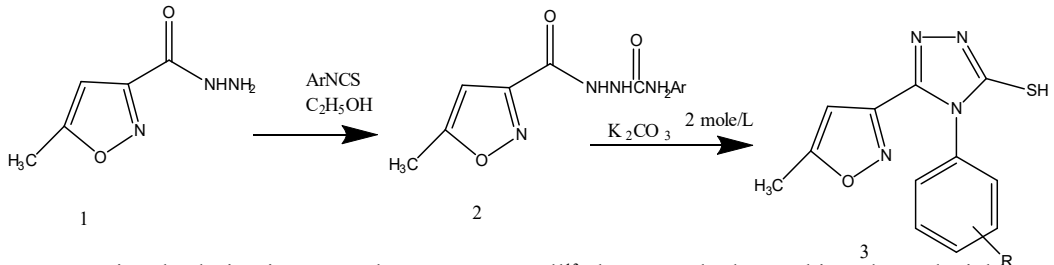


fig 9

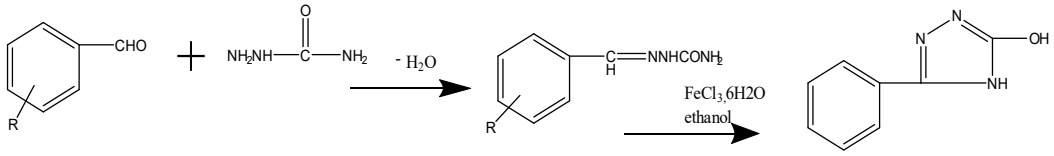
The compound(1) is aromatic acid take 0.01 mol in methanol in which few drops of conc. H_2SO_4 added and transfer into RBF and add , 0.01 mol hydrazine in ethyl alcohol and stirrer and reflux to form compound (2) and compound 2 is taken in RBF and reacted with potassium thiocynide in NaOH to form triazole derivatives of compound 3, [11,12] .

Scheme 8



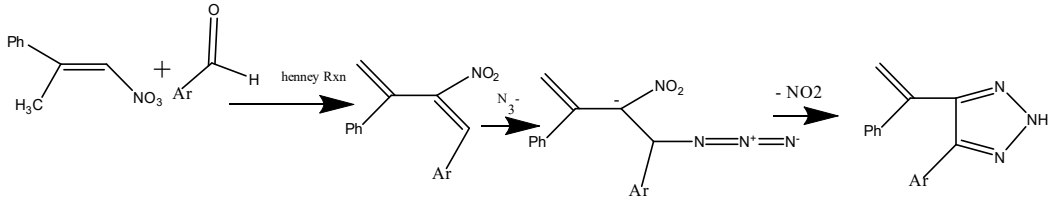
triazole derivatives : Taherpospour et all[13] have worked to achieved good yield on microwave assisted application to synthesis 1H- Phenanthro [9 ,10 } [1 ,2 ,3]Triazole help of a 1:3 Dipolar cyclo addition reaction between Sodium azide and 9 bromo phenanthrene under condition potassium tert butoxide in DMSO solvent .[13]

Scheme 9



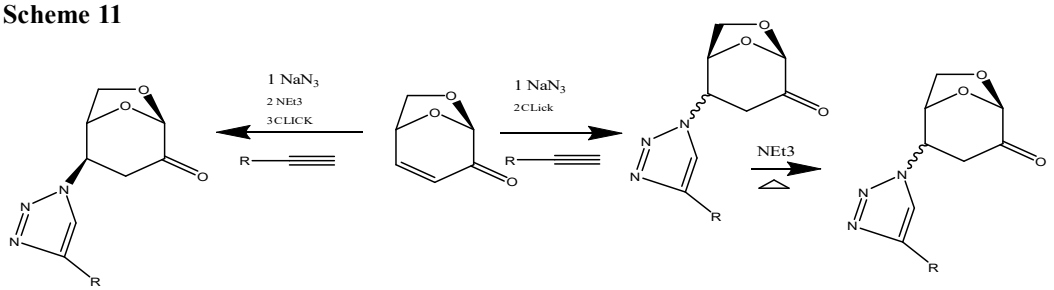
Gupta at, all.[14] have worked and studies 1 (Substitute Benzylidene Semicarbazide used for preparation , very active as well as biologically beneficial active molecules i.e.- 3 substitute phenyl 4 H – 1 , 2, 4 , triazole moiety derivatives .

Scheme 10

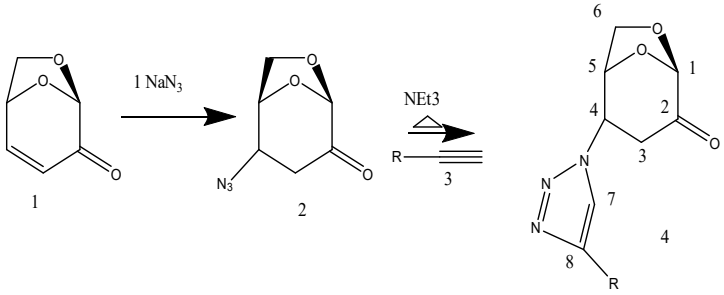


Sen Gupta Et All [15] reported and worked on Lewis base – catalysed 3 component part cascade preparation 4 , 5 disubstitute 1, 2, 3 triazole of new N H triazole compound made by it , vinyl group C-4 allow easy change to different triazole moiety derivatives .

