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Graphical abstract

Paper-1	Heterocyclic Letters 13: iss.-4 (2023), 679-689

In *silico* studies on N-amide derivatives of indole-benzimidazole-isoxazole for biological activity

Karuna Chepyala[1], Venkata Ramana Reddy Chittireddy[1,2]* and Laxminarayana Eppakayala[2]

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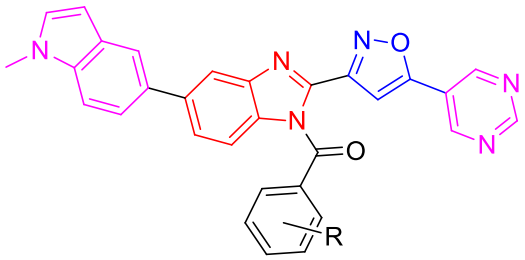
[*]E-Mail: vrr.chittireddy@gmail.com

The molecular docking studies of new library of amide derivatives of Indole-benzimidazole-Isoxazole were performed for and have shown prominent binding affinity.



Paper-2	Heterocyclic Letters 13: iss.-4 (2023), 691-696

Syntheses and antimicrobial activity of substituted pyrazino pyrimido pyrimido benzothiazole

Digambar B. Kadam[a]*, Sandeep G. Sontakke[b], Avinash V. Pawde[c], Sambhaji P. Vartale[d]**

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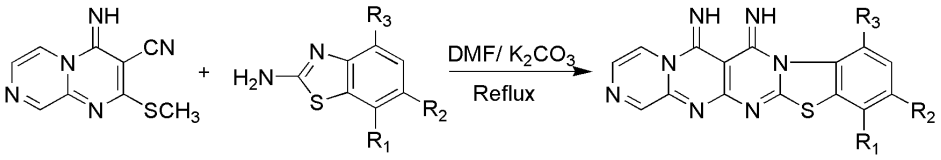
Synthesis of structurally different libraries of 7,8-diimino pyrazino[1,2-a]pyrimido[4,5-d]pyrimido[2,1-b]benzothiazole compounds have been reported by condensation of 3-cyano-4-imino-2-(methylthio)-4H-pyrimido[1,2-a]pyrazine with substituted 2-amino benzothiazole. Anti-microbial activities were evaluated for all the synthesized compounds.



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Paper-3 | Heterocyclic Letters 13: iss.-4 (2023), 697-700

Pyrazole Based Green Synthesis of Schiff's base

Mustaqeem Mohammed Abbas*, Jatin Nilesh Kerkar, Julian James Ma, Saransh Shivprasad Kanojia

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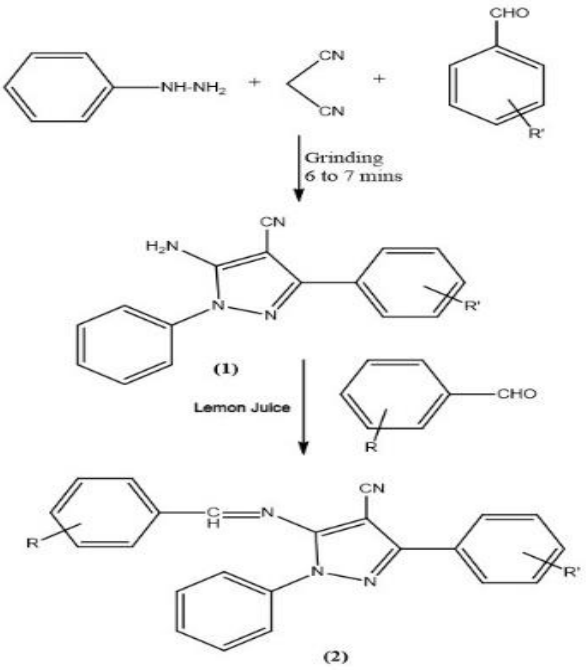
A series of pyrazoles containing Schiff's base have been synthesized by grinding free amino pyrazole with aromatic aldehyde in the presence of fresh lemon juice as a catalyst. The comparative studies were done with respect to yield, reaction simplicity, and work-up. The structures of all the synthesized products were confirmed by chemical tests including TLC, other physical parameters such as melting, boiling point, and spectral technique such as IR, ^{1}H NMR and ^{13}C NMR.



