World Journal of Pharmaceutical Science and Research
www.wjpsronline.com
Research Article
ISSN: 2583-6579
SJIF Impact Factor: 3.454
Year - 2023
Volume: 2; Issue: 6
Page: 243-253

SYNTHESIS AND IN VITRO ANTHELMINTIC ACTIVITY OF {3-[2-(5,6-DICHLORO-1H-BENZIMIDAZOL-2-YL)-2-OXOETHYL] PHENYL}ACETIC ACID AND ITS DERIVATIVES

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Article Received: 03 October 2023 || ***Article Revised: 24 October 2023*** || ***Article Accepted: 15 November 2023***

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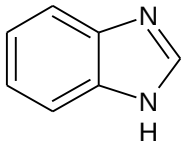
ABSTRACT

Introduction: The 6-membered benzene bonded to the five-membered imidazole molecule is the primary structural member of the benzimidazole group of heterocyclic, aromatic chemicals. The utilisation of substances with benzimidazole motifs in pharmaceutical and scientific research has showed potential. The goal of the study was to evaluate the pharmacological effects of synthetic compounds. For its anthelmintic characteristics, of AD derivatives were studied. This study set out to assess the pharmacological potency of synthesised drugs. The primary goal of this study is to create biodegradable benzimidazole derivatives by using catalyst. Benzoglyoxalines was also known as benzimidazoles. **Methods:** The structure confirmations of synthesized compounds were done by FTIR, NMR spectroscopy and MS. **Results:** According to the data, Al and AK give notable anthelmintic activity when compared to conventional medications like Albendazole. **Conclusion:** The in vitro anthelmintic activity of the title compounds and its derivatives was studied. Table 1 displays the findings of the produced compounds' initial in vitro anthelmintic activity testing.

KEYWORDS: Benzimidazole; Glycolic Acid; Benzene-1, 2-diol; 2- Nitro Aniline; Anthelmintic activity; Albendazole.

INTRODUCTION

In 1944, benzimidazole nucleus was found. It possesses a fused benzene and imidazole ring. Purine and its structure were analogous of each other.[1] Benzimidazole possesses a substantial heterocyclic nucleus as a result of the variety of therapeutic uses it has. The chemist Hoebrecker invented the first benzimidazole in 1872.[2] The hydrogen atom in benzimidazoles was bonded to N at position one (see Fig. 1). Today, benzimidazole is a preferred moiety due to its wide range of pharmacological traits.



1*H*-benzimidazole

Fig. 1: Benzimidazole heterocyclic nucleus.

Benzoglyoxalines was also known as benzimidazoles. Conjugated benzimidazole derivatives appear to be an essential scaffold for anti-parasitic, anti-anthelmintic pharmacological medicines. Blocking the creation of reactive oxygen molecules, directly or indirectly eliminating free radicals, and changing the intracellular redox potential are also addressed. Because oxidative stress is thought to trigger apoptosis, antioxidants demonstrate their effectiveness by lowering it. The worms can enter the human body as larvae or eggs through a variety of routes, including direct touch, contaminated food, mosquitoes (which carry filarial worms), the ground, and water. Helminthiasis causes a variety of illnesses that are exceedingly hazardous to both humans and animals. There are numerous anthelmintic medications on the market that can kill and sicken all parasitic insects in the host body that is suffering. In addition, typical anthelmintic drugs, like as Albendazole, can induce gastrointestinal irritation, migraines, nausea, dizziness, and hair loss in humans. The lack of a reliable anthelmintic vaccination further complicates matters. As a result, developing novel anthelmintic chemicals that can be used to combat this problem is critical. The vast majority of drugs used in healthcare settings are synthetic and have molecular architectures that include heterocyclic rings. As a result, many researchers have been working on antiepileptic compounds in recent years. The primary intent of this study is to utilise a catalyst to produce sustainable benzimidazole derivatives. The presence of aryl/alkyl compounds such as phenyl [C6H5], ethyl [C2H5], and methyl [CH3] as well as electron donor compounds was necessary for the Anthelmintic efficacy of various derivatives products.[11]

MATERIALS AND METHODS

Materials

Several compounds were utilised in the manufacture of benzimidazole derivatives, including Acetyl Chloride; 5,6-dichloro-1H-benzimidazole; 2-Nitro Aniline; 3- Nitro Aniline etc. Research grade reagents were used altogether. Throughout, analytical grade compounds were employed. Some chemicals were all bought from Modern Chemicals in Aurangabad.