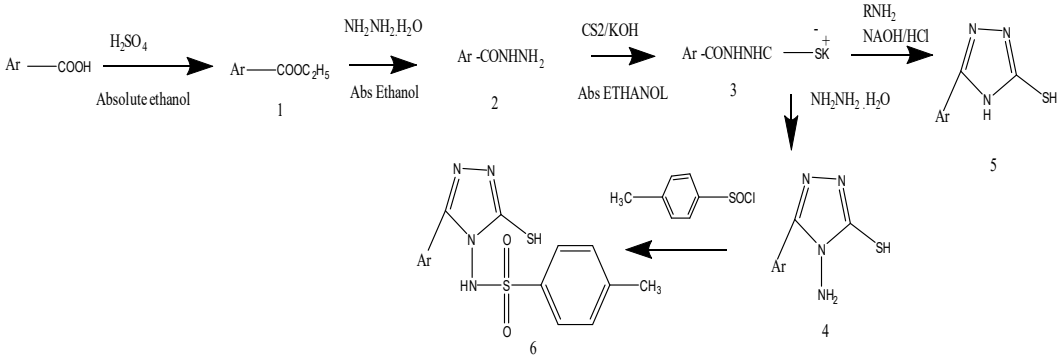
Scheme 11



Martin Tersa Flipe At, All, is reported that in this reaction 4 equiv .NaN_3, 40 equiv. of AcOH, and 0.2 Equiv. of Et_3N, CH_2Cl_2 then the reaction performed and result comes about 81 % .á , â unsaturation presence in compound 1st as Michael acceptor and installation azide group at C- 4 product the compound (2) It is reacted against different alkynes -3 Cu I catalysed to produced desire product 4

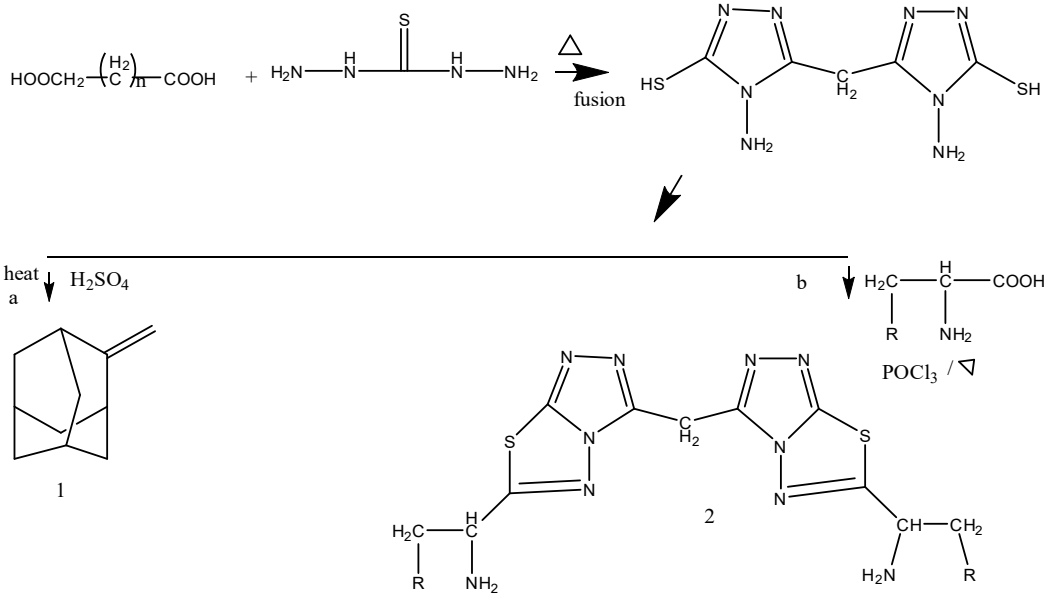


Compound 4 is triazole derivatives which is used as an anticancer agent[16] compound 4,5 ,6 show antifungal and ant bactericidal activity .



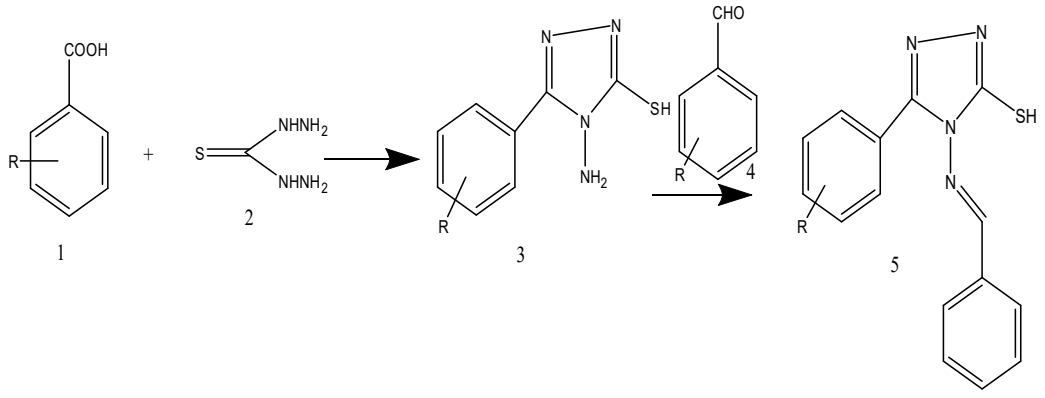
Dilip Kumar at all[17] are synthesis to desire triazole derivative , compound (1) benzoic acid or 4 substituted benzoic acid 0.1 mol in ethanol in RBF and 5.7ml H_2SO_4 dissolve by ethanol 90 ml and reflux 4 h. It transfer to chilled water, synthesis ester were extract with CCl_4 and was with 20% sodium bi carbonate and after drying on $MgSO_4$ pure compound1 is obtained then it reacted with hydrazine hydrate(0.01 mol)drop by drop and C_2H_5OH 0.15 mol and refluxed 4-5 h . acid hydrazide (2) is obtained and recrystallised by ethanol, now take KOH 0.150 mol 100 ml C_2H_5OH and 0.10 mol of compound 2 treated with 0.150 mol , carbon disulphide and was stirred for 12-16 h the solvent distilled off – compound of potassium dithiocarbazinate (3) is obtained . and a suspension of compound (3) , 0.10mol in absolute alcohol NH_2NH_2 hydrate and 6 ml H_2O , it is reflux 2-3 h , solution colour change with evolution of H_2S gas cool and add 100ml distilled water then acidified by conc. HCl and then pure compound of triazole derivatives is obtained progress of the reaction is monitored by TLC and eluent used chloroform and acetone 4:1 yield 72-80 % the desire compound show activity against anti bacterial and antifungal .[17]