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Paper-4	Heterocyclic Letters 13: iss.-4 (2023), 701-707

Synthesis, spectral characterization and antibacterial studies of Schiff bases derived from sulpha drugs

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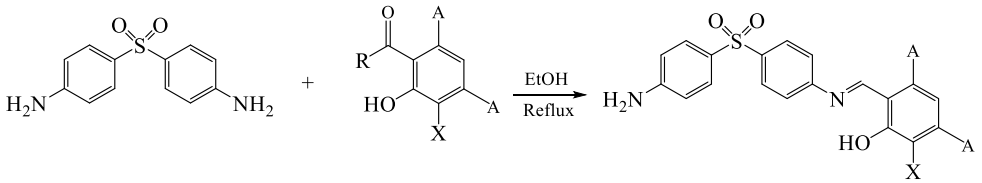
[b]*Department of Chemistry, Shri Shivaji Science College, Amravati, India*
Corresponding authors email: vasadafale1980@gmail.com



X= -OCH_3, A= -OH, R= C_6H_5

Scheme-I

Paper-5	Heterocyclic Letters 13: iss.-4 (2023), 709-714

Waste Curd Water catalysed synthesis of benzimidazole derivatives : A green approach

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[b]*Department of Chemistry, Vivekanand Education Society's College of Arts, Science and Commerce (Autonomous), Sindhi Society, Chembur, Mumbai. India*
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[d]*Department of Chemistry, RamnarainRuia Autonomous College, L. N. Road, Matunga, Mumbai. India*
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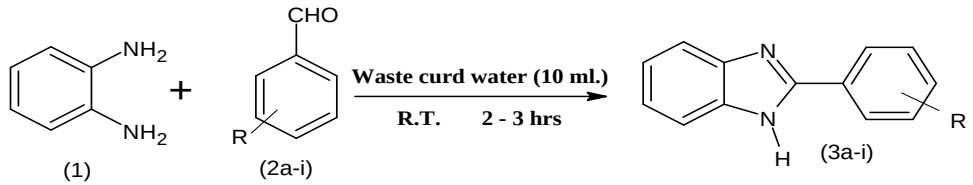
The simple, novel and efficient green approach for the synthesis of 2-Substituted benzimidazole derivatives developed using waste curd water as a greener solvent cum biocatalyst. The condensation reaction catalyzed by Waste Curd Water (WCW) was stirred for 2-3 hrs. at room temp.



Scheme -1

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Paper-6 | Heterocyclic Letters 13: iss.-4 (2023), 715-728

Synthesis and antioxidant evaluation with *in silico* studies of quinone hydrazones

Dhangapure Rohit[a], Harnekar Fahad[a], Kulkarni Prafull[a], Shilimkar Suyash[a], Tambe Pranav[b], Khursheed Ahmed[a] and Pangal Anees[a]*

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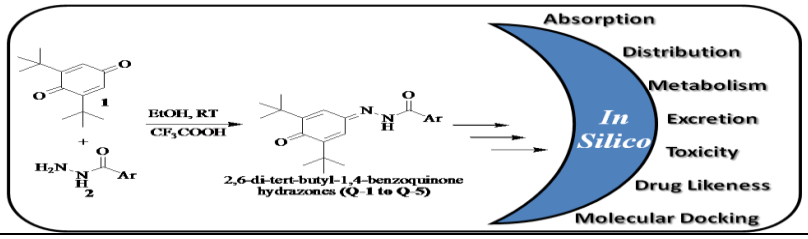
In the present study, we report the synthesis, structural characterization and antioxidant activity of biologically active hydrazones **Q-1 to Q-5** from 2,6-di-tert-butyl-1,4-benzoquinone and hetero aromatic hydrazides. The hydrazone, **Q-2** shows a notable antioxidant potential of 9.09 ± 0.48 µg/ml as compared to ascorbic acid. All the derivatives were screened virtually for ADMET, physicochemical properties, drug likeness and molecular docking studies. These hydrazones showed good pharmacodynamics and physicochemical properties, as well as no violations in drug-likeness predictions. These compounds were further subjected for possible target prediction and the compounds were found to target enzymes in the biological systems. Further, these compounds were docked in COX-2 (PDB Id: 6COX) protein and found to exhibit reasonably good interactions with amino acid residues, showed a good binding energy and fit favorably into the 6COX active site displaying hydrogen bonding with different amino acid residues of the target protein. The experimental results of the antioxidant activity fit well with the predicted *in silico* results. Therefore, these new derivatives (**Q-1 to Q-5**), containing a quinone and an azomethine group, can become good drug candidate for designing new drug and can be considered for further optimization and lead development.