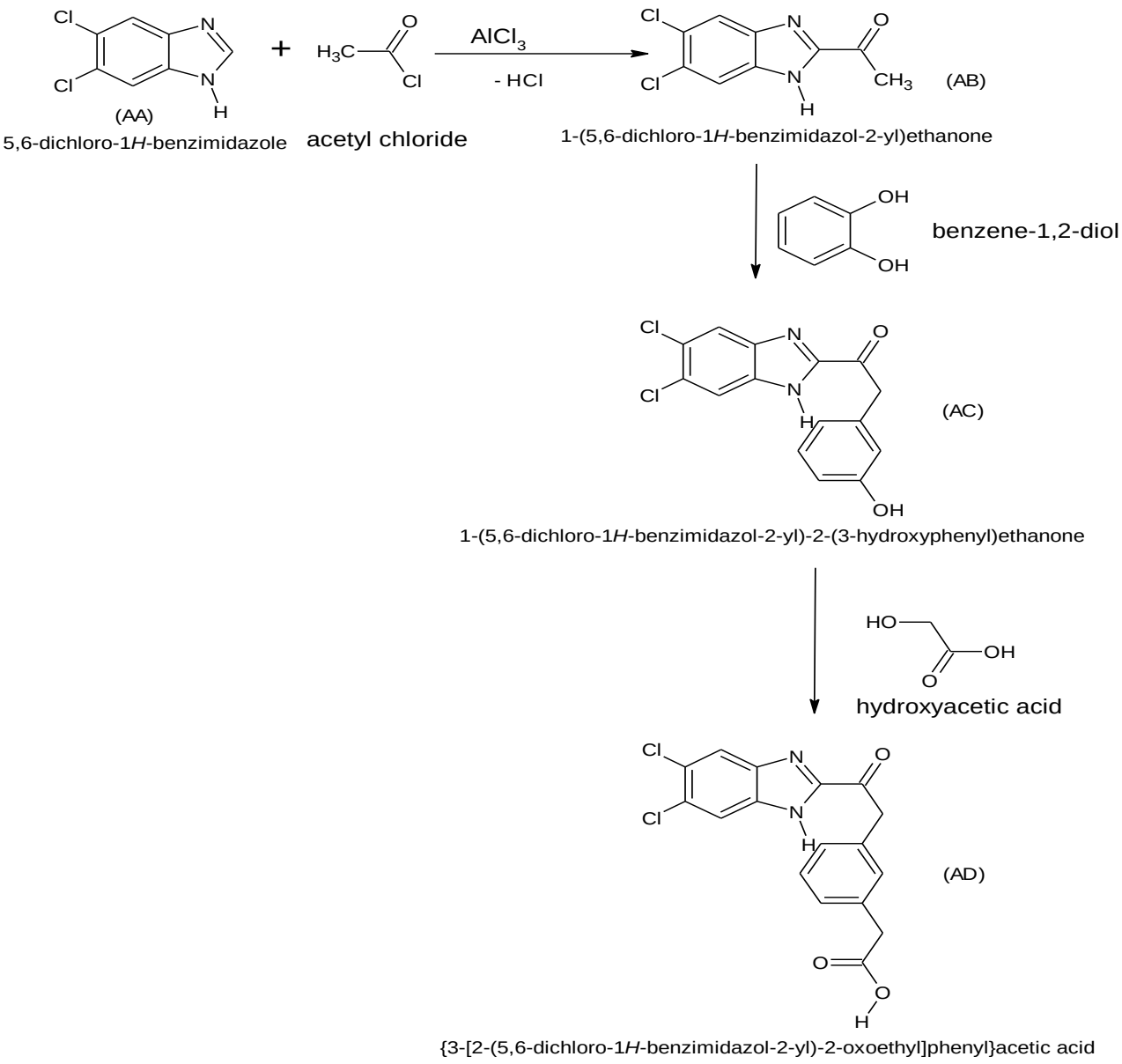
Methods

Every benzimidazole derivative was created using traditional methods. The open tube capillary method was used to determine melting point. Thin-layer chromatography (TLC) was used to determine the purity of the compounds. IR

spectra were collected by using FTIR, or Fourier-transform infrared spectroscopy instrument, 1 H-NMR spectra or nuclear magnetic resonance spectroscopy was recorded.