Scheme 12 To synthesis bis – (4-N-amino 5- marcapto 1, 2, 4 triazole 3 yl) alkanes



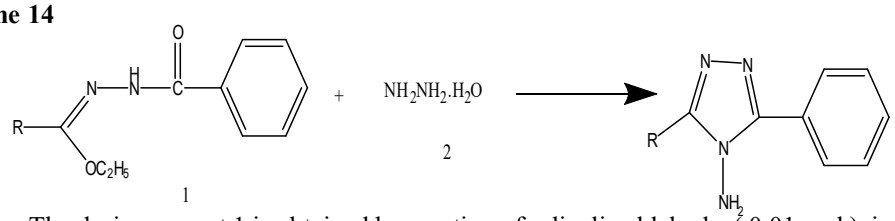
Take dicarboxylic acid 0.1 mol and thio carbohydrazide in 1:2 ratio and heated in RBF in oil bath until it melt the content maintained 15to 20 min at it now the product is cool and treated it with sodium bi carbonate to obtained desire compound of triazole derivatives is obtained then compound 1 and adamantane reacted 1:2 in DMF in ethanol on oil bath 4-5 h after it add few drop of H_2SO_4 , after cooling, filtration, drying recrystallised by DMF to obtained Schiff base compound 2-and again take 3 neck quick fit flask, fit it by dropping funnel ,and attached a condenser to part 1 phenylalanine and phosphorous oxy chloride was added and refluxed for 2 hr at oil bath and after concentrated cool and transfer to crushed ice water to obtained desire product [18]

Scheme 13: Synthesis 4amino of 5phenyl-4H-1, 2,4triazol-thiol



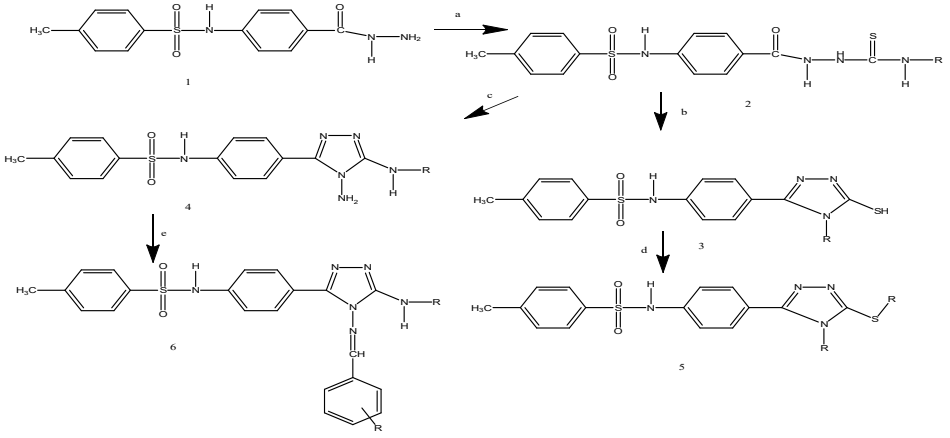
D .K .Jain et. all Synthesis the 1 , 2 , 4 - triazole moiety derivatives i.e. – a novel series , Schiff base of 4 benzylidine amino -5 -phenyl 4H 1 , 2 , 4- triazole 3 - thiol molecules which show antimicrobial agents to prepare the compound 3 like substituted benzoic acid (0.01 mol) , and - thio carbonate 0.01 mol warm untilled it melt and it maintained at 145^0 C at 40min , Product obtained it cool and treat with sodium bi carbonate sol^n to neutralize and wash with water and recrystallised by ethanol and pure compound of triazole derivatives is obtained and to form Schiff base it reacted with substituted benzaldehyde 0.2mol to obtained of triazole deririvatives 4 (benzylidene amino) - 5 phenyl 4- H-1 , 2 ,4 triazole 3-thiol is obtained by adding substituted (0.2 mol) in ethanol and compound 3 is heated until a clear solution is obtained then few drop of con H_2SO_4 is added and solution was refluxed for 6h on water bath and purified and obtained pure triazole derivatives .The base triazole derivatives work against anti bacterial and anti fungal activity. [19]

Scheme 14



The desire reagent 1 is obtained by reaction of salicylic aldehyde (0.01 mol) is dissolve in H_2O , KOH (0.01) mol alcoholic which contain in 100 ml ethanol ,then solvent C_2H_5OH is vaporise was removed and residue portion is dissolve by DMF 20 ml , suitable dihalide 0.005 ml and this content reflux 6min in this process KCl is separate out , now solvent remove and obtained pure amino ester compound 1 now take ethanol25 ml 250 ml beaker , hydrazine 0.01 mol to iminoester hydra chloride 0.01 mol add ethanol absolute and the reaction content was stirred 6h at 0-2 ^{0}C and 1- 2 h at normal temp. , then this Reaction content is transfer into beaker contain cold water -ice (40 ml + ice 10gm) In this condition precipitate formed and it dried, product recrystallised by 1:2 petroleum ether vs. benzene to obtained pure triazole unit derivatives which show bacterial and fungicidal properties .