Paper-7 | Heterocyclic Letters 13: iss.-4 (2023), 729-735

Microwave assisted synthesis of pyrano[2,3-c]pyrazole derivatives under solvent free conditions

Julekha A. Shaikh*

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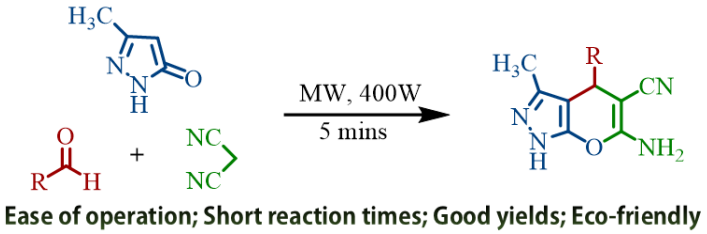
A sustainable route for synthesis of pyrano[2,3-c]pyrazole derivatives using microwave at 400 W for 5 mins has been developed.



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Paper-8 | Heterocyclic Letters 13: iss.-4 (2023), 737-745

Antibacterial activity and related issues of natural dyes in textiles, their effective data analysis

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[b]*Centre for natural products & Traditional knowledge, CSIR-IICT, Tarnaka, Hyderabad,Telangana,India.*
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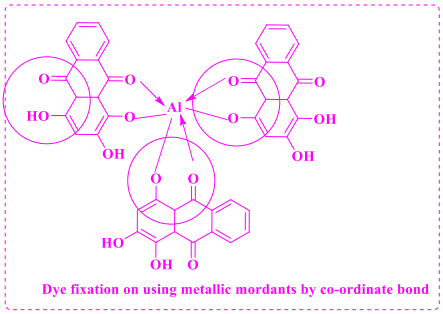
Dyeing textiles with various shades of colors is known to mankind since times immemorial. Indigo and madder root are the most popular natural dyes. Their popularity is relegated after the discovery of azo dyes etc., based on naphthalene anthracene, acridine etc, which were developed as synthetic dyes. Synthetic dyes are hazardous to health and environment and lot of colored effluent is or released into environment. Natural dyes mostly extracted from edible plant sources are safe. A review of some promising plant natural products as dyes, use of metal mordant to fix dyes with textiles and mechanistic approach of mordent dye textile and habitual antibacterial activity are specified in this paper.



Paper-9 | Heterocyclic Letters 13: iss.-4 (2023), 747-757

Design, synthesis and antimicrobial activity of [1,2,4]triazolo[3,4-*b*][1,3,4] thiadiazole derivatives

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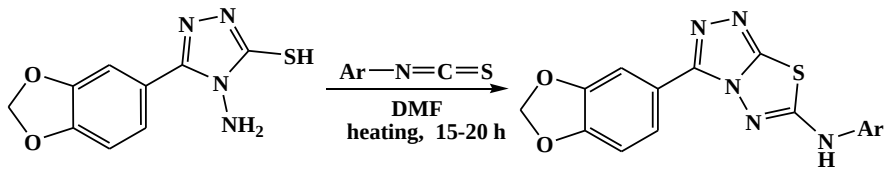
N-[3-(1,3-benzodioxol-5-yl)[1,2,4]tri-azolo[3,4-*b*][1,3,4]thiadiazol-6-yl]-*N*-aryl/alkylamine derivatives 6 a-e has been synthesized by the reaction of 4-amino-5(1,3-benzodioxol-5-yl)-4*H*-1,2,4-triazole-3-ylhydrosul-fide.