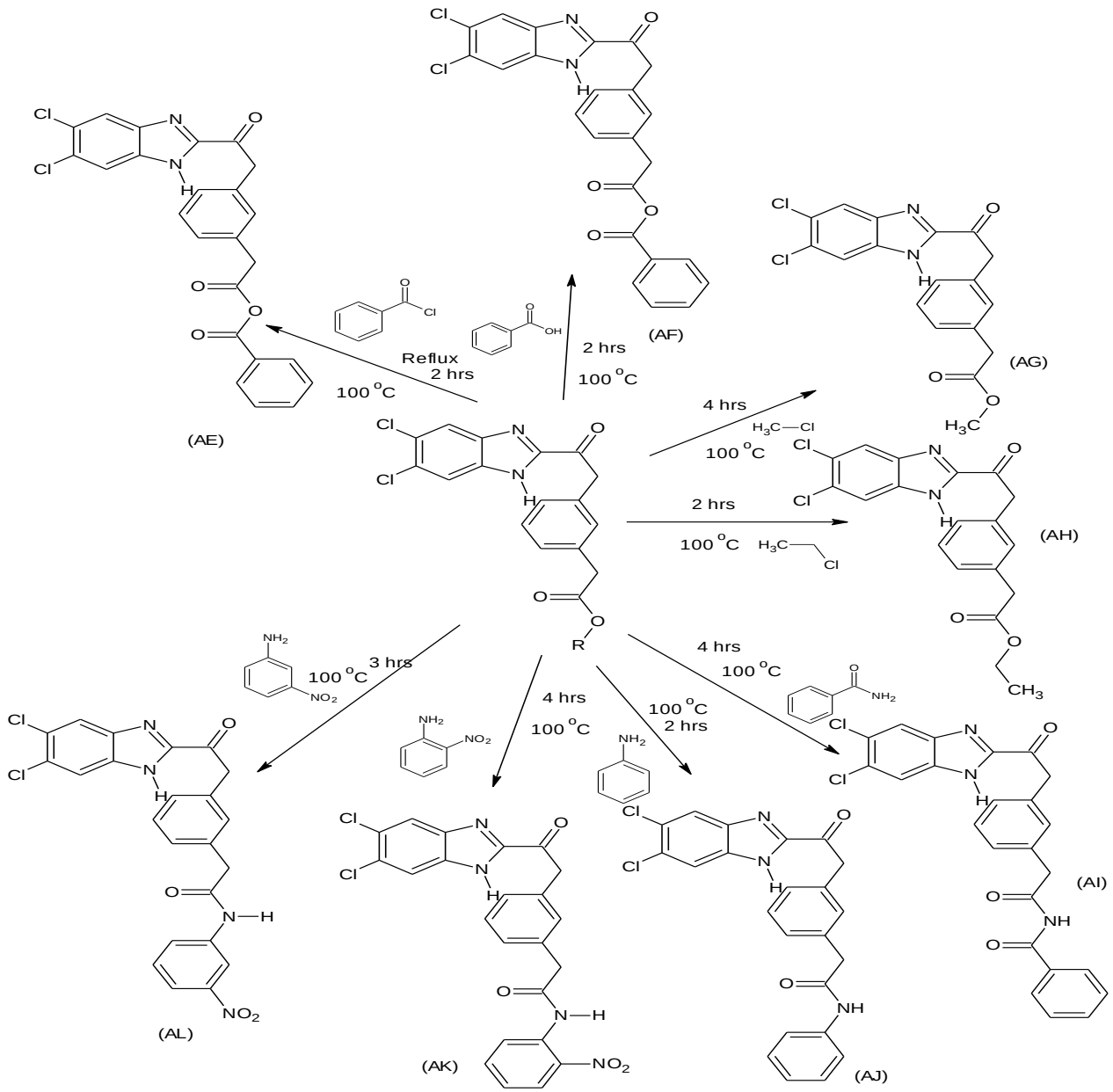
EXPERIMENTAL WORK

Chemistry: (Scheme IA)



Scheme 1A: Synthesis of {3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl]phenyl}acetic acid (AD).

