Design, Synthesis, and Microbial Screening of Some Novel Chalcone Derivatives

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Abstract

N-Heterocycles are also very significant in the medicinal domain as they have got biological activities. Compound of N heterocyclic pyrazole 1,3,5 triphenyl -1H Pyrazolines and their various requests has been synthesized with five membered ring structure as one such derivatives. The compounds 3-5 were identified by IR, 1H-NMR, Mass spectra and elemental analysis. According to the literature They have some valuable biological activities. Thus the bioassay of those chemicals should be as a result of biological screening.

Keywords: *N- Heterocyclic, pyrazole, Biological screening*

1.Introduction

N – Heterocycles are also among the compounds of ineluctable contribution in the structure optimization for drug molecules because N-heterocylic are an important class of natural and synthetic components with a several members known to demonstrate useful biological activities [1]. The importance of five-membered system containing two neighbouring nitrogen atoms follows from saturated and partially saturated pyrazoles in bioactive compounds as well as of natural origin [2,3]. And the pyrazolines or analogous bearing different substituents are important bioactive molecules. Therefore lot of research has been devoted for this class. 15drugs in the management of infections, especially as an antibacterial, antifungal, anti-tumours, anti\-tubercular anti\viral and anti \ HIV.

The literature makes clear that 2-pyrazolines with various aryl groups as substituents have been the focus of a large amount of heterocyclic chemistry study in recent years. According to reports, pyrazolines exhibit a wide range of biological activities, such as antibacterial [4], antifungal [5], anti-inflammatory [6], and antidepressant [7]. Because of the pyrazoline function's stability, scientists have been motivated to create novel compounds with biological activity by using this stable segment in bioactive moieties.

Pyrazolines are synthesized using a variety of techniques, such as condensation of chalcones with hydrazine and phenyl hydrazine [8–12] and condensation of chalcones with thio-semi carbazide in ethanol under high basic or acidic conditions [13]. 6-(3-acetyl-

phenylamino) pyridazin-3(2H)-one was reacted with substituted aromatic aldehydes in the presence of alkali to produce the required chalcones [14]. Pyrazolines are often formed when equimolar amounts of chalcones and phenyl hydrazine hydrochloride are present along with acetic acid and sodium acetate. as depicted in scheme (4-6).

2. Result & Discussion

Various techniques for preparing the pyrazoline class of chemicals have been documented. The most widely used method for producing pyrazolines was the reaction of α, β-unsaturated aldehydes and ketones with phenyl hydrazine in acetic acid under reflux conditions, following the groundbreaking work of Fischer and Knoevengel in the 19th century [14]. The reaction between chalcones and phenyl hydrazine hydrochloride in the presence of sodium hydroxide was described by Powers et al. [15] in 1998. The reaction was conducted in 100% ethanol at 70˚C; however, there are drawbacks, including a prolonged reaction time (8 h).

In 2005, it was reported that phenyl hydrazine and chloro chalcones reacted in acetic acid under reflux conditions for three hours to produce 3,5-diaryl-2-pyra-zolines. The yield of 1,3,5-triphenyl pyrazoline was very low when the molar ratio of phenyl hydrazine hydrochloride and chalcones 3 was 1:1. However, the yield of products was also boosted by raising the molar ratio to 1:2 and 1:3. The release of phenyl hydrazine from phenyl hydrazine hydrochloride may be facilitated by sodium acetate [14].

So reaction condition we chose were the molar ratio of chalcone: phenyl hydrazine: sodium acetate was 1:2:0.15. Chalcone was reacted with phenyl hydrazine hydrochloride or hydrazine hydrate by refluxing at 210˚C; the yield of pyrazoline was between 52% and 75% (Table 1). Chalcone (3 mmol), phenyl hydrazine hydrochloride (6 mmol), and sodium acetate (0.3 mmol) were determined to be the ideal reaction conditions based on the results. A number of investigations for the synthesis of pyridazin-3(2H)-one derivatives were carried out using this reaction system.

Chalcone was first made by refluxing 3,6-dichloro pyridazine with 4-amino acetophenone in ethanol for four hours. A novel ketone, 6-[(4-acetylphenyl) amino] pyridazin-3(2H)-one, was created upon oxidation in the AR grade acetic acid solvent. It reacts with various aldehydes to form equivalent chalcones for the pyrazoline molecule.