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Paper-10	Heterocyclic Letters 13: iss.-4 (2023), 759-773

Synergistically doped fly ash catalyst is highly effective in the synthesis of xanthene derivatives.

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[b] *Department of Chemistry, Kalikadevi Arts Commerce and Science College Shirur (kasar), Beed 413249, Maharshtra India.*
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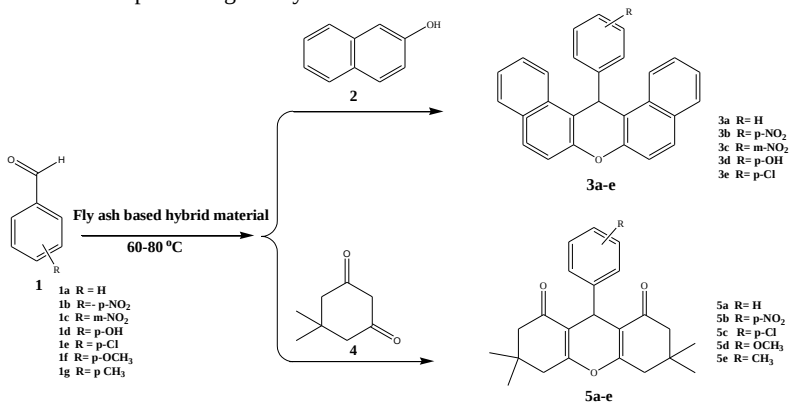
**Corresponding author: Tel. +91 02428 222736, fax: +91 02428 223033;*
E–mail address: abg_chem@ymail.com (A.B. Gambhire)

Fly ash-based hybrid materials are synthesized by doping 1-9 wt. % of boric acid in the presence of 0.5M sulfuric acid using the co-precipitation method. The synthesized materials were characterized using XRD, FT-IR, and SEM-EDS. In this study, several methods were employed to create catalytic active sites on the inert surface of fly ash, and the efficiency of these methods was evaluated through the one-pot synthesis of biologically active 1,8-dioxo-octahydroxanthene and 14*H*-dibenzo[a,j] xanthene derivatives. The condensation reaction between aromatic aldehydes and either dimedone or β-naphthol was conducted at a temperature range of 60-80ºC for a duration of 10-20 minutes. The highest level of catalytic activity was observed when using a 5 wt. % H_3BO_3/fly ash. The selected synthesis approach is highly efficient, producing excellent yields in a short period of time. These features make it an attractive option for green synthesis.



Paper-11	Heterocyclic Letters 13: iss.-4 (2023), 775-779

Synthesis and Characterization of E/Z-4,5-Dihydro spiro [3-Phenyl-5-Substituted phenyl isoxazole-4,4'(2',4'-Dihydro-5'-Methyl-2'-Phenyl/Phenylmethyl-3'H-Pyrazol-3'-ones)]

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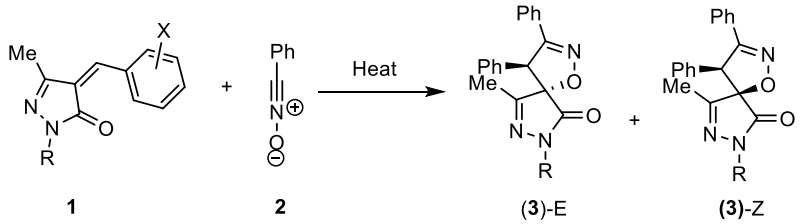
4-Arylmethylene-2,4-dihydro-2,5-disubstituted-3H-pyrazol-3-ones (1a-f; as dipolarophile) react with benzonitrile oxide(2; as 1-3 dipole) to yield E/Z-4,5-dihydro spiro-[3-phenyl-5-substituted phenyl isoxazole-4 ,4'(2',4'-dihydro-5'-methyl-2'-phenyl/phenyl methyl-3'H-pyrazol-3'-ones)].