(Scheme IB):



Scheme 1B: Synthesis of {3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl]phenyl}acetic acid (AE- AL) Derivatives.

Synthesis of Benzimidazole Derivatives

Synthesis of 1-(5,6-dichloro-1H-benzimidazol-2-yl) ethanone (AB) : (Scheme 1A)

2 grammes of 5,6-dichloro-1H-benzimidazole (AA) and 2 millilitres of acetyl chloride were incorporated in RBF and heated under rebound conditions for two hours until the reaction was complete (confirmed by TLC).The mixture's components were allowed to cool once the reaction was ended, and the solid that resulted from cooling was filtered before being crystallised again from methanol to produce AB.

Synthesis of 1-(5,6-dichloro-1H-benzimidazol-2-yl)-2-(3-hydroxyphenyl)ethanone (AC): (Scheme 1A)

2 grammes each of AB and benzene-1,2-diol should be placed in a flask with a circular bottom. The solution must be heated under controlled circumstances for four hours in order to verify that the reaction has finished. The mixture's

components were allowed to cool once the reaction was ended, and the solid that resulted from it was filtered and reconstituted from methanol to generate AC.

Synthesis of 1-{3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl]phenyl}acetic acid (AD): (Scheme 1A)

Two millilitres of glycolic acid and two grammes of AC should be combined in a flask with a spherical bottom. A reflux of two hours.To ensure that the reaction has completely cooled, TLC was utilised. The contents of the mixture were then allowed to cool when the reaction was ended. AD was created by filtering and recrystallizing the solid that had formed from the methanol.

Synthesis of {3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl] phenyl} acetic benzoic anhydride (AE): (Scheme 1B)

In an oval-bottomed flask, boil 2 grammes of AD and 4 millilitres of benzoyl chloride for 20 minutes. Completion of reactions (which TLC may confirm). The contents of the mixture were allowed to cool once the reaction was finished to produce a solid. In order to create AE, this material was then purified and recrystallized from methanol.

Synthesis of {3-[2-(5,6-dichloro-1H-benzimidazol-2-yl] phenyl} acetic benzoic anhydride (AF): (Scheme 1B)

Two grammes of AD along with one gramme of benzoic acid were mixed in a round-bottomed flask, heated at 100°C under controlled conditions for two hrs until the reaction was finished (verified by TLC). The combination was obtained by allowing the contents to cool once the reaction was finished. After the produced solid had been purified, it was combined with the methanol to produce AF.

Synthesis of methyl {3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl] phenyl} acetate (AG): (Scheme 1B)

A total of two grammes of AD and one gramme of chloromethane were heated in tandem under reflux conditions for four hours. The contents of the combination were then permitted to cool when the reaction had finished. In order to create AG, the resultant solid was purified and crystallised from methanol.

Synthesis of ethyl {3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl]phenyl}acetate (AH): (Scheme 1B)

Two grammes of AD and two grammes of chloroethane were heated in a flask with a round bottom under controlled conditions for two hours. After filtering the resulting solid, AH was created by re-crystallizing it from methanol. After filtering, the product is cooled to room temperature. Use cold water to wash.

Synthesis of *N*-({3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl] phenyl} acetyl) Benzamide (AI): (Scheme 1B)

Take 2 grammes of AD and 4 hours' worth of heated benzamide in a flask with a circular bottom (checked with TLC). The mixture's components were allowed to cool once the reaction was finished, and the resultant solid was filtered and re-crystallized from methanol to produce AI.

Synthesis of 2-{3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl] phenyl}-*N*-phenylacetamide (AJ): (Scheme 1B)

Put two grammes of benzamide and AD together in a flask with a sphere-shaped bottom. Reflux warming was for a total of four hours (TLC tested). The mixture's components were then allowed to cool after the reaction was finished. The resulting product was passed through filters before being recrystallized from solvent to produce AJ.

Synthesis of 2-{3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl] phenyl}-*N*-(2-nitrophenyl) acetamide (AK): (Scheme 1B)

Two grammes of AD were heated under reflux for two hours in a flask with a round bottom. The ingredients were allowed to cool once the reaction process was finished in order to create the reaction mixture. To produce AK, the resultant solid was filtered and then re-crystallized from methanol.