3.Experimental

The compound's purity was assessed using thin layer chromatography (TLC) plates (silica gel) in the solvent system n-hexane–ethyl acetate 4:6, and the spots were found in an

iodine chamber. Melting points were calculated using the open tube capillary method and are uncorrected.

General procedure:

1. 1-{4-[(6-chloropyridazin-3-yl) amino] phenyl} ethenone

After condensing 0.01 mole of 3,6 di chloro pyridazine and 4-amino acetophenone in ethanol solvent for four hours, the reaction mixture is dumped into ice-cold water. The resulting solid product is filtered, dried under an infrared lamp, and then recrystallized using ethanol solvent.

2. 6-[(4-acetylphenyl) amino] pyridazin-3(2*H*)-one

ns the first step's product after four hours of reflux. The oxidized product was put into ice-cold water in glacial acetic acid solvent, filtered, and recrystallized in ethanol solvent.

3. 6-({4-[(2*E*)-3-phenylprop-2-enoyl] phenyl} amino) pyridazin-3(2*H*)-one

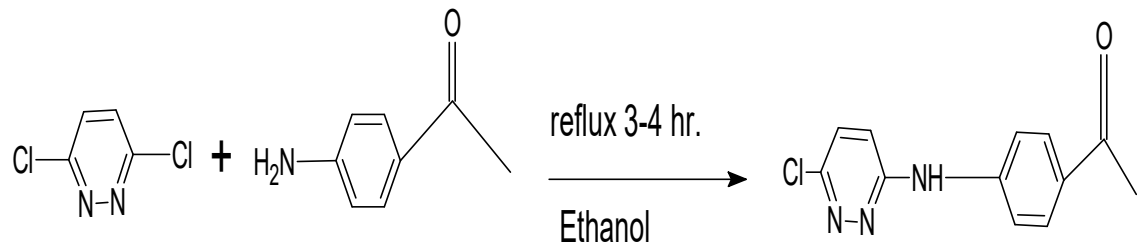
After adding 0.001 mole of 6-[(4-acetylphenyl) amino] pyridazin-3(2H)-one and 0.001 mole of benzaldehyde to 7 milliliters of ethanol and 10% sodium hydroxide, the mixture is neutralized with 2N HCl, poured into ice-cold water, filtered, and recrystallized in ethanol.

4. 6-{[4-(1,5-diphenyl-1*H*-pyrazol-3-yl) phenyl] amino} pyridazin-3(2*H*)-one

0.0005 mole of 6-({4-[(2*E*)-3-phenylprop-2-enoyl]phenyl}amino)pyridazin-3(2*H*)-one and 0.001 mole of phenyl hydrazine in the solvent of 10ml glacial acetic acid and pinch off sodium acetate is added and the reaction mixture is reflux for 3.30 min then the formed product is mixed in ice cold water the solid obtained is filtered through suction pump and dried by using IR lamp and recrystallised in the solvent of ethanol

Present Work:

Scheme -1.