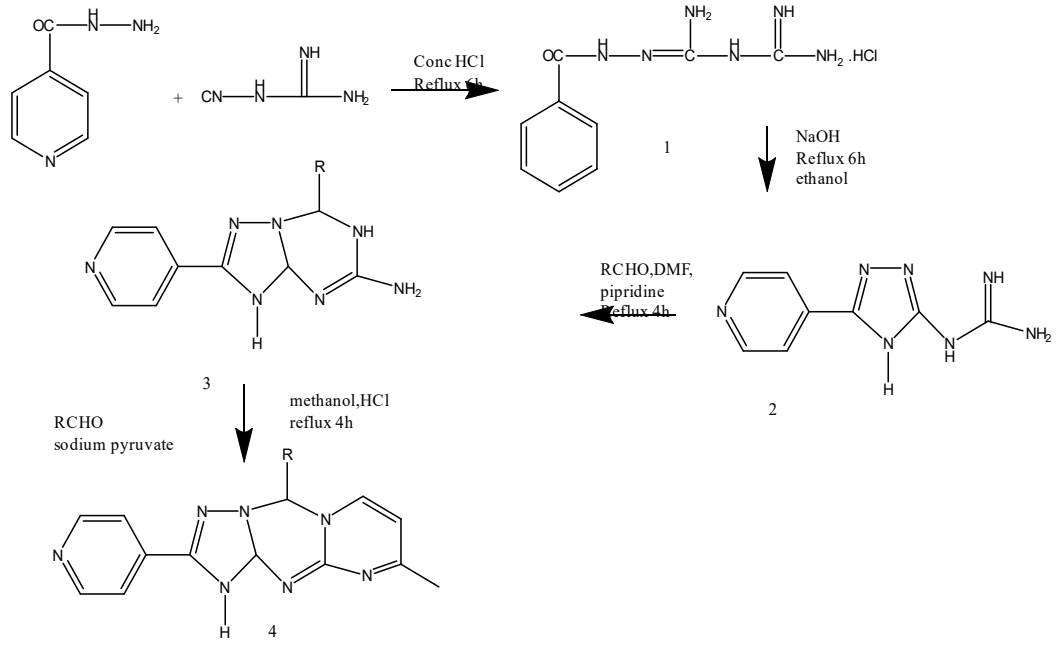
Scheme 15



(a) R-NCS/Dioxane (b) 2M NaOH/Reflux (c) NH_2NH_2 (d)RX/KOH/EtOH (e) 2,4,5, trimethoxy Benzaldehyde / EtOH/HOAc/Reflux

To take acid hydrazide 1.610 gm 0.002 mol in dioxane 20ml substituted isothiocynate 0.002mol was added and stirred to overnight then product 2 is obtained after purified. Now take compound (2) - 4 substituted 5– (4-tosylate imino) phenyl-4H-1,2,4 triazole-3- thiols and solid thiosemicarbazides (2) ,0.002mol to 20ml 2M NaOH and refluxed for 10 h reaction , the progress of the reaction checked and to cool and filtrate is acidified by AcOH then precipitate of desire compound (3) is obtained then a mixture of compound (3) thio-semicarbazide (3) 0.002 mol hydrated hydrazine 0.025mol dissolve by methanol 20 ml , it reflux on water bath and checked the purity product form by ethyl acetate : petroleum ether 1:1 and content transfer into crushed ice and get desire compound (4) is now take the mixture of 1,2,4 triazole of 3 thiol (3) , 0.1 mol and alkyl halide or chloroacetamide derivatives 0.1 mol in ethanol 30ml containing KOH 0.12 mol was stirred at room temp and product obtained 5,6 which show antimicrobial activity [21]

Scheme 16

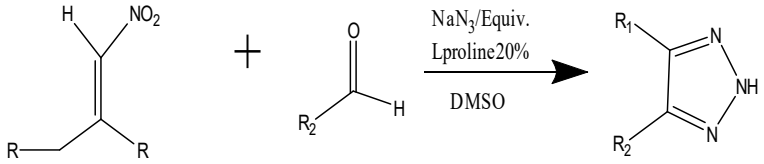


Babu at .all, Synthesis a triazole derivatives in it isoniazide 0.05 mol and cynoquinadine 0.05 mole conc. HCl 10 ml and 100 ml alcohol and refluxed 6h and cool ,dried and purified to separate the desire compound (1) mp-185 ^{0}C .Yield 87 %.

1-[amino(isonicotenoyl carbono hydrazonyl]quinidine HCl, and now take compound (1) 9.24 gm 0.02mol and 10 % NaOH25 ml the content were refluxed 6h on water bath the resulting solution now cool to room temperature , purified in 25 ml water and dry to obtained 2-(3-pyridnyl-1H-1,2,4, triazol -5yl quinidine(2) mp-306-310 ^{0}C yield 85 % .now compound (2) taken 0.005 mole in