Synthesis of 2-{3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl] phenyl}-*N*-(3-nitrophenyl) acetamide (AL): (Scheme 1B)

Two grammes of AD and three grammes of 3-nitro aniline were heated under reflux for three hours, cooled in the freezer. The mixture's components were then allowed to cool after the reaction was finished. The resulting solid was filtered, and methanol was added to it to create AL.

RESULT

Spectral Data

Synthesis of 1-(5,6-dichloro-1H-benzimidazol-2-yl) ethanone (AB): (Scheme 1 A)

FTIR (KBr) ν cm^{-1} : 3049.91 (C-H Stretch); 2871.13 (C-H Stretch); 1691.16 (C=C); 1192.79 (C-C); 1260.25 (C-N), 3492.81 (N-H), 1720.34 (C=O Ketone); 1H Nuclear magnetic resonance (500 MHz) CDCl3 δ ppm: 11.8 (N-H), 7.7 (Ar C-H), 7.75 (Ar C-H), 7.31 (Ar C-H), 7.10 (Ar C-H), 2.4 (Methyl C-H).

Synthesis of 1-(5,6-dichloro-1H-benzimidazol-2-yl)-2-(3-hydroxyphenyl)ethanone (AC): (Scheme 1 A)

FTIR (KBr) ν $cm^{-1:}$ 3089.97 (C-H Aromatic); 2797.24 (C-H Aliphatic); 1682.95 (C=C Aromatic); 2943.58 (C-C Aromatic); 1642.50 (N-H Aromatic); 1286.30 (C=O ketone); 1710.50 (C-N Aromatic), 3347 (C-OH), 2797 (C-H), 1340 (C-C), 3468 (N-H), 1008 (C-O); 1H Nuclear magnetic resonance (500 MHz) CDCl3 δ ppm: 11.70 (N-H), 11.4 (N-H), 8.21 (Ar C-H), 8.0 (Ar C-H), 7.50 (Ar C-H), 7.30 (Ar C-H), 6.85 (Ar C-H), 7.0 (Ar C-H), 6.5 (Ar C-H), 6.1 (C-H), 5.1 (O-H).

Synthesis of 1-{3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl]phenyl}acetic acid (AD): (Scheme 1 A)

FTIR technique (KBr) ν cm^{-1} : 3050.55 (C-H Aromatic); 2871.13 (C-H Aliphatic); 1627.02 (C=C); 1100.72 (C-C); 3342.72 (N-H); 1340.28 (C-N Ar); 3016.73 (N-H Ar); 1729.98 (C=O ketone); 3527.72; 1193.10(C-O Aliphatic); 1H Nuclear magnetic resonance (500 MHz) CDCl3 δ ppm: 11.7 (N-H), 8.9 (Ar C-H), 8.87 (Ar C-H), 8.70 (Ar C-H), 8.50 (Ar C-H), 8.44 (Ar C-H), 8.30 (Ar C-H), 8.10 (Ar C-H), 8.3 (Ar C-H), 7.4 (C-H), 7.5 (C-H), 7.4, 6.12 (C-H), (C-H), 6.0 (C-H); Mol.Wt. 278.

Synthesis of {3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl] phenyl} acetic benzoic anhydride (AE): (Scheme 1 B)

FTIR (KBr) ν cm^{-1} : 3057.85 (C-H Ar); 2798.23 (C-H Aliphatic); 1677.41 (C=C Ar); 1010.19 (C-C Ar); 1344.00 (C-N Ar); 3352.64 (N-H Ar); 1749.83(C=O Ketone); 1197.70 (C-O); 1H Nuclear magnetic resonance (500 MHz) CDCl3 δ ppm: 11.7 (N-H); 12.0 (N-H); 8.9 (Ar C-H); 8.8 (Ar C-H); 8.7 (Ar C-H); 8.54 (Ar C-H); 8.40 (Ar C-H); 8.35 (Ar C-H); 8.10 (Ar C-H); 8.1(Ar C-H); 7.70(Ar C-H); 7.5 (Ar C-H); 7.4 (Ar C-H); 7.12(Ar C-H); 7.01 (Ar C-H); 6.7 (C-H); 6.4(C-H); Mol. Wt. 398.