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Paper-12 | Heterocyclic Letters 13: iss.-4 (2023), 781-788

Solvent Free Green Multicomponent Synthesis Of Pyrazole With Ceria Doped Copper Nano Catalyst

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[b,c,d,e] *Research Scholars, department Of Chemistry, C.K. Thakur College, Affilated To University Of Mumbai, (Autonomous), New Panvel, 410206, Plot No 1, Sector 11, Maharashtra, India.*
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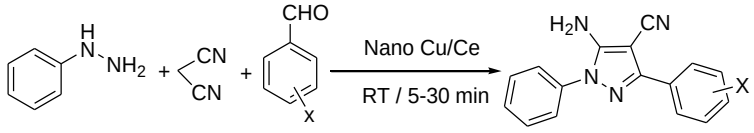
An efficient, green and facile method for the synthesis of pyrazole derivatives by the reaction of aldehyde, malano nitrile and phenyl hydrazine was developed using Ce-Doped Cu nano catalyst. This reusable nano catalyst efficiently catalyzed the synthesis of Pyrazole derivatives. The eco-friendly, environmentally-benign, multi component solvent free reactions occur at room temp in very short period of time. The catalyst and some selected derivative were characterized by various instrumental techniques including IR,NMR, XRD.



X= -NO_2 /-Cl / -OH etc

Scheme I general syntheis of pyrazole

Paper-13 | Heterocyclic Letters 13: iss.-4 (2023), 789-795

Ultrasound based synthesis of substituted 2-amino-4-phenyl-4*h*-benzo[g]chromene-3-carbonitrile by using morpholine as a catalyst

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[b]*Pramukh Swami Science and H.D. Patel Arts College Kadi, Mehsana, India*
[c]*Department of Chemistry, M B Patel Science College Anand, S P University, VV Nagar, India*
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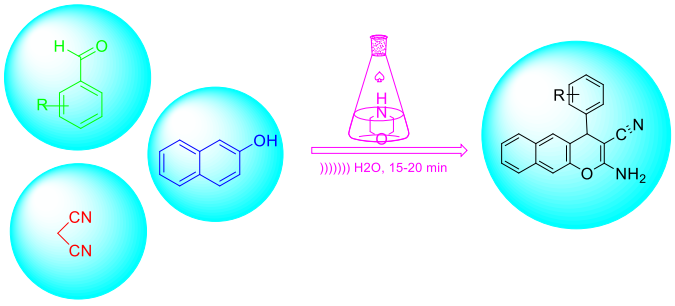
High-intensity ultrasonic irradiation is a more environmentally friendly method of increasing the rate of chemical processes. In terms of cost-effectiveness, high efficiency, low waste, low energy requirements, and outstanding yield, ultrasound sonochemistry is more efficient. This chapter describes an ultrasonic irradiation-catalyzed one-pot multicomponent reaction including morpholine as a catalyst in an aqueous solution with substituted aldehyde, malanonitrile, and -naphthol or -naphthol.



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Paper-14 | Heterocyclic Letters 13: iss.-4 (2023), 797-802

Synthesis of 2-amino-4h-chromene derivatives via three component reaction using sodium benzoate as a green catalyst