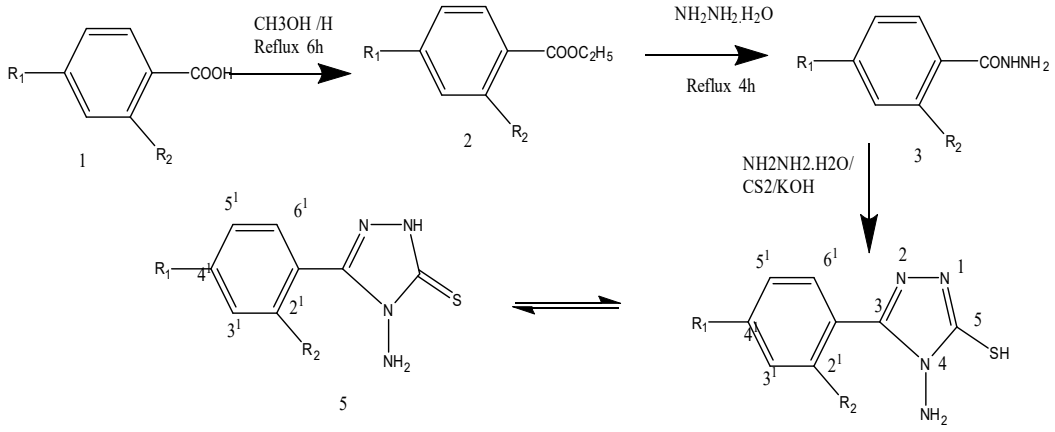
RBF dissolve by DMF 25 ml and added suitable substituted benzaldehyde (0.01 mol 5 drop of pipridine and the mixture is refluxed 4 h and content was transfer into cold ice water and separate solid form collect by filtration and it is recrystallize by ethanol and water mix portion 80:20 , now take the solution of compound 3rd in RBF 0.01mole in methanol and sodium pyruvate 0.005 mole and formaldehyde 0.005 mole and 1.0 ml of conc HCl and content of the flask reflux 4 h, cooled and separated solid form and it is collected by filtration method , now again recrystallized by appropriate solvent and the desire product achieved as in the form of triazole derivatives [22]

Scheme 17



To synthesis a triazole derivatives from a base method nitro alkene –aldehyde coupling , nitro alkenes is reacted with aromatic aldehyde in presence of base NaN_3 and a solvent for about 2 to 5 h to desire temperature or room temperature , the synthesised compound may be 4,5 di substituted 1,2,3 triazole in it â substituted alkene and aromatic aldehyde having any 6 carbon atom either substituted or not [23] .

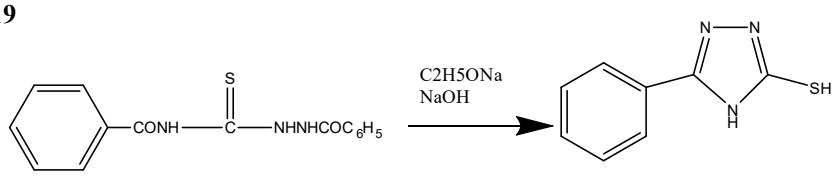
Scheme 18



To form triazole compound(2) 60 ml methanol in RBF (1.50 mol) conc H_2SO_4 2,3 ml and benzoic acid derivatives and refluxed for 5 to 6 h then cool to room temperature and then content was concentrated to rotator evaporation and it dried over room temp. , recrystallised by ethanol to obtained compound(2) in ester form which take 0.01 mole and hydrazine hydrate 6.00gm .12mol in ethanol to reflux to 4-5 h . Now cool and dry compound 2 is obtained and re crystallised to proper solvent , then compound (2) acid Hydrazide (0.01mol) acidified is add ethyl alcohol contain KOH 1.6 gm and CS_2 , 1.8 ml is add and mix content stirred for 11 h and now diluted it by ether , shake and stirred further 1-2 h, potassium salt is applied further purification , 99%(0.02 mol 1.00 gm was

gradually added to the above potassium salt then dissolve in water 20 ml with stirring and mixture gentle reflux 3 h during which H_2S gas evolved and colour dark green obtained and it cool to 5 ^{0}C and acidified, solid separate out it filter and obtained a triazole derivatives .[24]

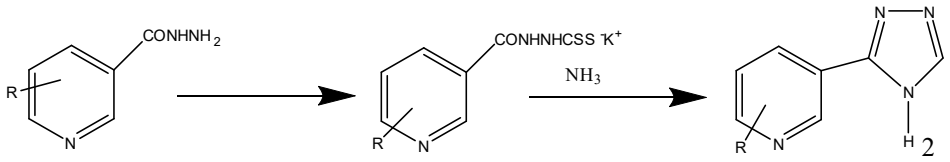
Scheme 19



1

Triazole derivatives are synthesis by Dharmesh and S, dayama et. all to synthesis 5 substituted 1- H 1, 2, 4 , triazole - 3- thione 4 by cyclisation into 1 benzoyl 3- thio semicarbazide (3) using aqueous sodium hydroxide/ sodium ethoxide and hydrazine hydrate[25].

Scheme 20



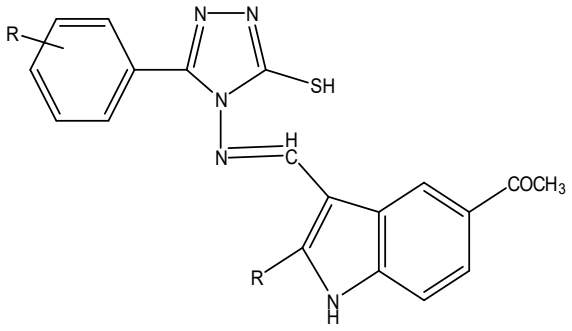
Where R is various substituted aromatic ring part 1, 2, 4 triazole 5- thiol (2) was compound to various chloro acetanilides it, which triazole show antifungal and anti tubercular activity [26].