Synthesis of {3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl] phenyl} acetic benzoic anhydride (AF): (Scheme 1 B)

FTIR (KBr) ν cm^{-1} : 3051.80 (C-H Ar); 2797.24 (C-H Aliphatic); 1695.12 (C=C Ar); 1178.29 (C-C Ar); 1340.28(C-N Ar); 3460.63(N-H Ar); 1725.88 (C=O)ketone; 1263.60(C-O Aliphatic); acid anhydride 1746.46; 1H Nuclear magnetic resonance (500 MHz) CDCl3 δ ppm: 11.7 (N-H); 11.6 (N-H); 11.3 (N-H); 8.9 (Ar C-H); 8.8 (Ar C-H); 8.7 (Ar C-H); 8.5 (Ar C-H);8.4 (Ar C-H); 8.3 (Ar C-H); 8.1(Ar C-H); 8.0 (Ar C-H); 7.7 (C-H); 7.5 (C-H); 7.3 (Methyl C-H);7.0 (Ar C-H); 7.0 (Ar C-H);6.4 (C-H); Mol.Wt. 338.

Synthesis of methyl {3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl] phenyl} acetate (AG): (Scheme 1 B)

FTIR (KBr) ν cm^{-1} : 2965.53 (C-H Ar); 2871.30(C-H)1698C=C) Aliphatic); 1277 (C=C Ar); 1345.28 (C-C Ar); 3024.73 (N-H Aliphatic); 1721.98(C-N Ar); 1229.16 (N-H Ar); 1H Nuclear magnetic resonance (500 MHz) CDCl3 δ ppm: 12.35 (N-H); 8.1 (Ar C-H); 8.7 (Ar C-H); 7.4 (Ar C-H); 7.5(Ar C-H); 7.4 (Ar C-H); 7.2 (Ar C-H); 7.12(Ar C-H); 6.95 (Ar C-H); 6.4 (Ar C-H); 6.2(C-H); 6.4 (C-H); 2.4 Methyl (C-H); Mol.Wt. 308.

Synthesis of ethyl {3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl]phenyl}acetate (AH): (Scheme 1 B)

FTIR (KBr) ν cm^{-1} : 3067.23(C-H Ar); 2997.80(C-H Aliphatic); 1594.84 (C=C Ar); 1201.43 (C-C Ar); 1270.40 (C-N Ar); 3295.50(N-H Ar);1695.12 (C=O) ketone; 1000.87 (C-O); 1H Nuclear magnetic resonance (500 MHz) CDCl3 δ ppm: 11.5 (N-H); 8.6 Ar C-H); 8.5(Ar C-H); 8.4 (Ar C-H); 8.2(Ar C-H); 8.1 (Ar C-H); 7.8 (Ar C-H); 7.7 (Ar C-H); 7.2(Ar C-H); 6.6 (Ar C-H); 6.4 (Ar C-H); 6.2 (Ar C-H); 3.0 (Ar C-H); Mol.Wt. 322.

Synthesis of *N*-({3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl] phenyl} acetyl) Benzamide (AI): (Scheme 1 B)

FTIR (KBr) ν cm^{-1} : 3005.52 (C-H Ar); 2997.80 (C-H); 1594.84 (C=C Ar); 1201.43(C-C Ar); 3098.08 (C-N); 1334.27 (N-H Ar); 3410.59 (N-H),1701(C=O),1268.57(C-O),3322.64(N-H); 1H Nuclear magnetic resonance (500 MHz) CDCl3 δ ppm: 12.1 (N-H); 11.4 (N-H), 9.0(Ar C-H); 9.12 (Ar C-H); 9.4(Ar C-H); 8.9 (Ar C-H); 8.7(Ar C-H); 8.6 (Ar C-H); 8.2(Ar C-H); 8.1 (Ar C-H); 7.9 (Ar C-H); 7.7 (Ar C-H); 7.3 (Ar C-H); 7.1 (C-H); 7.0 (C-H);6.4(C-H);6.7(C-H); Mol.Wt. 397.