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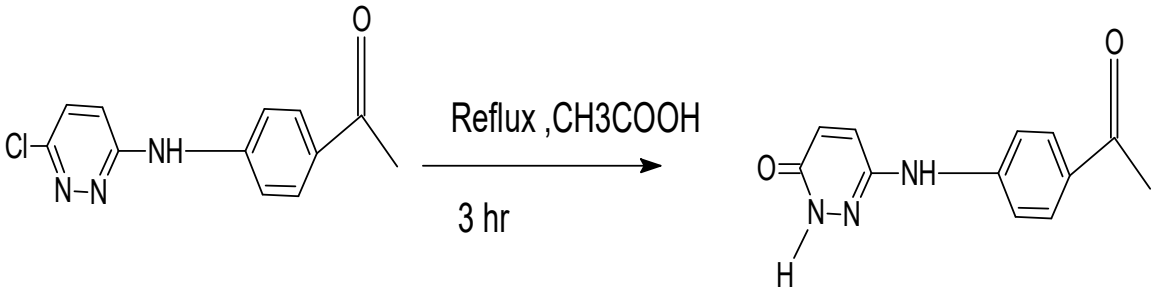
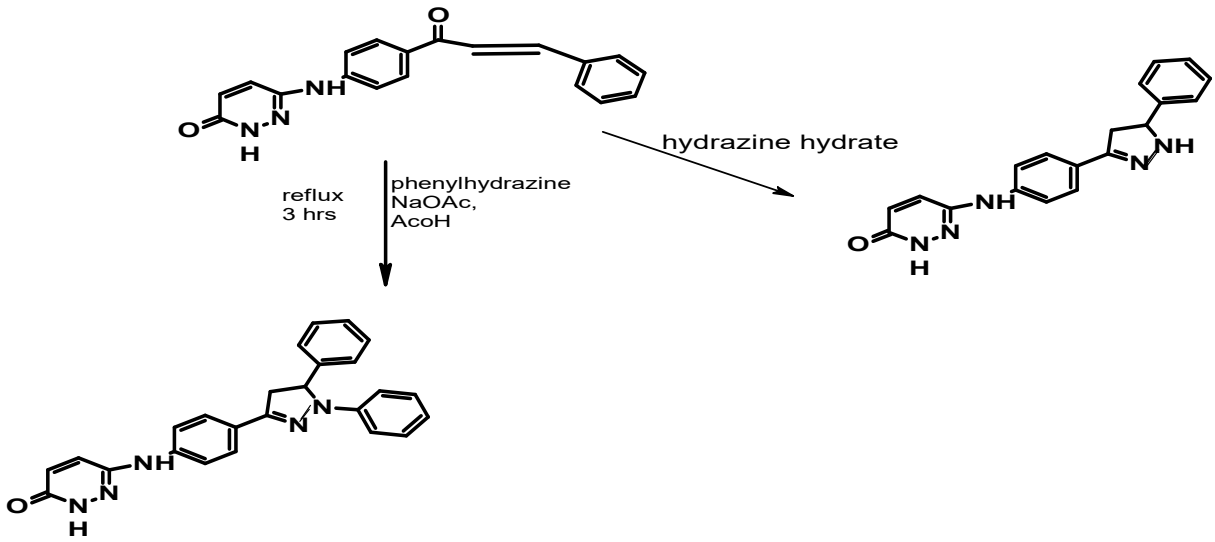
Scheme-2.



Scheme- 3.