Triazole Derivatives and Their application In Biological and Pharmaceutical field

Triazole unit containing derivatives antifungal drug i.e. Fluconazole, Isovucanazole, Itraconazole, Voriconazole, Pramiconazole, Ravuconazole and Posaconazole.etc show very affectivity against biologically protactivity. Now a day's no of different molecules have to synthesis which is very beneficial for alive nature

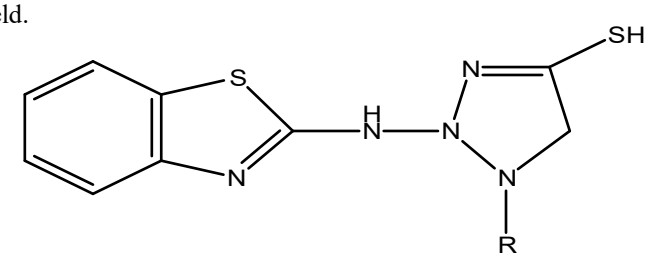
Scheme 1

Compound 4in scheme 1 it is a triazole derivatives, this molecules of triazole show Antibacterial Activity of New Substituted Azetidinyl Indolyl Triazole Derivatives



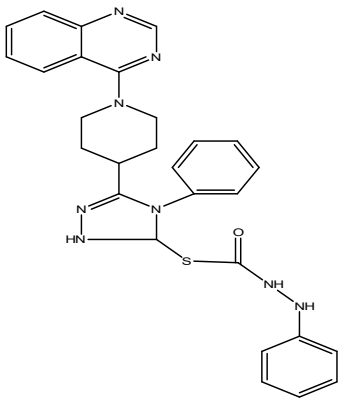
Scheme 2

Triazole derivatives of scheme 2 product 8, 9 shows expected result against biological and pharmaceutical field.



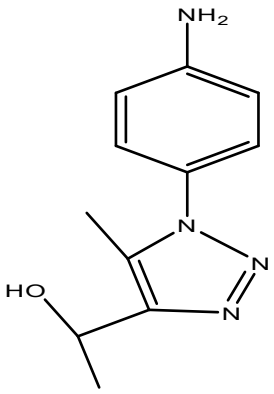
Scheme 3

The Quinazolinyl Pipridinyl unit, N (-Substitute Phenyl) Acetamide function part work As Efficient Bactericides protect Phyto pathogenic Bacterium, Xanthomonase Orazae P V



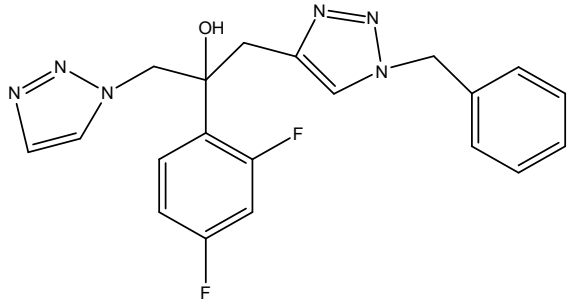
Scheme 4

Scheme 4, product7, 8, of 1, 2, 3, Triazole Derivatives and It show properties against As Corrosion Inhibitor for Carbon Steel.

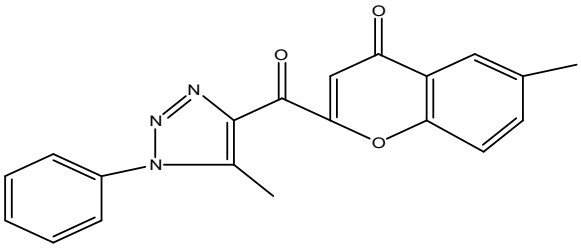


Scheme5

New Triazole Derivatives in scheme 5 p. 5 work As Antifungal Agents, and effected Molecular Docking properties it also work in the, Bio Organic and Medicinal area.

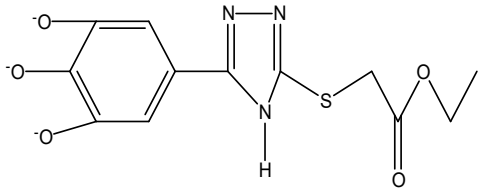


Scheme 6 1, 2, 3, Triazole Derivatives in scheme 6 p-7 and their work against Anti Cancer Activity.

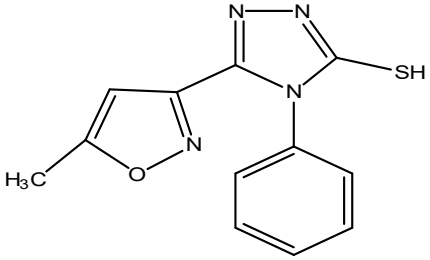


Scheme7

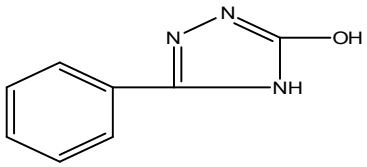
The compound, Novel 1, 2, 4 –Triazol unit Derivatives Contain an Amide Moiety in scheme7 p-7work as Antifungal Activity.



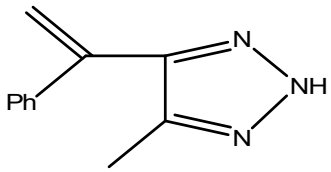
Scheme 8: triazole derivatives of scheme 8 p -3 molecules is very effective in biological field



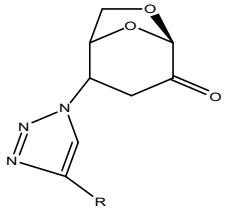
Scheme 9: Triazole Derivatives in scheme 9 p-2 And Their work as Antimicrobial And Insecticidal activity .



Scheme10: Triazole derivatives of product of scheme 10 p -3 show appreciable effective against biological activity.