Synthesis of 2-{3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl] phenyl}-*N*-phenylacetamide (AJ): (Scheme 1 B)

FTIR (KBr) ν cm^{-1} : 3078.98 (C-H Stretch Aromatic); 2967.50 (C-H Aliphatic); 1664.98(C=C Ar); 1142.72 (C-C Ar); 3086.24(N-H Al); 1341.28 (C-N Ar); 3206.98 (N-H Ar); 1712.55 (C=O) ketone; 1277.20 (C-O), 3314.52(N-H); 1H Nuclear magnetic resonance (500 MHz) CDCl3 δ ppm: 11.7 (N-H); 10.8 (N-H); 8.41 (Ar C-H); 8.50 (Ar C-H); 8.62 (Ar C-H); 8.5 (Ar C-H); 8.45 (Ar C-H); 8.35 (Ar C-H); 8.20 (Ar C-H); 8.00 (Ar C-H); 7.70 (Ar C-H); 7.40 (Ar C-H); 7.30(Ar C-H); 7.10 (C-H); 7.00 (C-H); 6.30(C-H),6.40(C-H), Mol.Wt. 369.

Synthesis of 2-{3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl] phenyl}-*N*-(2-nitrophenyl) acetamide (AK): (Scheme 1B)

FTIR (KBr) ν cm^{-1} : 2965.53 (C-H Ar); 2882.30(C-H)1698C=C) Aliphatic); 1246 (C=C Ar); 1341.28 (C-C Ar); 3027.73 (N-H Aliphatic); 1733.98 (C-N Ar); 1214.16 (N-H Ar); 1H Nuclear magnetic resonance (500 MHz) CDCl3 δ ppm: 12.10 (N-H); 8.00 (Ar C-H); 8.10 (Ar C-H); 7.80 (Ar C-H); 7.60(Ar C-H); 7.40 (Ar C-H); 7.30 (Ar C-H); 7.20(Ar C-H); 6.90(Ar C-H); 6.70 (Ar C-H); 6.20(C-H); 6.40 (C-H); 2.40 Methyl (C-H); Mol.Wt. 308.

Synthesis of 2-{3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl] phenyl}-*N*-(3-nitrophenyl) acetamide (AL): (Scheme 1B)

FTIR (KBr) ν cm^{-1} : 3050.80 (C-H Ar); 279\85.24 (C-H Aliphatic); 1646.12 (C=C Ar); 1278.29 (C-C Ar); 1342.28(C-N Ar); 3440.63(N-H Ar); 1725.88 (C=O)ketone; 1263.60(C-O Aliphatic); acid anhydride 1756.46; 1H Nuclear magnetic resonance (500 MHz) CDCl3 δ ppm: 11.80 (N-H); 11.60 (N-H); 11.30 (N-H); 8.90 (Ar C-H); 8.80 (Ar C-H); 8.70 (Ar C-H); 8.40 (Ar C-H);8.40 (Ar C-H); 8.30 (Ar C-H); 8.10(Ar C-H); 8.00 (Ar C-H); 7.70 (C-H); 7.50 (C-H); 7.30 (Methyl C-H);7.00 (Ar C-H); 7.00(Ar C-H);6.40 (C-H); Mol.Wt. 338.

Biological evaluation

After being washed using the normal solution, Indian earthworms were collected from moist soil and used for the anthelmintic study. Indian earthworms, measuring 3-5 cm in length and 0.1–0.2 cm in breadth, were used because of their pharmacological and anatomical similarities to the human abdominal roundworm parasites. The synthesized compounds were prepared by using the 5% Methanol alcoholic solutions.

In vitro anthelmintic activity

The newly synthesised compounds' anthelmintic potency has been evaluated. Eight virtually identical Pheretima posthuma earthworms from the Loni Botanical Garden near college were selected for the current test. Two worm species, Perionyx excavatus and Pheretima posthuma, were tested for their anthelmintic activity against the AE-AL analogues or components at a concentration of 2 mg/mL. To eliminate soil and excrement, earthworms have been captured and cleaned in regular saline water. Synthesised compounds (one hundred milligrammes) were triturated with 0.5 percent Tween 80, normal saline solution, and the corresponding solutions were agitated for 20 minutes to produce sample suspensions. For the test samples, the suspensions of each sample were diluted to a concentration of 0.2 percent w/v. The reference medication albendazole (0.2 percent w/v) suspension was made in the same technique. Five earthworms, each about two inches long, and fifty millilitres of a specimen suspension for testing was placed in Petri plates with a diameter of four inches. For sets of three worms, the times required for paralysis and death were noted, and their means were calculated. After each measurement was done in triplicate, the mean paralysis time and mean fatal time for each sample were calculated (Table No. 1).