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[b]*Department of Chemistry, MSS'S Arts, Science and Commerce College, Ambad, Dist. Jalna- 431 204, Maharashtra, India*
[c]*Department of Chemistry, Shri Dr. R. G. Rathod Arts and Science College, Murtizapur, Dist- Akola-444 107, Maharashtra, India*
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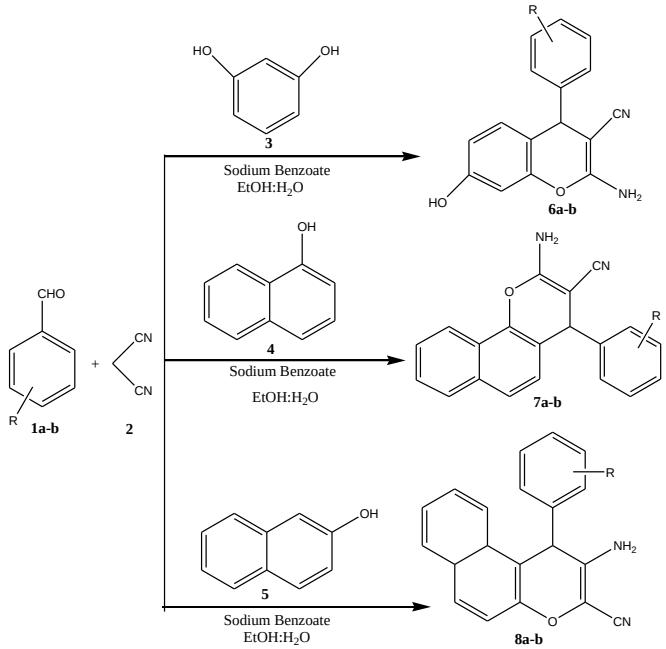
To synthesize the chromene and benzochromene derivatives with the use of salt catalyst i.e sodium benzoate. This is multicomponent reaction This is carried out by using reactants benzaldehyde , malanonitrile and activated phenols like resorcinol, 1-naphthol and 2-naphthol, mixture of ethanol and water is used as a solvent. The synthesis takes place by taking care of environment and use of hazardous solvents, catalysts and chemicals is reduced.



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Paper-15	Heterocyclic Letters 13: iss.-4 (2023), 803-810

An overview of pharmacological studies of *mimosa hamata* (willd.) – a medicinal plant

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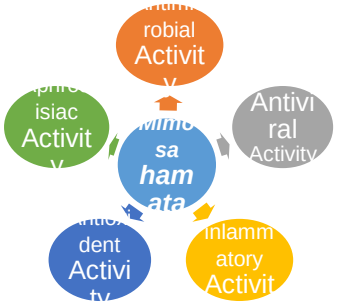
Affiliated by GGSIP University, Delhi.
E Mail : rekhatripathi@msit.in

Mimosa hamata (Willd.) which belongs to family *Mimosaceae* has significant medicinal values. It is a straggling shrub growing on the ridges in various parts of India. Traditionally the extract of this plant is used against urinary complaints and weakness. Leaves have healing effect for glandular swellings and also useful in sinus, sores and piles in the paste form. Contraceptive efficacy exhibited by roots of this plant, while seeds of *M. hamata* are used as a blood purifier. Appreciable pharmacological activities were observed by survey of the literature of this plant like antimicrobial, antiviral, anti-inflammatory, antioxidant and aphrodisiac activities. Triterpenic saponins isolated from roots of this plant also exhibited appreciable potential against microbes. In view of literature study some bioactive principles of *M. hamata* were thoroughly reviewed and discussed. *M. hamata* is a common medicinal plant used in community but very less is known about phytochemical investigations. This review article summarizes the pharmacological and medicinal properties of *M. hamata.*



Paper-16	Heterocyclic Letters 13: iss.-4 (2023), 811-816

Synthesis of novel pyrazoline intermediate as potent pharmaceutical agent

Suresh Dhakhda[b], Girin Baxi[a], Raj Gusai[a], Ashvin Hadiyal[a] and Ajay Rathod[a*]

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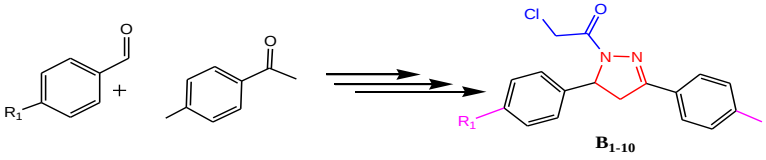
[*]*Corresponding Author: ajayrathod.chem@gmail.com*

The facile synthesis of bioactive derivatives of 2-chloro-1-(5-(phenyl)-4,5-dihydro-3-p-tolylpyrazol-1-yl)ethanone from 4-methyl acetophenone is represented. All novel molecules show good antioxidant activity.