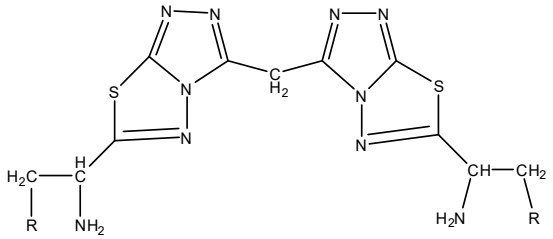


Scheme11: In scheme 11 p-1, 2 Triazole moiety Derivatives of Levoglucosenone protect Cancer activity and it show Effective Exploration antibacterial activity.

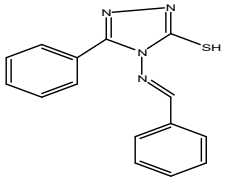


Scheme 12a: Triazole derivatives of product of scheme 12 p -4, 5 show appreciable effective against biological activity as Anti Microbial.

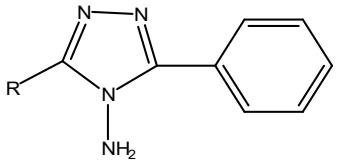
Scheme12b Triazole Derivatives work As Probes for Cytotoxicity activity



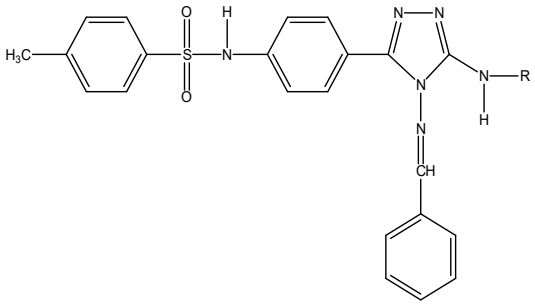
Scheme13: Triazole derivatives of product of scheme 13 p -5 show appreciable effective against biological activity Antifungal And antibacterial Activity Novel 1, 2, 3-Triazole Derivatives.



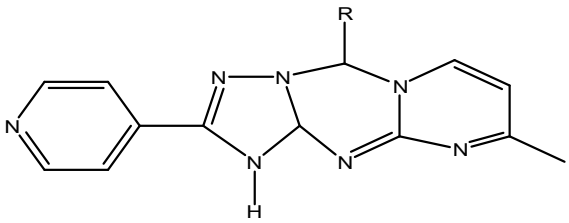
Scheme14: New compound Bis 1, 2, 4 – Triazole Derivatives show valuable nature against fungal and bacteriacidal activity.



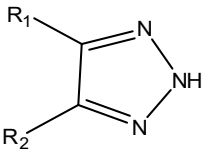
Scheme15 : Triazole derivatives of product of scheme 15 p -5, 6 show appreciable effective against biological activity cytotoxic properties, Antimicrobial Activities Of new 1, 2, 4, Triazole moiety Derivatives In Corporating Aryl Sulphonamide.



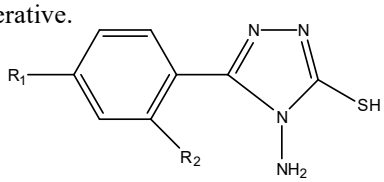
Scheme16: Product of Novel Triazole Derivatives scheme 16 p -4 work as Of Ant tubercular Activity.



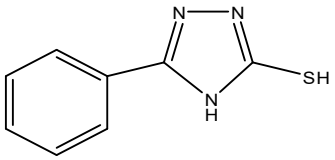
Scheme17: Triazole derivaties Product of Novel Triazole scheme 17 p -1 work as anti bacterial properties.



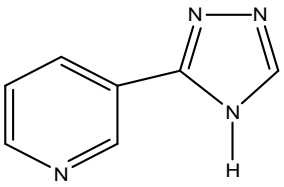
Scheme18 : Scheme 18 compound 4,5 of 1,2,4 Triazole Derivative show valuable effectiveness, Activity against Anti proliferative.



Scheme19: Scheme 19 compound -1 represent Biological activity.



Scheme20: Scheme 20 Compound 2of triazole 1, 2, 4 derivatives show Antifungal and Anti Tubercular 1, 2, 4



Conclusion

Different derivatives of triazole which is two isomeric forms i.e. 1, 2, 3 and 1, 2, 4 are very important. Drug of triazole i.e. flucanazole, itraconazole, isovucanazole and so many other drug which contain triazole moiety are very useful. BY the study and evolution of different molecules , it conclude that it work against antifungal ,antibacterial , ant tubercular , corrosion inhibitor, in agriculture , antimicrobial etc . Over all we conclude that triazole derivatives are very effective against different diseases and various field in last decade and to develop new effective molecules in challenging field .