Table 1: Anthelmintic Activity Data of {3-[2-(5,6-dichloro-1H-benzimidazol-2-yl)-2-oxoethyl]phenyl}acetic acid (AE- AL) Derivatives.

Compounds Code	Earthworm species			
	Perionyx excavatus		Pheretima posthuma	
AE	14.33±0.98	24.54±1.48	34.41±0.66	28.7±0.2
AF	20.50±0.71	28.65±0.54	20.43±0.21	27.29±0.22
AG	29.15±0.76	37.54±0.98	16.32±0.6	15.4±0.82
AH	14.33±0.98	24.54±0.48	34.41±2.66	28.7±1.2
AJ	24.11±0.5	24.65±0.12	39.23±3.65	30.86±2.65
AI	28.35±0.16	20.35±0.86	33.23±0.61	34.53±0.43
AK	30.22±0.12	37.17±0.76	33.16±0.32	38.10±0.22
AL	34.35±0.16	31.35±1.86	30.23±0.61	31.53±0.43
Albendazole	10.13±0.69	15.72±0.52	11.53±0.85	17.92±0.59
Control	------	-------	--------	-------

DISCUSSION

Tests have been done on the newly developed compounds to see how well they killed helminthes, or worms. Helminthes or worms frequently result in parasitic issues. Anthelmintic treatments eliminate the worms from the infected host body, however due to their widespread use, a resistance has emerged, necessitating the creation of secure and efficient anthelmintic pharmaceuticals. Indian earthworms Pheretima posthuma and Perionyx excavatus were used to investigate the anthelmintic action of the synthesised medicines due to their physical and physiological resemblance to human intestinal roundworm parasites. The benzimidazole derivatives showed moderate to good anthelmintic efficacy at a dosage of 2 mg/mL. The results showed that all of the examined medications were superior to Perionyx excavatus and Pheretima posthuma in terms of mean paralysis and mean fatal times. For the compounds tested against Perionyx excavatus and Pheretima posthuma, the standard deviation of the mean paralysing time (min) was found to be less than the values of 10.13 and 11.53 minute for novel Benzimidazole derivatives revealed by the reference medicine Albendazole (Table 1). The results were similar to those of the commonly prescribed drug Albendazole. Every single worm was present and active in the control group. Pheretima posthuma and Perionyx excavatus died as a result of albendazole in an average of 17.92 and 15.72 minutes, respectively. It was discovered that the two substances AL and AK were efficient worm killers. Against Perionyx excavatus and Pheretima posthuma, compound AL killed worms in an average of 34.350.16 and 30.230.61 minutes, whereas compound AK killed worms in an average of 30.220.12 minutes and 33.160.32 minutes.

CONCLUSION

Convectional strategy was used for generating a variety of benzimidazole derivatives. We synthesized total 8 benzimidazole derivatives. NMR spectroscopy and MS were performed in the CIF, Savitribai Phule, Pune University, to confirm the structure of combined substances. In this investigation, benzimidazole compounds were found to have stronger anthelmintic activity against a variety of earthworm types. Some of the synthesised compounds were discovered to have powerful anthelmintic effects. When compared to other benzimidazole, aromatic components were shown to be more active. As a result, the compound AL and AK gives strong anti convulsant effects against Albendazole drug.

ACKNOWLEDGEMENT

The authors are thankful to Dr. S.B. Bhawar, Pravara Rural College of Pharmacy, Pravaranagar.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ABBREVIATIONS

FTIR: Fourier transform infrared spectroscopy; NMR spectroscopy: Nuclear magnetic spectroscopy; MS: Mass spectroscopy; KBr: Potassium Bromide; % yield: Percentage yields; M.P.: Melting point; mg/kg: Milligram/ kilograms; sec: seconds; δ: Chemical shift; Mol. Wt: Molecular Weight; gm: Gram.

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