Scheme-4

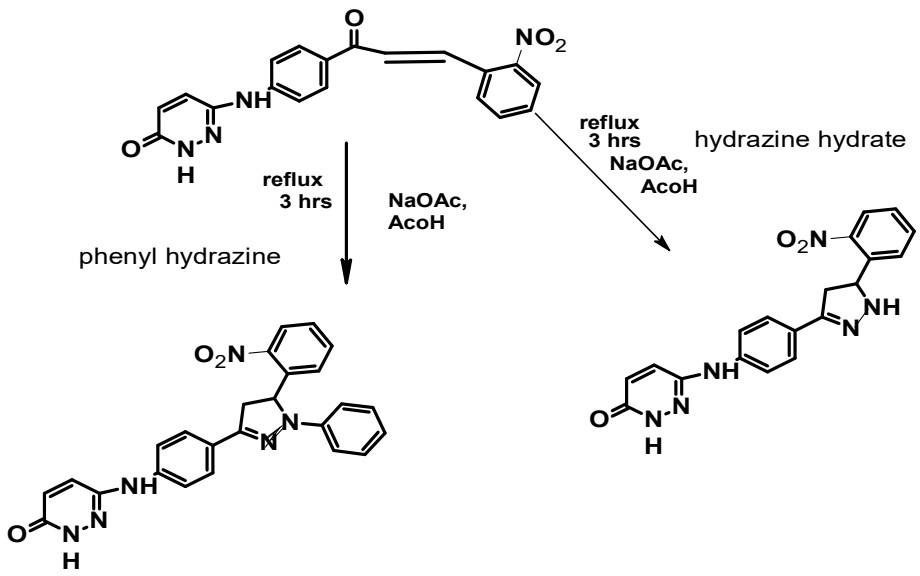
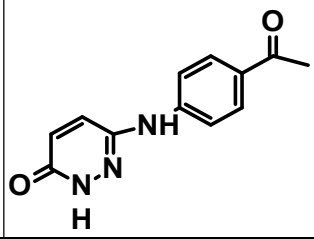
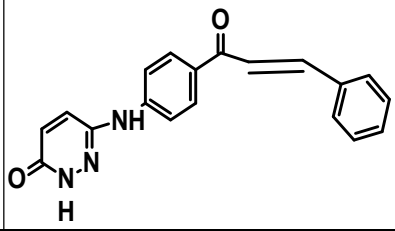
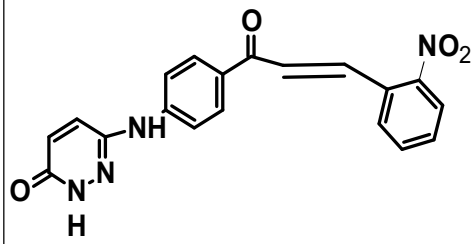
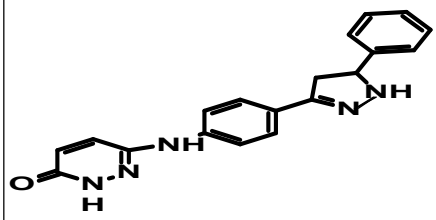
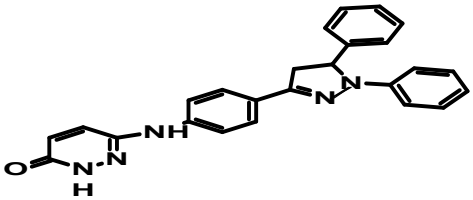
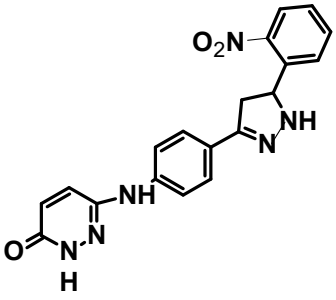
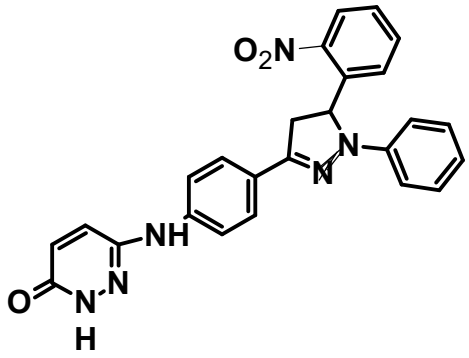
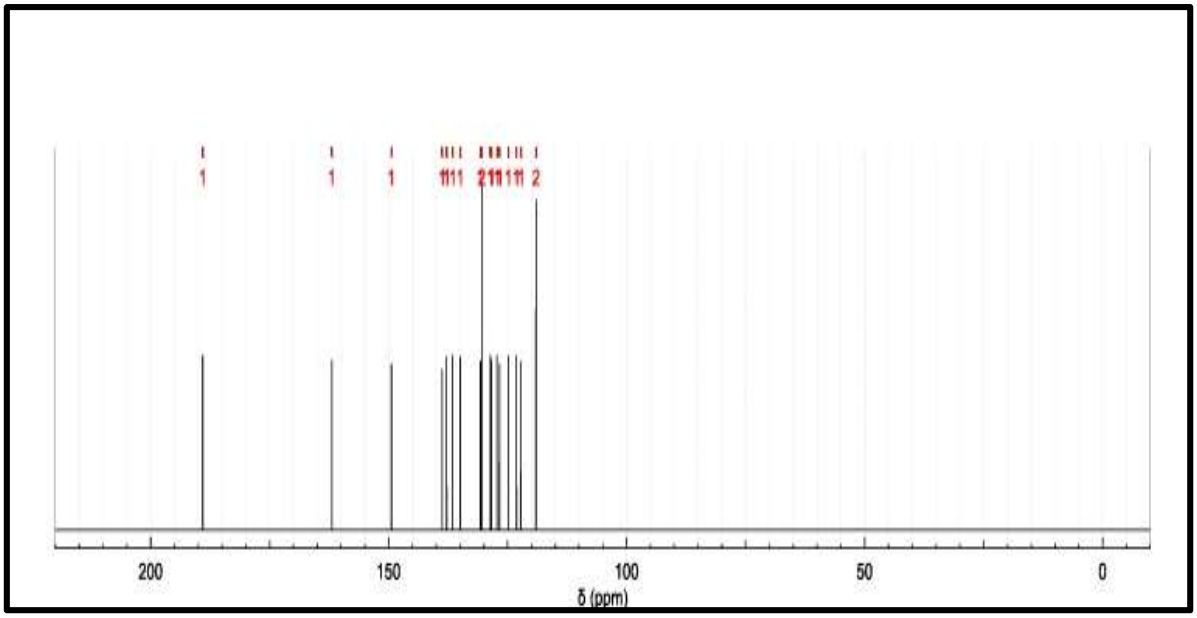


Table 1. synthesised various compounds.