$B_{1\text{-}10}$

[1] NaOH [2] $NH_2NH_2.H_2O$ [3] Chloro acetyl Chloride

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Paper-17 | Heterocyclic Letters 13: iss.-4 (2023), 817-827

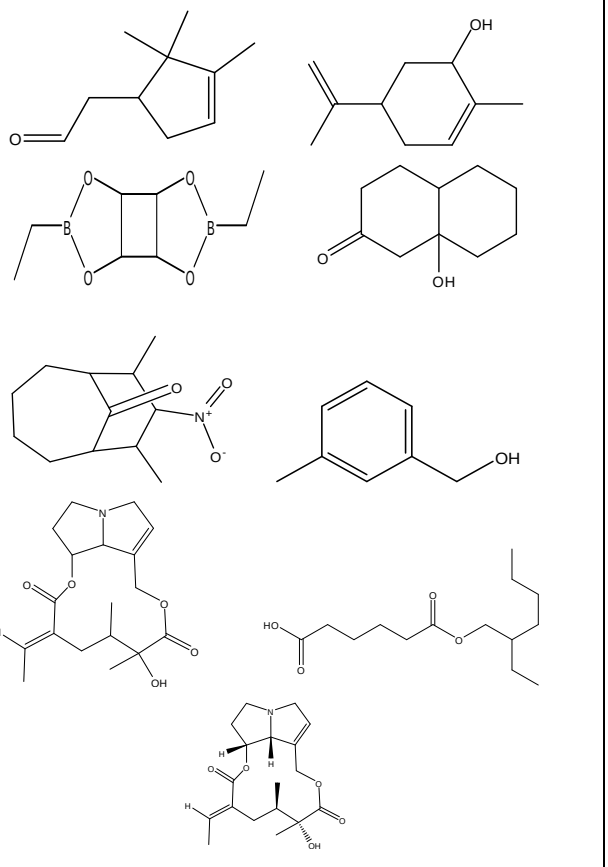
GC-MS analysis and Biological activity of cyclic compounds of dichloromethane extract from *Senecio hoggariensis*

Messaouda ALLAOUI[1,2], Ibtissem BELLAOUEUR[3], Oumelkheir RAHIM[*3,4] and Tarak MEKHELFI[1]

[1] *VPRS Laboratory. University of KASDI Merbah, Ouargla 30000, Algeria.*
[2]*Biogéochimie des Milieux Désertiques, University Kasdi Merbah, Ouargla 30000, Algeria.*
[3]*Scientific and Technical Research Center in Physico-Chemical Analysis (CRAPC), Ouargla 30000, Algeria*
[4]*Pollution & Waste Treatment Laboratory, University Kasdi Merbah, Ouargla 30000, Algeria.*
**Corresponding author E-mail rahioumelkheir@gmailcom*

In the present work, the qualitative phytochemical study of extract dichloromethane of the aerial parts from *Senecio hoggariensis* (*Asteraceae*) was investigated by chromatographic analysis (GC/MS) Separation by gas chromatography - mass spectrometry

Chemical structure



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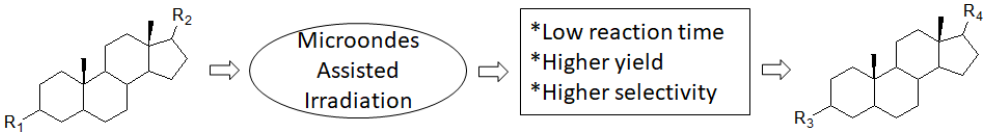
REVIEWS

Review No.1	Heterocyclic Letters 13: iss.-4 (2023), 829-838

A review on the synthesis of steroid derivatives using microwave irradiation methods.

Figueroa-Valverde Lauro[1*], Rosas-Nexticapa Marcela[2], Alvarez-Ramirez Magdalena[2], Ortega-Cervantes Catalina[2], Melgarejo-Gutierrez, Montserrat[3] Mateu-Armand[2], López-Ramos Maria[1], Mijangos-Sánchez Juliette[1].

Laboratory of Pharmaco-Chemistry, Faculty of Chemical Biological Sciences, University Autonomous of Campeche, Av. Agustín Melgar s/n, Col Buenavista C.P. 24039 Campeche, Camp., México.



Review No.2	Heterocyclic Letters 13: iss.-4 (2023), 839-848

Hybrid Antimalarial Drugs; Myth or a Fact: An overview

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