References

1. A, Kumar Et All: Synthesis And Antibacterial Activity Of New Substituted Azetidinyl Indolyl Triazole Derivatives Indian Drug 47 (6) June2010.
2. Parminder Kumar .All ,Int.Res.J.Pharm.20109(7) .
3. J, M , Hung : H , J Arab Shahi : E, Lung : J , Renison: D Burkar : Eur . Med. Chem. 2014, 86, 420-437.
4. Lan , Yang : Xiao-Ping Bao*, Synthesis Of Novel 1,2,4,Triazole Derivatives Containing The Quinazolinyl Pipridinyl Moiety And N(-Substituted Phenyl) Acetamide Group As Efficient Bactericides Against The Phyto pathogenic Bacterium, Xanthomonase Orazae PV . Orazae+ Rsc. Adv. 2017, 7, 34005.
5. Colrin Et. All .Synthesis Of 1,2,3,Triazole Derivatives and Its Evaluation As Corrosion Inhibitor For Carbon Steel International Journal Of Electro Chemistry Vol. 2019 , 6759478 .
6. Chai,X,Y : Zang , J : Cao ,Y: Hu , H ,G : Yu , S, C : Sun ,Q,Y : Dan ,Z ,G Jiang ,Y ,X : Wu , Q ,Y: Eur. Med. Chem. 1913, 2009 , 44 .
7. Pore V,S : Ahir ,N, G : Kumar ,M ; Salala ,P,K : Tetrahedron 2006 , 62 , 11178 .
8. Zang , X , J : Li , H, Y : You , L , F :Tang ,Y : Hsung R,P : Adv. Synthesis ,Lett . 2006 , 348.2437 .
9. Ming Juang Et .All, New Triazole Derivatives As Antifungal Agents, Synthesis Via Click Reaction In Vitro Evaluation And Molecular Docking Studies , Bio Organic And Medicinal Chemistry Letters. 22,2012, 2959-2962 .
10. Pokhodylo , Nazare : Shyka , Olga : Malechuk , Vasyl : Synthsis Of 1,2,3, Triazole

Derivatives And Evaluation Of Their Anti Cancer Activity : Sci. Pharma. 2013, 81, 663-676.

11. Wu,Wen, Neng : Jiang ,Yang ,Ming :Fei,Quang : Du , Hai ,Tang : Yang, Mao, Fa : Synthesis And Antifungal Activity Of Novel 1,2,4 –Triazol Derivatives Containing An Amide Moiety J. Heterocyclic Chem. . 2019, 1-8 .
12. F, Yang : C, P ,He : P,C , Diao : K ,H, Hang : J,J Rao*: L : Bio Organic Med . Chem. Lett 2019, 2019 (1) 22-7.
13. Taherpour , A , A :Faraj , H : One Pot Microwave Assisted Synthesis Of 1H Phenanthro [9,10][1,2,3]Triazole Molbank , 2008 ,M ,577 .
14. Gautam , N : Chourasia O,P :Synthesis , Antimicrobial And Insecticidal Activity Of Some 4- H, 1,2,4 Triazole Derivatives Int. J. Chem.. 2010, 4913, 956-959.
15. Daun , H : Sen ,Gupta ,S :Peterson , J , L : Shi , X : Synthesis And Characterization ,2009 , 28,2352 ,2355 .
16. Tsai , Hsuan Yi: M,carla,:Elicheti, Borini : Benedetso , Di Carolina : Girardini ,Javier : Martina , Terra Felipe S,A,R : S,G,A: S,M,A Synthesis Of Triazole Derivatives Of Levoglucosenone As Promising Anti Cancer Agents Effective Exploration Of The Chemical Space Through Retro Aza. Michael//Aza Michael Isomerisation.
17. Pal , Kumar , Dilip : Singh , Vipul : Pandey , Desh , Deepak: Mourya ,Roopesh Synthesis Characterisation And Anti Microbial Evaluation Of Some 1,2,4-Triazole Derivatives , International Journal Of Pharmacy And Pharmaceutical Science 2014 ,Vol 6 , Issue 8.
18. Amine Al Md : Islam Rabual ,M : Synthesis Of Some Bis Triazole Derivatives As Probes For Cytotoxicity Study . Bangladesh, J. Pharmacol. 2006, 21 -26.
19. Gupta ,Deepa : Jain D. K : Synthesis Antifungal And antibacterial Activity Of Novel 1,2,3-Triazole Derivatives , J. Adv .Pharma .Tech. Res .2015 ,6 : 141 -6 .
20. Bekirkan ,Olcay : Bektas , Haken : Synthesis Of New Bis 1,2,4 –Triazole Derivatives Molecules 2006,11, 469-477 .
21. A ,Hanan: Fatah, Abdul ;Synthesis, Cytotoxic And Antimicrobial Activities Of Novel 1,2,4, Triazole Derivatives In Corporating Aryl Sulphonamide Moiety .Asian Journal of Pharmaceutical Analysis And Med. Chemistry-2 (3) 2014, 145 -152 .
22. Babu , Raghvendra ,N : Kulandaivelu,Umashankar :Rao, Koteswara N,S, G : Alavala Reddy Rajshekar : Padmavati , Y :,Reddy Madva B :Design ,Synthesis And Evaluation Of Ant tubercular Activity Of Novel Triazole Derivatives , IJPSR 2020 Vol. 11 (6) 2920 -2925 .
23. Shi, Xiadong: Morgan, Town: MV: Synthesis Of Triazole Derivatives From Lewis Base Mediated Nitro Alkene Aldehyde Coupling .US Application Publication 2009/0048451 A1.
24. Singh ,Tanu , Shree : Singh ,Jagdesh :Naskar , Arup : Gosh ,Tirath : Mandal, Arijet : Kundu , Maritungy: Harvansh, K, Ranjeet : Maity ,Kumar ,Tapan : Synthesis And Evaluation Of Ant proliferative Activity Of 1,2,4 Triazole Derivatives Against RAC Bearing mice Model. Indian Journal Of Pharmaceutical Education And Research Oct –Dec.2012 / Vol .46 / Issue 4.
25. Dayama D.S : Khatale P,N: Khedkar S,A : Nazarkar,S,R: Ved Pathak : Synthesis And Biological activity Of Some novel 1,2,4 Triazole Derivatives Pharma . Chem. 2014, 6(5), 123 -7.
26. Mali, R,R : Toraskar, M ,P :Mali, K,K : Naik ,P,P : Shirodkar ,P,Y :Synthesis Of Some Antifungal And Anti Tubercular 1,2,4 Triazole Analogoue I .N. J Chem.Res .2009, 1 (2) 168-73 .