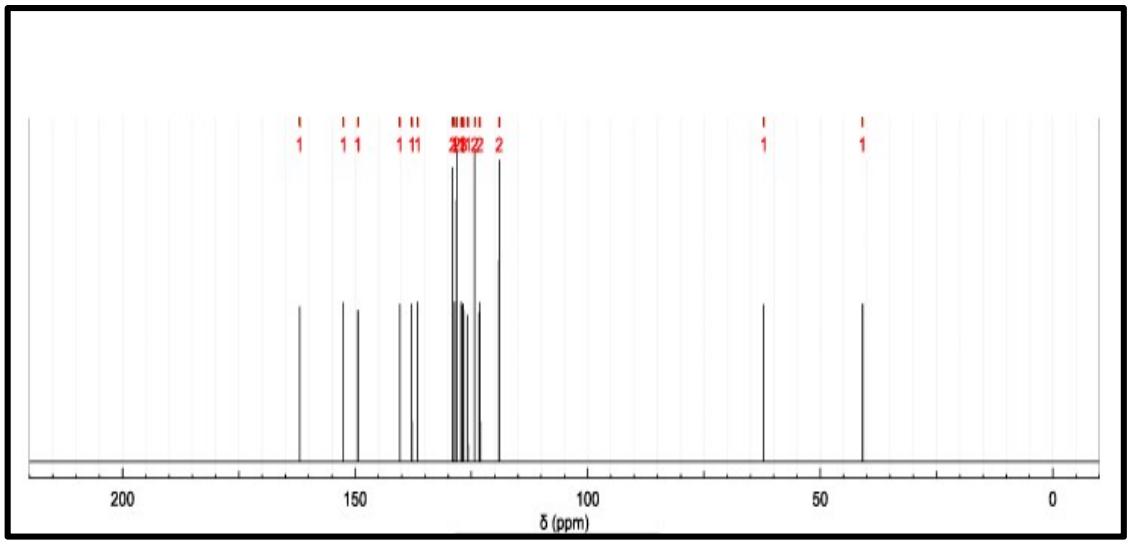
Sr.no.	Product	M. P.	Yield
1)		350 ^{0}C	68%
2)		180 ^{0}C	76%
3)		358 ^{0}C	55%
4)		158 ^{0}C	55 %
5)		170 ^{0}C	66%
6)		220 ^{0}C	52%

7)		202 ^{0}C	58%

Compound(3) : Yield 55%, M. P. 358˚C ; ^{13}C NMR: δ 119.0 (2C, s), 122.2(1C, s), 123.2 (1C, s), 124.9 (1C, s), 126.7 (1C, s), 127.2 (1C, s), 128.4 (1C, s), 128.6 (1C, s), 130.4 (2C, s), 130.7 (1C, s), 134.9 (1C, s), 136.5 (1C, s), 137.8 (1C, s), 138.7(1C, s), 149.4 (1C, s), 161.9 (1C, s), 189.0 (1C, s),



Compound(5) : Yield 66%, M. P. 170˚C ; ^{13}C NMR: δ 40.9 (1C, s), 62.1 (1C, s), 119.0 (2C, s), 123.1-123.3 (2C, 123.2 (s), 123.3(s), 124.3 (2C, s), 125.7 (1C, s), 126.6-126.8 (3C,126.7 (s), 126.7 (s), 126.8 (s), 127.0 (1C, s), 127.2 (1C, s), 128.2 (2C, s), 128.6 (1C, s), 129.0 (2C, s), 136.5(1C, s), 137.8 (1C, s), 140.4 (1C, s), 149.4 (1C, s), 152.5 (1C, s), 161.9 (1C, s),



Conclusion.

In conclusion I have synthesised 1,3,5-Triphenyl-1H-pyrazoles containing 6-aminopyridazin-3(2H)-one derivatives from newly prepared acetophenone yield obtained in all the steps in this transformation are satisfactory and it has significant medicinal importance

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